

[SQUEAKING]

[RUSTLING]

[CLICKING]

**NORVIN
RICHARDS:**

All right. Let's progress, then. So last time we got started drawing trees for sentences. I spent a lot of time with verb phrases drawing trees for more and more elaborate verb phrases and ignoring repeated requests that I go ahead and diagram the rest of the sentence already, and I finally did.

So we had sentences like-- I think this was not one of them, but this is like the ones we were talking about-- "She will tickle the child." I said we're going to do the construction of sentences the same way we did the construction of words back when we were doing morphology. We're going to use this operation "merge" which takes pairs of things and puts them together to make new things.

So we'll merge "the" and "child" and get a new thing, which we'll name a noun phrase after the fact that it crucially contains a noun. And we'll merge that noun phrase with the verb "tickle" and that's how we get the verb phrase. And then we have these two other words in here, "she" and "will." And "she" is a noun, a special kind of noun. It's a pronoun.

And "will," I made up a name for "will." I called it a "T." T for tense. Actually, that gives me too much credit. Other people gave it that name, I'm just transmitting to you that name. Yeah. And then we said, if we want to make a tree for the whole sentence, what we'll do is first we'll merge T with the verb phrase.

So we'll merge those two things and we'll give the resulting object the label T. And then we'll merge that new object that we've created with the noun. And since, maybe you remember, "phrase" is just a name for the largest thing with a given label, that daughter of TP that we've got there, "she"-- yeah, it's a noun, but it's now also a noun phrase because it's the highest thing with its label.

That noun phrase and its sister, that T bar, become the daughters of this new node that we've created, TP. I said that's the way we're going to build sentences. Immediately several of you objected. Kateryna here, for example, ruthlessly demanded that I explain why we were doing it in that order and not, for example, like this. We've got "tickle the child" just like before, but this time we'll merge "she" with "will" first. It'd be a projecting T. And then we'll merge the result of that with "tickle the child," giving you a TP again--

[COUGHS]

Excuse me. Giving you a TP again-- that didn't help at all, did it? But with a different constituent structure. Several of you wanted to know, why are we not doing that? Yeah. And I attempted to convince you not to do that with the tools that we have available, the constituent structure tests that we've developed in like a day and a half of syntax. And I was not able to do that because I had not shown you sufficiently sophisticated constituency tests.

So I began on the board showing you another constituency test, and I promised you that today I would use that test to demonstrate that we need the tree on the left and not the tree on the right, and that was a dramatic cliffhanger last time. And then I attempted to distract you from this by talking about other stuff for a little while. That's more or less where we were last time. Yeah?

OK. So now let me attempt to distinctly show you that we should have the tree on the left and the tree on the right. And I should tell you that although I'm going to give you a piece of evidence for that today, the evidence is going to come in in bits over our discussion of syntax, which is going to last a little while. So I'll show you one piece of evidence now and if you don't like that piece of evidence, well, just wait. There will be more.

But what I'm going to do today, thanks to Kateryna, is rush something that I was planning to tell you about much later. So if you don't like what I'm about to do, blame her. This was all her idea. OK? Yeah? OK. So here are some data that we talked about last time. Different sentences, I think, but the same general idea.

Observation. These are both grammatical English sentences: "She would recognize Mary" and "Anyone who knows her would recognize Mary." They're both English sentences. But there's an interesting difference between them. They both contain pronouns and they contain the name Mary, but they differ in that the first sentence, "she" cannot be Mary. It has to be some other person in that first sentence.

So that first sentence has to involve two different people-- one of them female, and Mary is probably also female, though who knows. Maybe not. Yeah? On the other hand, in the second sentence, "Anyone who knows her would recognize Mary," it's possible that "her" refers to Mary. Those were the data that we collectively decided on last time when we were talking about examples like this.

And I showed you the second kind of example partly-- I think somebody hopefully offered me a theory of why the first one was bad. It was the theory I was hoping they would offer where they said, yeah, maybe what's wrong with "She would recognize Mary"-- what's wrong with having "She" refer to Mary is that Mary is later in the sentence.

Pronouns refer to other people, but they have to be people who we've already been talking about or something like that. Totally sensible, reasonable theory. You might expect it to work that way, and it doesn't. The second sentence shows that it's possible for pronouns to refer to things that are later in the sentence. Yeah? Cool.

So how are we going to distinguish these two theories from each other? That was the cliffhanger last time. I said we can distinguish these theories or these examples. So that's just the data I just ran through. "She" is not Mary in the first sentence, but "she" can be Mary in the second sentence. It doesn't have to be, but it can.

All right. Now, I'm going to show you how we'll distinguish those kinds of examples using the tree that I was hoping you would just unthinkingly accept when I built it for you. And then what I'll do is show you that the theory that I'm going to show you for this pair of sentences wouldn't work if we had the other kind of structure. And then if you want, we can talk some about whether there is another way to talk about the other kind of structure.

Now, my abilities as a graphic designer-- you may have picked up on this seeing my slides-- are limited. So I was not able to come up with a way to put all of the trees that you might like to be able to look at all at once on a single slide, so I'm going to put some of them up here on the board instead. We'll see if we can make reference to them.

So she would-- here's the tree that people were offering as an alternative. Yeah. This is the kind of tree that people were offering as an alternative. So the tree that's on the slide is the tree that I want you to believe in. The tree that's on the board is the tree that people said, "Hey, why are we not doing it that way?" Right?

I always feel nervous when I write things on the board that I want you not to believe. So just so we're clear, this is wrong. Not the right tree. That's the right tree, yeah? But I'm now going to try to convince you of that. So the reason it makes me nervous is that I know it's morning, loosely construed.

It's late enough in the semester that you're probably sleep deprived. It's easy to think, well, if the professor wrote it on the board it must be true, yeah? This is not true. At least, I don't think it's true. I'll try to convince you. OK, so that tree up there. If we use that tree up there, we can account for the contrast between the two sentences on the slide--

[COUGH]

My gracious. We can account for the contrast between the two sentences on the slide with the following principle. It goes like this. If you have an NP like "she" that merges with another node-- let's call it alpha-- the NP can't refer to any of the names that are inside alpha, any of the names that are dominated by alpha. I'll keep it specific to names for now. We're going to talk much more about principles like this later.

We're going to develop a theory of what kinds of things pronouns can refer to and what kinds of things they can't. But this works for the pair of examples that we have here. So what's wrong with this example-- why can't "she" refer to Mary in this example? The theory would be it's because you merge "she" with that T bar there, and that T bar dominates "Mary."

And therefore, this principle says "she" can't refer to anything that's inside that T bar and "Mary" is inside that T bar. That's what this principle is meant to do. Let me show you that that distinguishes between the two examples. So if instead we had "anyone who knows her"-- if we had "anyone who knows her" as the subject, "Anyone who knows her would recognize Mary"-- well, I'm going to try to get away without actually telling you how we're going to diagram all of "anyone who knows her."

But "anyone" is the noun in "anyone who knows her," and it's a noun that's modified by what's called a relative clause. So "who knows her" is a kind of clause that modifies nouns. And I have given it the label question mark, question mark because someday we'll talk about relative clauses and talk about what label they ought to have and all that good stuff.

But for now, it's a thing. Yeah. And what's inside it is that pronoun, "her," which got merged. Somewhere inside that relative clause is a verb phrase, "knows," and the noun phrase, "her." So if we ask, what was this noun first merged with? Well, it definitely wasn't merged with T bar. It was merged with something inside the relative clause. It was merged with this verb. Yeah. Yeah?

So this principle that says, if a noun phrase merges with another node, alpha, the noun phrase can't refer to any names that alpha dominates. That distinguishes between "She would recognize Mary," where "she" is merged with something that contains "Mary," and "Anyone who knows her would recognize Mary," where "her" is not merged with something that contains "Mary." Do people see that this principle draws the distinction that we wanted to draw? OK. Giray?

AUDIENCE: [INAUDIBLE] somewhere in the subtree or does it have [INAUDIBLE]?

NORVIN
RICHARDS: No, that's more or less what it means. So trees-- you think of the basic relation in trees as "immediately dominate," so a node immediately dominates the nodes that were merged to create it. And dominate is the transitive closure of immediately dominate.

So you dominate the things you immediately dominate and the things those things immediately dominate, and so on until you run out of immediate domination relations. That's what "dominate" means. To put it more graphically, you dominate the things that are related to you by lines pointing down. That's what this means. Raquel?

AUDIENCE: So did we agree that the "her" in this thing can refer to Mary potentially or are we saying specifically not?

NORVIN
RICHARDS: I asserted that it could.

AUDIENCE: So it's that the NP contains "who knows her" and it's merging with the T bar. The T bar dominates "Mary." Then does that not contradict the new rule we just learned, or is it like the who knows part that combined with?

NORVIN
RICHARDS: Yeah. So here, let me draw "anyone who knows her" a little more carefully. So here's "anyone." Here's the relative clauses that I'm going to continue possibly foolishly not to label, so there's some stuff in here. And then, "who knows her," there's maybe a TP down in there containing a T bar and a T.

And who knows, maybe the subject of it is "who." Right? So somewhere inside-- so there's "anyone" and then there's this relative clause which contains a sentence, "who knows her." That's what relative clauses are. They're a special kind of sentence that acts as a modifier for nouns. So you're right. And then this thing is becoming part of a larger TP.

"Would"-- so now I'm just drawing what's on the slide with a little more detail-- "recognize"-- bless you-- "Mary." So now there are-- apart from "Mary"-- well, OK. There are three noun phrases in this sentence. There's "Mary," there's this thing, and there's this pronoun, "her." Yeah?

And claim, a noun phrase can't refer to something that is contained in the alpha with which the noun phrase merges. So that's a claim that says when we ask, who does "her" refer to here? Can it refer to Mary? The answer is, yeah, because this was merged with "knows." "Knows" doesn't contain "Mary" and so we're all set.

AUDIENCE: So your ancestors merging doesn't impact that?

NORVIN
RICHARDS: Yes. No, you're not responsible for the crimes of your ancestors. That's right. So this noun phrase shouldn't be able to refer to Mary. Yeah? And that might be true. Yeah. Yeah. Yeah? OK, so this has been an attempt at an argument form, argument by successful account. So I've shown you how, with this principle and these trees, the trees that I had on the slide, this kind of tree where a TP contains three things.

There's a T, the sister of the T is the verb phrase, and then the daughter of the TP is the subject of the whole thing. That's the kind of tree that I was drawing you. Or to say that in another way, when you're assembling a sentence out of those three things, what you're doing is you're first merging T with the verb phrase and then you're merging the result of that with a noun phrase. That was the order in which I wanted to do things.

I said, what I've tried to show you is that if we do things in that order we can have an account using this principle that I've just invoked for this contrast between these two sentences, the fact that "she" can't refer to Mary in the first sentence, but that "her" can refer to Mary in the second sentence. So this is, as I said, argument form, argument by successful account.

If you buy these trees then, hey, we get this account of this contrast between these sentences. Yeah? Now suppose we were instead to do this kind of tree. Well, good. But notice at least the principle that I posited here wouldn't work for this kind of tree. So the principle that I've posited here says if a noun phrase is merged with some alpha the noun phrase can't refer to anything inside the alpha.

Well, this noun phrase, "she" has just been merged with the T "would." So that principle at least would not draw this distinction. Possible response could be, yeah, but now we need another principle. To which the response is, yeah, well, what principle? Show it to me.

So what we're going to do is we'll have this tree and we're comparing this tree with-- I'll draw it again-- "Mary," "recognize," "would," and now we're going to have "anyone," blah, blah, blah, "her." So we want this "her" to be able to refer to Mary but we want this "she" not to be able to refer to Mary. So there.

That's part of an argument, anyway, that you should buy the kinds of trees, do the mergers in the order that I wanted you to do them in. We have a name for this relation that holds between "she" and "Mary" in this kind of tree. The relation that holds between a node like the she-- the noun phrase "she" in this tree and another node like the noun phrase "Mary" in this tree, which is contained-- I'm sorry.

This is too complicated. Let me introduce some variables. We have a name for the kind of relation that holds between a node like the noun phrase "she"-- let's call that node x-- and another node that is contained in something that x was merged with. So the relation that holds between "she" and "Mary." Yeah. Or for that matter, between "she" and the verb phrase or between "she" and "would." Yeah?

So the relationship that holds between a node x and everything that's inside the node with which that x was merged. Yeah. That relation is called C command. We're now not going to talk about C command for a little while because, as I said, you're experiencing a moment of anachronism. I'm telling you things that I was planning to tell you in a few weeks but because you demanded it, I'm offering you an argument for this particular way of assembling trees.

Yeah. OK? All right. All right, good. Yes. Alternative way of drawing trees wouldn't let us use this explanation. You would need a different one, and then if you like that alternative way of drawing trees, it's your job to come up with a different one. Kateryna, yes, has already come up with one.

AUDIENCE: I just want to clarify. Does C command refer to that principle that we were talking about?

NORVIN No, I'm sorry. Let me say it better. There's a definition for C command.

RICHARDS:

AUDIENCE: C command is the relationship?

NORVIN
RICHARDS: C command is the relationship. So you say "x C commands y." There are various ways to define C command, but one of them-- here, I'll show you one and then we can talk about another one. You can say "x C commands y if every node that dominates x dominates y," and people usually add "and x does not dominate y."

So this is one way to define it formally. What does that do? It says if you look at the noun phrase "she," what the noun phrase C commands is everything that is dominated by everything that dominates "she," the noun phrase "she." So what dominates the noun phrase "she"? Well, it's just the node TP.

And so "she" C commands everything that's dominated by the node TP, which is basically everything except for TP. So T bar and T and the verb phrase. The T would C commands the verb phrase and also the verb and the noun phrase "Mary." Yeah. To put it yet another way, you C command your sister and everything your sister dominates. That's what C command is.

Lots and lots of syntax makes reference to C command, and so we will keep coming back to it. It's a thing that will come up again. OK? So again, this is all dramatic foreshadowing or anachronism or whatever you want to say-- whatever you want to call it. These are things I was planning to teach you a little bit in the future, and so now you have a jump on in life. Later on some things will suddenly become familiar. Yeah. Yep.

All right, good. I have been teasing you for making me do this but I really appreciate it, actually. It's a real pleasure teaching people who disagree with me all the time. When I'm on airplanes and I can't avoid telling the person next to me what I do for a living and I tell them I teach linguistics at MIT, they're like, oh-- sometimes they say, "Oh, I didn't know they had linguistics at MIT." I'm like, "Yes, yes!"

And then they say, "So what's it like teaching MIT undergrads linguistics?" And I say, "It's great because they all have these math and science backgrounds so they don't believe a word I say. It's terrific. So I go in there and I tell them things and they're like, well, no, show me some proof. I go, well, OK. In another university I think I would be able to get away with just the authority of having a beard this length.

People would just believe me, but no. It's great." OK. This is a slide we saw before. This is just to remind you of a bunch of terminology. Some of it I've been using as we've been talking. So just to remind you, when we're talking about trees, standardly use feminine kinship terms to talk about relations between parts of trees. So we talk about sisters, which are two things that are both-- two things that were merged to form a node.

So for example, the D, "the," and the N, "child," those are sisters. The V, "tickle," and the noun phrase, "the child," those are sisters in this tree. We talk about mothers. So the noun phrase "the child" is the mother of D and N, "the" and "child." We also talk about daughters. So "the" and "child" are the daughters of the noun phrase. And I think I said last time that's it, so we don't talk about grandmothers or aunts or anything else.

And then and this came up when Giday asked a question earlier. The basic relation that's reflected in these trees is the relation of immediate domination. That's the relation that's created by the operation "merge." So when you merge two things, you create a new thing that immediately dominates the two things that you merged. That's just our name for that relation in the tree.

And then there is another notion, dominate, which is the transitive closure of immediately dominate. So you dominate the things that you immediately dominate and the things that those things immediately dominate and so on, all the way down to the tree. And then we said there's this word "constituent," which we've been using for some time, and all of you seem to have a handle on it anyway.

But just to give it a formal definition, we'll say that something is a constituent if there's a single node that dominates all the words in alpha. So "the child" is a constituent because there's a node that dominates just those words, the noun phrase. "Tickle the child" is a constituent because there's a verb phrase dominating just those words. "Will tickle the" is not a constituent because there's no node dominating just those words. Is that clear?

This is all just terminology, and I'm telling you about it because you're going to hear me use it. In fact, you already have. OK. All right? So the way we've been talking, then, we take pairs of things, we merge them to create new things. And we haven't said very much. In fact, we haven't said anything at all about why you pick the particular things that you pick. So I want to talk about that a little bit.

Here are some sentences mostly involving ants, I guess, and anteaters, And they're all grammatical sentences of English, I think. "The ants thrived" and "The anteater arrived"-- this is kind of a little dramatic story about some ants and their difficult lives!-- "The ants thrived." "The anteater arrived." "The anteater devoured the ants."

And "Mary slapped the anteater." A little sad story about ants, or a happy story about an anteater. It depends on whose side you're on, I guess. Yeah? Observation, old observation. Verbs, in lots of languages, maybe all languages, can be fruitfully thought of as coming in at least two types. There are verbs like "thrive" and "arrive" which need to not have objects. So you can say "The ants thrived" or "The anteater arrived."

You cannot say "The ants thrived the ant farm" or "The anteater arrived the anthill." You can't put an object after those kinds of verbs. And then there are other verbs, like "devour" and "slap," that are the opposite. You can say "The anteater devoured the ants." You can't very well say "The anteater devoured." That sentence is not finished. Yeah. So really "Mary slapped the anteater." You can't say "Mary slapped." Did I hear noises of disagreement? Facial expressions of disagreement?

AUDIENCE: "Mary slaps."

NORVIN
RICHARDS: Sorry? Apart from the technical term, yeah. Apart from that. Yeah? OK. So there are verbs that seem to want to have objects and there are verbs that seem to want to not have objects. Classic observation. The name for that classic observation is that there are verbs that are what's called transitive. Those are the verbs that want to have objects, verbs like "devour" and "slap." There are other verbs that are intransitive. Those are verbs like "thrive" and "arrive." I picked these verbs fairly carefully. There are many, many-- possibly most verbs-- that can be either one. So for example, you can say "The anteater ate the ants" and you can also say "The anteater ate." It's fine. Yeah? So some verbs are transitive, others are intransitive. Maybe there are also other verbs that are indecisive. Yeah?

AUDIENCE: In that context, how is "ate" different from "devoured"?

NORVIN
RICHARDS: Good question. Yeah. But I think the fact, the facts are as I just described them, right? That "The anteater devoured" is not a complete sentence, but "The anteater ate" is. "Devoured" and "ate" mean slightly different things.

You have to be louder and messier and more violent if you're devouring, I guess, and "eat" is a more plain vanilla verb. Why that means that one of these verbs has to be transitive and the other doesn't is a really good question. Yeah. Yeah. Other questions? To which I may, again, only be able to say, yeah, that's a good question. Yeah?

AUDIENCE: I was just going to follow up and then say, are we going to answer that question?

NORVIN No. No, no, no. No. No. No, we are not. Other questions? I enjoy listening to your questions even if I can't answer them. OK, so some verbs are transitive, others are intransitive. So that's a classic observation. People have been saying that since the Romans and the Greeks.

RICHARDS: Less classic observation is that there are other kinds of verbs that not only need an object but also need a prepositional phrase. Actually, there are verbs that just need a prepositional phrase. We'll talk about that maybe later, but let's talk for now about a verb like "put." "Put" absolutely has to have an object, so it's transitive in that sense. But it also has to have a prepositional phrase. So you can say "The anteater put the ants onto a plate."

This is a comparatively civilized anteater. But you can't leave out either the object or the prepositional phrase. You can't say "The anteater put the ants." That's not a sentence. And you also cannot say "The anteater put onto a plate." Also not a sentence. So "put" needs to combine with both an object and a preposition. So apparently, in-
- I hope this is what I say on the next slide. Yeah.

Remember when we were talking about what we would need to state in our lexicon about each word or about each morpheme, if we're putting morphemes in our lexicon, which we were saying probably we should? We were saying, yeah, When you list an entry in your lexicon you're going to need to say whether it's a free morpheme or a bound morpheme and whether it's a prefix or a suffix or an infix or whatever all else, and how it's pronounced.

And we spend some time doing phonology and convincing ourselves that saying how something is pronounced might be more complicated than it looks. Here's something else that we're going to have to state. When we list a verb we're going to need to state something about-- this is called selection. So we need to say verbs, for example, select for the kinds of things that they want to combine with.

So our list, our lexical entry for a verb like "devour" has to say, oh yeah, this is a verb that needs to have an object. I think we need to say that. This gets back to your question of a second ago, right? Can we derive it from anything else about the meaning of "devour" that it has to have an object? Can we make that follow from something?

Rather than just having to say next to "devour," oh yeah, this one needs an object. Can that be a general property of certain classes of verbs? That's an ongoing project. There are linguists trying to figure out the answers to questions like that. But yeah, for 24.900 we'll just state for every verb, this verb needs an object. This is kind of like-- and it should look a little familiar--

when we were doing "unlockable" and other polymorphemic words like that we were saying, yeah, there are affixes that say, "I want to combine with a verb," let's say, and "I'll give you an adjective as a result." Similarly, verbs have to specify what they merge with. So the verb "put" is pronounced "put"-- I should really have done that in IPA. It's pronounced whatever. "Put."

And it means something. It means to cause something to be in a place, whatever, however we're going to state its meaning, and it selects for a noun phrase and a prepositional phrase. That's the way we'll say that. So the verb *put* needs to merge with those things. OK? Actually, be a little more specific about how selection works exactly. So I just said-- yeah, is this much clearer so far?

So let's be a little more specific about what selection is and what exactly you're selecting for. I just said there are verbs like *put* that select for an object and also a prepositional phrase. There are also verbs that only select for a prepositional phrase. *Depend* is one of those. So *depend* can combine-- kind of *needs* to combine, it depends, but at least *can* combine with a prepositional phrase, but not just any prepositional phrase. It *needs* to combine with a prepositional phrase in which the preposition is *on*.

You can depend on things. You cannot depend from things or at things or near things or by things. You can't depend near something. That's not how you use the word *depend*. If you learn other languages-- especially if you learn other Indo-European languages because Indo-European languages seem to be especially fond of prepositions, I don't know,

Indo-European languages, the language family that English is part of, we have more prepositions than languages really should-- And if you learn a new language, there's this weird mapping from one language to the next where you just need to learn which prepositions. It's not simple. You don't get to learn "This preposition is the translation for that preposition." You learn things like, "This is the preposition that means 'at' for cities and large islands but for small islands you should use this other preposition instead."

Not to scare you or anything, but if you want to learn other Indo-European languages you should brace yourself for things like that. If you don't want to do things like that, learn a language that's not Indo-European, because outside Indo-European it's mostly like, "Here is our locative preposition. Please use responsibly." But English is an Indo-European language, and so we have stuff like this, verbs like *depend* that say, "I want a prepositional phrase and I want the preposition to be 'on.' Can't be anything else."

So apparently it's possible, at least in some kinds of cases, for a verb to select not just a prepositional phrase, but a prepositional phrase with a particular head. Where by head I mean the preposition-- the thing that the prepositional phrase is named after, the smallest thing with the label P.

So that's the kind of selection you get. There are other imaginable kinds of selection that you don't ever get. So prepositional phrases can be modified by adverbs. So you can say "She put them under the tree." You can also say "She put them right under the tree," "She put them directly under the tree," where those adverbs are modifying the prepositional phrase "under the tree," saying something about the spatial relation between those things and the tree. Yeah?

But we're never going to find a verb that selects for a prepositional phrase. So there are verbs like *depend* that select for a prepositional phrase where the preposition has to be something, like *depend* needs *on*. We're never going to find a verb that selects for a prepositional phrase and it needs to be modified by a certain kind of modifier.

We'll never find a-- I made up a verb, "glorf." Yeah. And "glorf" says, "I need a prepositional phrase. I don't care what the preposition is. You can say 'She glorfed them right under the tree,' 'She glorfed them right through the tree,' 'She glorfed them right beside the tree,' I don't care what the preposition is, but we need 'right' at the beginning of the prepositional phrase." There are no verbs like that in any language. Selection doesn't work that way.

How does selection work? If you're selecting for a prepositional phrase, you're selecting if you have any restrictions on the kind of prepositional phrase you want. They are restrictions of the form "I would like the preposition to be (this)." Sometimes they are restrictions of the form "I would like the preposition to be (this class of prepositions)."

So I might have a slide about this later too. "Put" can combine with a bunch of different prepositional phrases. The preposition can be "under" or "on," "beside," whatever, but you can't say things like "She put them during the party" or "She put them despite the rain." So there are a bunch of prepositions that don't go well with "put." It's basically "put" needs a prepositional phrase that is a location.

So that's a class of prepositions but it's not every imaginable preposition. But there are no verbs-- there's no "glorf," there are no verbs that say, "I want a prepositional phrase. I don't care what the preposition is, but I want it to be modified by 'right,'" or "I want it to be modified by 'directly,'" or even just "I want it to be modified." There aren't verbs like that.

So it looks as though heads, like verbs, get to select for phrases, and they-- this is an old observation of Noam Chomsky's in a '65 book of his. He said, looks like there are all these cases where a verb is not only selecting for a certain kind of phrase, but it's selecting for a certain kind of phrase with a particular head or with the head of a particular class like locative. I want a locative preposition like "put." Yeah? Sound great? OK. Cool.

So once we believe this, once we recognize that this is true, that this is how selection works, that verbs get to select for things they want to merge with-- not just verbs, we'll see. All kinds of things get to select for things that they want to merge with. And if they are picky about the nature of the thing that they merge with, what they are picky about is the head of the thing that they merge with, the thing that the phrase is named after. So the preposition, in the case of a prepositional phrase.

So once we recognize that that's a thing of the "depend on" phenomenon, then we can start using it as a way of looking around for other heads when we see that kind of relation of pickiness. If you have this verb then you had better have this kind of word here. Then we get to suspect that there's a selection relation there because now we know that that's how selection relations work. So here's another example of the same kind. "I think that I have won the lottery." Fine.

That's actually kind of pleasant to think about. "I wonder whether I have won the lottery." Also fine. But "I think whether I have won the lottery." No. I cannot say that. And also "I wonder that I have won the lottery." Cannot say in modern English. There are older versions of English in which you could say things like this. It meant "I am surprised that I have won the lottery."

But in modern English the first two sentences are OK, the second two sentences are bad. Do people agree? Don't let me run roughshod over your English judgments, but I think this is true. So here's another place where there's this relationship of pickiness. So we know that if you have a "depends," you must have a prepositional phrase and the head of the prepositional phrase must be "on."

Here we seem to be seeing that with "think" there can be a clause after it, and then there's a particular word that starts that clause which must be "that" and cannot be "whether." And we're seeing that "wonder" seems to be selecting for the clause that comes after it, and it's picky about the properties of the first word in that clause. It can be "whether" but it cannot be "that."

So here we get to make the move that I foreshadowed. Is that going to go-- we can say maybe this is like "depend" and "on." Maybe "think" is selecting for that clause and maybe that is like "on," so "on" is the head of the prepositional phrase. The prepositional phrase is named after "on." "On" is a preposition. Similarly, we're going to say this clause has, as its head, words like "that" and "whether." We have a name for words like "that" and "whether."

We call them "complementizers," which-- I feel as though I've done a lot of apologizing already for terminology in this class so maybe I'll just stop. That's what we call them. We call them complementizers. Deal. You may have heard them called other things in English classes. "Subordinating conjunctions," they're sometimes called. Try not to get too hung up on that. In this class they are called complementizers. And they have the handy abbreviation C.

So what we'll say is that a verb like "think" selects for CP. So the name we're going to give to this clause that comes after "think," "that I have won the lottery," we're going to call that a CP. Why? Well, because we've seen that this relationship of pickiness holds between "think" and "that" and between "wonder" and "whether," and that entitles us to believe "that" and "whether" are the heads of the phrases that "think" and "wonder" are selecting for. They're like the "on" in "depend on."

Yeah. So that's the reason to draw the trees this way. So we'll say, when you have a clause like "that I have won the lottery" or "whether I have won the lottery," that thing is a CP. "That" or "whether" is its head, and those things are being selected by verbs like "think" or "wonder." Yeah. OK? All right. Those are all complementizers. OK. So are we done with syntax?

We now have this belief in selection which is allowing us to explain why certain pairs of things are merging in the way that they are. So in this example, "I will tickle the child," when we ask why did you merge "tickle" together with the noun phrase "the child," we now have an answer. We get to say, yeah, we did that because "tickle" is a transitive verb.

So if we look up "tickle" in the lexicon the lexicon will tell us, yeah, this is a verb that at least has a use in which it wants to combine with a noun phrase object. So that's why you merged the verb with the noun phrase "the child." And similarly, we might say, yeah, why did we merge the verb phrase together with the T "will"? And we can say something similar.

The T "will" is selecting for a verb phrase. It needs a verb phrase as its sister, and so there. That's why we're merging these two things with each other. So we have beginners of explanations or answers to questions like, why did you merge those things in that order? Why did you merge those two things together? The answer is going to sometimes be, well, because there's a selection relation between those things. OK?

But here's the problem. You can do anything with a feather. So I spent some time telling you there are verbs that need objects and there are verbs that need to not have objects. There are transitive verbs, there are intransitive verbs, and OK, there are verbs that can be either one. And I tried to move us quickly past that class of verbs, but they exist.

So yeah, the child, we know why the child is in there and we think that the relationship between "tickle" and "the child" is a relation of pickiness. There are some verbs that can merge together with an object like that and there are other verbs that can't. But "with a feather" is not like that. You can tickle a child with a feather. You can walk down the street with a feather.

You can stand with a feather. You can dance with a feather. You can do anything with a feather. Prepositional phrase "with a feather"-- you can write your dissertation with a feather if you work hard at it. Prepositional phrase like "with a feather," there's no pickiness involved. It can just combine with anything.

So this does not fall under our generalizations about how selection works. We don't seem to have the kind of relation that we have between the verb and the object. Yeah, there are verbs that want objects and verbs that don't want objects, but we're not going to find a verb that needs "with the feather" in this sense, using a feather. Yeah?

AUDIENCE: Could you almost look at it from a perspective of agency, the fact that you could say "with a feather" but not "with a dog." The dog is able to-- you can't tickle a child with a dog.

NORVIN
RICHARDS: Yeah. Well, it's complicated, right? You can tickle a child with a dog-- well, let's see. The fact that you cannot tickle a child with a dog, if it's a fact, I think is probably a fact about dogs. Right? I mean, so we're in "colorless green ideas" territory here. I was about to do the thing that everybody always does when I show them colorless green ideas where they say, "Well, but if 'colorless' and 'green' meant different things then the sentence would be OK."

And I think tickling a child with a dog, I find myself saying, well, but what if it's a particularly hairy dog? And you grab it and rub it on the child in just the right way, you could imagine maybe being able to-- but yeah. "I will tickle the child with the hammer." Probably you could never tickle the child with a hammer, but this is 24.900 and we don't have to care about that.

So some things are better tickling instruments than others, but thankfully I am not here to educate you about tickling instruments. That'll be somebody else's job, if anybody. Yeah. Not that I'm promising that there is an MIT class where you can learn about tickling instruments. I mean, I suppose there could be, but it's definitely not this one. Yeah. Yeah?

Good. All right. OK. So "with the feather" is another kind of thing. Yeah. This is just saying what I just said. Doesn't seem right to say that "child" or "tickle" selects "with a feather" because you can do anything with a feather and, uh-- there. Yeah. So "I will tickle the child with the feather." "I will devour the child with the feather."

"I will write a novel with the feather." "I will thrive with the feather." You can do anything with the feather. Some of these things are more or less plausible than others, but they're all grammatical. Yeah? Does that sound right? I don't know why I used "devour."

So we said there are verbs like "tickle" and "devour" and "write" that need to have objects, or at least can have objects. And there are other verbs like "thrive" that pickily can't have objects. so not every verb can be followed by the child. I can "tickle the child." I can "devour the child." I can "write the child." But I cannot "thrive the child" no matter how hard I try. Yeah?

AUDIENCE: In the previous slide--

NORVIN Yeah?

RICHARDS:

AUDIENCE: The fact that with something a little bit better [INAUDIBLE] verb. How does that relate to what you said earlier about how verbs select the preposition?

NORVIN So yeah, good. Nice point

RICHARDS:

AUDIENCE: [INAUDIBLE] doesn't work.

NORVIN Yeah. Yeah, Yeah, yeah. That's a good point. So maybe this is a way to say it. If you have a verb and you give that verb everything it needs-- everything it selects, you can always then add "with a feather." So "I will depend on the child with the feather" is fine. You gave "depend" its prepositional phrase that it wanted, "on the child," and then you get to add "with the feather." "With the feather" is desert.

You never need "with the feather," but you can always have it. That's right. And then yes, you're absolutely right. You can't say "I will depend with the feather" because that's a case where "depend" needs a prepositional phrase and it needs the preposition to be "on." But if you give "depend" what it needs, then you may always add "with the feather."

Yeah. It's an optional extra, always. Yeah. Always, modulo-- "modulo"! That's a word I learned in grad school. It means "Always setting aside issues like, wait, what do you mean you will devour the child with the feather? Like, how are you-- what? How are you going to do that?"

So some of these things it's not so clear what exactly-- or "I will thrive with the feather." Maybe that means something. I will live a long and happy life as long as I have the feather. So we're back to "colorless green ideas" territory, more or less. We're not in the business of trying to figure out which of these sentences make sense. We're in the business of trying to figure out which of them are grammatical, and they're all grammatical. That's all I'm asserting. Yeah?

AUDIENCE: [INAUDIBLE] "...with this feather." Does "with this feather" modify "the child" or "tickle"?

NORVIN Yes. To which the answer is yes. You're right. So it's ambiguous. It can have either of those structures and either of those meanings. Yeah. So good point. So "I will tickle the child with the feather" could mean-- I think we talked about this in class-- I will use the feather to tickle the child, or I will tickle, possibly with my fingers, the child who has a feather.

That's absolutely right. But "with the feather" doesn't-- so "with the feather," yeah, it's even more adaptable than I made it sound. It can combine with noun phrases and with verb phrases, and it can always combine with noun phrases. Concentrate on that reading where it's the child who has the feather, "I can tickle a child with a feather."

I can tickle an adult with a feather, I can tickle a dog with a feather, I can tickle an orange with a feather-- would be hard, but it's grammatical. Yeah. Yeah. Yeah? So "with a feather"-- anything can have a feather, and you can always use a feather to do anything. That's the moral of all this. OK? People are leaving. Was it all the talk about devouring children?

AUDIENCE: People are leaving.

NORVIN Sorry?

RICHARDS:

AUDIENCE: I was trying to come up with something that wouldn't depend on this feather.

NORVIN "With this feather"? No. So. "Who are you with this feather?" "I am far, far more impressive with this feather."

RICHARDS: Yeah. Yeah. Yeah? OK. All right. So you can do anything with the feather. And conversely, so "with a feather" can combine with anything-- maybe not conversely. "With a feather" can combine with anything.

Objects can't combine with just anything. You have to pick a verb that is transitive or at least can be transitive. So you can "tickle a child." You can "devour a child." You can "write a child." You cannot "thrive a child." So if you pick an intransitive verb then you can't combine it with a direct object. So there's a selection relation between the verb and its object. That's what we were just talking about.

We have to look up verbs like "tickle" and "devour" and "write" in the lexicon and find out whether they can combine with objects or not, but we'll never have to look anything up to know whether you can add "with a feather." You can just always add "with a feather." Yeah? So yes, when we're building trees we're going to have selection relations that sometimes tell us, yeah, if we have, say, this kind of verb, we'd better have this kind of phrase combining with it. We have "devour." It had better combine with an object. Something has to get devoured.

But then there are going to be other kinds of things like "with a feather" that are just always options. You can always put them in. Another terminology break. We call things that are selected arguments. So "the child" is an argument of the verb "tickle," in this example, and we call phrases that don't seem to be selected by anything, we call those adjuncts. Just the name for those things.

Here we have to be careful. This is a point where people get confused sometimes. So let me see if I can say this. Knowing me, I will probably say this several different ways and we'll just see if I manage to say it in a way that makes it make sense because people get confused about this.

Arguments. Here's a way to think about it. Arguments, like direct objects, arguments are picky about which heads they can combine with. So if you're asking, should I put in a noun phrase object for this verb? Well, you've got to know what the verb is, whether it's a transitive verb or an intransitive verb. Adjuncts are not. So adjuncts like "with a feather" can combine with anything.

There's no selection, really. You don't have to look anything up to find out whether you can merge "with a feather." The confusion comes in like this. The problem is there are optional arguments.

So I flagged this earlier. There are verbs that are transitive and there are verbs that are intransitive, and in the earlier slides where I was talking about transitivity I tried to concentrate on verbs that were comfortable in their identity as either transitive verbs or intransitive verbs, but there are many, many verbs that can be either one. So you can "dance" or you can "dance a hornpipe."

Here's the thing. So you can "dance" or you can "dance a hornpipe," but when you "dance a hornpipe," "a hornpipe" is an argument of "dance" because you have to know whether the verb can be a transitive verb to know whether there can be a noun phrase there. The confusion comes in. People look at sentences like "I will devour the child with the feather."

Let's make it "tickle." "I will tickle the child with the feather." Syntacticians are the kind of people for whom "I will devour the child with a feather" and "I will tickle the child with the feather" are basically the same sentence. We're just not interested in the differences between those. They're basically the same. People look at that and they go-- well, maybe I want it to be "devour." No, we can stick with "tickle."

So what we say is this is an argument and this is an adjunct. To say that this is an argument is to say that whether it can be there or not is determined by what verb you've got, whether the verb is transitive or not. To say that this is an adjunct is to say that I don't care what the verb is when I decide whether to put that in or not. What people get confused by is this. Adjuncts are pretty typically optional.

You can tickle a child with a feather. You don't have to, you can just tickle a child. There's never a requirement that an adjunct be there. And so this is one of those tests for whether you're looking at an argument or an adjunct that only works in one direction. If it's an adjunct it had better be optional. But if it's optional, it could be an adjunct or it could be a hornpipe. It could be an object, in these kinds of examples, that's combining with the kind of verb that can be either transitive or intransitive.

So if you're looking at a phrase and you're saying to yourself "This phrase is optional," you're not then entitled to guess that it's an adjunct, necessarily. You only get to find out that it's an adjunct by asking yourself, will it matter what verb I have, let's say? Or what noun I have, depending on what you're combining it with. OK? Is that clear? Have I said it in enough different ways, Faith?

AUDIENCE: Is this at all complicated if you treat the feather as, like, an animate entity? So if you were to actually [INAUDIBLE] a person and you would say, I danced with the feather. Would it mean you're dancing-- like, is that [INAUDIBLE]?

NORVIN
RICHARDS: Oh. Oh. Oh. Oh. Oh. Oh. Oh, dear. Well, let's reluctantly put feathers aside for a second and talk about something that we know is animate, like children. So you can dance with the child. You can play games with the child. You can eat lunch with the child. "With the child" is probably still an adjunct in that kind of reading.

So "with the feather"-- you're raising a good point that with in English-- I was warning you about Indo-European prepositions. "With" can mean two subtly different things, right? So you're pointing out that if I tickle a child with a feather, I'm using the feather as an instrument for what I'm going to do. If I have lunch with a feather-- if I have lunch with a child, then that "with" is introducing somebody who is doing something together with me, right?

We're both doing the activity in the verb frames. So those are maybe two different "with"s, but they're both ad-- those two prepositional phrases, they're probably both adjuncts. And "I will dance with the feather," I guess, could have either reading in principle. Yeah. Yeah. Yeah. Yeah? Cool. Nice example. OK.

OK, so that's the distinction between arguments and adjuncts. Why are we bothering to distinguish arguments and adjuncts? Well, there are various places where they behave differently in interesting ways. So take a sentence like "I decided on the boat." That can mean a couple of different things. Somebody tell me something that it can mean.

AUDIENCE: I made the decision on the boat.

NORVIN Sorry?

RICHARDS:

AUDIENCE: I made the decision while I was on.

NORVIN "I made the decision while I was on the boat." That's one thing it can mean. What's the other thing?

RICHARDS:

AUDIENCE: "I was a boat dealer and I was picking between two different boats and I decided on this one."

NORVIN Yeah. Yeah, yeah, yeah. So I was deciding between a boat and something else. You know, am I going to buy-- or
RICHARDS: maybe I was deciding between two different boats and I decided on the boat. I decided on the big black boat instead of the small white boat. Yeah. Whatever. Yeah. Or I decided on the boat rather than the motorcycle. I was deciding what to spend my lottery money on. Yeah. Yeah. It can mean either of those things.

Maybe the next slide will do this and I won't have to mess with the blackboard. Yes. So those are the two readings, actually, in the same order that we got them. Faith's reading, which is the first one, I made my decision while I was on the boat. And then Joseph's reading, I chose the boat. It can mean either of those things. Is "on the boat" an argument or an adjunct? Given what we've said about arguments and adjuncts.

AUDIENCE: It depends on the meaning that you intend.

NORVIN Yes. Yes. The answer to that question is yes. Is it an argument or adjunct? Yes. Yes, it is. Yeah. Suppose we take
RICHARDS: the first reading for "on the boat." So I made my decision while I was on the boat. Is that an argument or an adjunct, that version of on the boat?

AUDIENCE: Adjunct.

NORVIN It's an adjunct. You can do anything on a boat. Sleep on a boat. Write your dissertation on a boat. Lots of things
RICHARDS: you can do on a boat. On a boat can combine with all kinds of things. But the second reading where I decided on the boat ends up meaning "I chose the boat," that's kind of an idiosyncratic fact about "decide" and "on," right? That "decide" and "on" can squash together to mean "choose." Right? You can't do this even with other expressions that more or less mean "decide."

You can't say "I made up my mind on the boat" and mean "I chose the boat," I don't think. Right? And you certainly can't combine "on the boat" with any random verb and expect to get a new meaning. That's not the way life works. So there's an adjunct meaning of "on the boat" and there's an argument meaning of "on the boat." OK. Cool. Now, yeah, is it an argument or adjunct? Yes. So the first one is an adjunct, the second one is an argument. Good.

Consider a sentence like, "I decided on the boat on the plane." Please, while you're considering the sentence, do not think about cases where boats are on planes or planes are on boats. There are planes that are also boats-- I've been teaching this class to MIT undergrads for a while. I know the kinds of moves that you are thinking about even now. So just consider cases where-- so the imaginable things that it could mean given those two readings for "on the boat."

I think there are two. It could mean, "While I was on the plane I chose the boat," or it could mean "While I was on the boat I chose the plane." Yeah? In principle it ought to be able to mean either of those things. Can it mean both of those things?

AUDIENCE: [INAUDIBLE], but I just-- I decided on the boat on the plane. Like, deciding on the plane on the boat sounds much weirder.

NORVIN Yeah. Here, I'll tell you what. Let me write these readings down just so we can point at them as we're talking
RICHARDS: because otherwise I can tell we're going to get confused. I'm already confused and we've only just started. So one reading is "I chose the boat while I was on the plane." The other is "I chose the plane while I was on the boat."

Is that legible at all? Can you read that, any of you? Yes? Sort of? Kind of? OK, good. So those are the two readings. Call them reading one and reading two, or we could call them the "choose the boat" reading and the "choose the plane" reading. And now we're trying to figure out which of those things can this mean. Kate?

AUDIENCE: OK. So instinctively I chose reading one because the boat just-- I don't know. That feels like it makes sense. But then I thought, if you work hard enough to make sense, especially if you were to replace the second prepositional phrase with something more simple, like "at lunch"--

NORVIN Oh.
RICHARDS:

AUDIENCE: In [? formal, ?] or yesterday, I guess, which isn't-- I don't know. [INAUDIBLE]. But "I decided on the boat at lunch" makes sense. You still have essentially the same content.

NORVIN Yes. Yes. So that's a nice point. Let me react to it by attempting to squash it. So don't change either of the
RICHARDS: prepositional phrases into anything else. But we are going to want to come back to that because that's a nice point that you're making.

I think if I say "I decided on the boat at lunch," that we're back to the original ambiguity. Is that your feeling? That that can mean either I chose the boat at lunch or I decided while I was on the boat at lunch. Is that true, do you think?

AUDIENCE: I just got lost.

NORVIN
RICHARDS: Me too. Me too. So yeah, stick to these prepositions or these prepositions. That sentence, we're trying to figure out what that sentence can mean. What can that sentence mean? Yeah?

AUDIENCE: I think the first one would be more usual in the sense that if you tried to-- I mean, I know you told us not to replace anything, but--

NORVIN
RICHARDS: It's all right.

AUDIENCE: If you do try to replace "on the boat" with another adjunct, I don't know, like "the building," it would be a little weird. It would pass off as something-- I would pass it off as something that you could say, but I wouldn't quite say it and it sounds super weird to say. Like, "I decided in the building on the plane"? Is this clearly deciding on the plane? Decide on the plane, but it sounds weird because "decided on" should be kind of better.

NORVIN
RICHARDS: OK, so now we've had two votes for changing some of the prepositions, so I'll stop fighting it. We could also be thinking about, "I decided in the building on the boat." Is this grammatical? Sort of? Yeah? Yeah?

And does this mean I chose the boat while it was in the building? It can. Yeah. I guess it's hard for me to be both in a building and on a boat unless the building is on the boat or the boat is on the building. Yeah. Many, many hands. Yes?

AUDIENCE: Yeah. My thinking was that when the prepositional phrase is in argument, it's more attached to the verb by association. So it kind of makes less sense to split in the middle. So that sentence that you put below there doesn't quite go as well, and so that's why choosing the boat on the plane makes more sense.

NORVIN
RICHARDS: OK. Cool. So actually, what you just said and what Faith just said and what you just said a second ago, these dovetail nicely, I think. Let me now try to summarize something that I think all three of you said. Maybe we can say it like this. When I asked, can this mean "I chose the boat while it was in the building"? Everybody was like, nah. I think it can, but for me I have to pronounce it in a particular way.

So I can say "I decided, in the building, on the boat." I think that's the easiest way for me to say it and have it mean that. So I did something fancy with my voice there that involved trying to hide this prepositional phrase. Yeah. It's sometimes called a parenthetical where you put in these things in strange places. There's lots of interesting work on parentheticals.

So one thing that all of you are teaching us, maybe, is that it's dangerous for me to just show you these words on this slide and ask you what they mean. What I should really do is pronounce the sentence at you. So when you're asking yourself how many things can this mean, don't ask yourself what "I decided, on the boat, on the plane" means.

Ask yourself, what does "I decided on the boat on the plane" mean? Should I do that again? How many of you think that it can mean number one? "I decided on the boat on the plane." How many of you think that it can mean number two? Is there anybody who thinks that it can mean number two and cannot mean number one? Is there anybody who thinks that it can mean number one and cannot mean number two?

OK. So through the power of democracy we've come to the conclusion that it can mean number one and can't mean number two, except for a couple of you who feel that it can mean either one. Yeah? I think the ones who feel that it can mean either one are ones who maybe have ways of doing parentheticals that are less dramatic than I just did, this process of hiding a prepositional phrase.

Because I agree that you can say "I decided"-- see if you agree-- "I decided on the boat on the plane" can mean "I chose the plane while I was on the boat." I have to say that in a particular way, play those games with pitch as I speak. Lots of interesting questions about what the heck I am doing when I do that. Yeah, you had a question a while ago. Sorry. Yep, you.

AUDIENCE: What do you think about the sentence "I, in the building, decided on the boat."

NORVIN Whoa. "I, in the building, decided on the boat." You asked this question before. You're the guy who likes to modify
RICHARDS: pronouns with prepositional phrases. What's your name?

AUDIENCE: I'm the guy who likes to modify pronouns--

NORVIN OK, that's your name. OK, the guy who likes-- do you have a nickname? "Guy." We'll call you "Guy." Cool. So I, in
RICHARDS: the building, decided on the boat. Hey, you think I could do that? Yeah? Then we have the problem that if I'm in the building I can't also be on a boat unless really unlikely things are happening. Right?

Unless there's a building on a boat or a boat on a building or something like that. And so you're kind of biased in favor of the reading where I chose the boat because we've also said that I'm in the building, thanks to the prepositional phrase that you're named after, the one that modifies the pronoun. That's a nice example. Faith?

AUDIENCE: Don't we have something similar that happens if you say, "I decided to run on the boat?" Because either you're running on the boat or you're deciding to run for president-- I don't know. Campaign while you're on the boat.

NORVIN Yeah. Yeah. "I decided to run on the boat." That's a nice example. Yeah, so I decided to run for president or I
RICHARDS: decided to be in the marathon while I was on the boat, or I decided, "Here's a fun thing I'll do. I'll run on the boat." Yeah. Right. Those are good examples where-- actually, all of these are examples where-- yeah, let me back up. So "I decided on the boat on the plane."

Through the power of democracy we've come to the conclusion that that means number one. What that means is there are two places for on the boat for prepositional phrases to be. There's the place where it gets to be an argument and there's the place where it gets to be an adjunct. Right? And the place where it gets to be an argument is closer to the verb. Several of you said this, right?

So if it's right after the verb it gets to be an argument, and if it's not right after the verb then it needs to be an adjunct. And in simple sentences, like "I decided on the boat," you don't know where it is. So you don't know whether it's in the argument place or the adjunct place, and so the example is ambiguous. It's kind of like the ambiguity of "I will tickle the child with the feather," where you don't know whether "with the feather" modifies "the child" or the verb phrase "tickled the child."

Or, and now this is why finally I'm becoming relevant to what you just said, Faith, that's another example where "on the boat," it's ambiguous where you put. It could be a couple different places in the structure and it could modify different things. Yeah. So we're getting these ambiguities. And the fact that these ambiguities disappear if you pile these prepositional phrases up disappear for most of us. Some of you are more creative with prepositional phrases. Kateryna, for example, has great prepositional phrases-- go ahead.

AUDIENCE: Is there a reason why we're ignoring the intonation angle? Is this like a competence versus performance situation?

NORVIN No. No. No. This is more a let's start with imagining that there's no wind resistance when we're doing physics,
RICHARDS: right? This is a, yeah, that's a really interesting complication, which we need to study what the heck is going on with intonation. But we're going to start by developing a theory of English sentences in which nothing interesting is happening with intonation. And then because this is 24.900 we will probably never get out of that. But intonation is a fascinating topic that you then go try to add to your model. Yeah. Yes?

AUDIENCE: So to correctly write sentence two and the sentence below, would you put commas around--

NORVIN Oh, yeah.

RICHARDS:

AUDIENCE: --"on the boat"?

NORVIN Oh, I see. So yes, if we-- you mean the string "I decided on the boat on the plane," if we wanted it to have reading
RICHARDS: two? Yeah, commas are one way that you indicate the special intonation that makes this possible. So commas-- no language, actually, has a very good way to indicate intonation. It's not something that we're good at spelling, but punctuation marks are one of the things we do to do that. Yeah. Nice point. Raquel?

AUDIENCE: I was thinking that the rule that you were saying about the number one being the preferred computation. It makes a lot of sense in that the-- if there was going to be a situation where a thought two sounded correct, I think it would have to be something where the adjunct sounds like it needs to come really close to the verb decide on a whim. If you said, "I decided on a whim on the boat," I feel like I would be more likely to say that made sense than "I decided on the boat on the plane" because I need to hear and decide on a whim.

NORVIN Yeah. That's a very nice point and a really nice example. I mean maybe-- so I think the next slide is going to echo
RICHARDS: a version of that. What we're seeing is-- so here I've got an idealized version of the judgments that we more or less got. There are some people for whom you can get either reading. Interestingly, nobody has the opposite judgment, that "I decided on the boat on the plane" preferentially means "I chose the plane while I was on the boat."

And what we're seeing then is that if you have-- so one difference between arguments and adjuncts, the reason that I introduced you to them, is that arguments are picky about which heads they can combine with and adjuncts are not. You can do anything with a feather but something like a direct object, you have to look at the verb to see whether you have it or not.

And what we're also seeing is that if you have a head that has both an argument and an adjunct, and that's the "decide on the boat on the plane" thing, then the argument is closer to the head. So far, yeah? And this connects with Raquel was just saying. One way to think about it, maybe, is to say, if you have these two prepositional phrases and you have this verb and you're trying to decide, in what order shall I merge these things with each other? Apparently the answer is, well, first, see what the verb would like you to do.

So if the verb needs something, then satisfy the needs of the verb first and then fool around with adjuncts. Yes. You can do adjuncts later. And Raquel's making the point that there are various things in life that verbs could need and we have to develop a theory of all of them, and today we haven't. Yep. Any questions about any of this?

I think, if I remember right, this might be a good place to pause and see what I was going to do next. Yes, no. So we're about to do another test for arguments and adjuncts. And we will do it, but we'll do it next time where "next time" is not next week, but the week after, right? Because you guys have to go break spring. So have a great spring break, everybody. Go do something relaxing, and we will see you again in a couple weeks.