[SQUEAKER]

[SQUEAK]

[SQUEAKIN]

NORVIN RICHARDS: I'm going to start today with a little bit of a review of something that we talked about sort of earlier when we were doing syntax because it came in handy. At a certain point, you guys were pushing me with questions about the fine details of syntactic structures. And I wasn't able to answer your questions without making reference to another kind of test for syntactic structure, which was binding theory.

And so I showed you binding theory back then, but I'm going to go over it again in a little more detail. And we'll talk about some things that we didn't get a chance to talk about last time. And then we'll go on from there.

Binding theory is the theory that's meant to handle facts like the facts that are on this slide, namely, the fact that, if you say that these are both grammatical sentences, but that they mean different things. The first one, "Susan likes herself," you could paraphrase as "Susan likes Susan." "Herself" has to refer to Susan.

And possibly relatedly, "Susan likes her." You don't know who "her" is. But you do one thing, which is that it is not Susan. That's not a general fact about "her." It's a fact about "her" in this sentence. So if I said "I like her," then "her" could be Susan, whoever Susan is. But if it's "Susan likes her," then that "her" cannot be Susan, or at least not the same Susan as the subject, yeah?

Binding theory is meant to capture facts like this. And these starred sentences incorporate some of the things that I just said, not only-- so these little letters, these subscripts that people put on these words, are meant to indicate things about what can corefer with what. So "Susan likes herself," the first sentence, is OK.

And the third sentence is starred. Because if you say the string "Susan likes herself," then "Susan" and "herself" have to refer to the same person. And we indicate that by giving them the same subscript.

So "Susan" sub a likes "herself" sub a, that's OK. But "Susan" sub a likes "herself" sub b is not OK. The two subscripts have to be the same. And with a pronoun, it's the other way around. They have to be different.

OK so far? Nobody is sitting there quietly thinking, "No, wait. I say 'Susan likes her,' and I mean 'Susan likes herself' all the time. No wonder nobody ever understands me." Nobody's having that experience? OK, good.

So, you know, looking at this without thinking about it too hard, we could think, OK, maybe pronouns-- we'll use "pronoun" to refer to words like "her"-- cannot corefer with anything in the sentence, where "corefer" means refer to the same person. And anaphors, which is a name for fancy words like "herself," must corefer with something. So "Susan likes herself, herself" needs to refer back to Susan. You have to give "herself" something for it to corefer with.

And when we did binding theory before, we already got this far. A word like "herself" has this special property that it has to corefer with something else in the sentence. But interesting fact, it can't just refer with anything. And this is why there's a theory. You have to do some work to figure out which kinds of things it can refer to.

So "Susan likes herself" is fine, but "Susan's father likes herself," where "herself" is Susan, is no good. One hopes that Susan's father likes Susan, but this is not the way to say it. So "herself" can't refer back to Susan in a sentence like this, which knocks out some of the simplest, easiest theories you might have had from the first batch of sentences on the earlier slide.

You might have thought, well, you know, anaphors, they need to refer back to something. And you might even have thought they have to refer back to something that's earlier in the sentence. They're kind of a pointer that points back to something that's before them. And what we're seeing is that it's more complicated than that. They can't just pick out anything.

There are some restrictions on what they can refer to. We have to understand what those are. There's a classic story, which we've already been through-- I'll just show it to you again-- about why it's OK to say "Susan must like herself," but bad to say "Susan's father must like herself." The classic story goes like this.

What we're trying to do is come up with a structural relationship between "Susan" and "herself" that holds in the tree in the left, but not in the tree in the right. We're talking about structural relationships because, well, your first hope, which might have been, yeah, "herself" has to refer to something that's been mentioned before, the way you might have hoped language was designed, there are no languages like that. There are, instead, languages like this that apparently care about trees when they're deciding which things can refer to which other things.

And so we're going to try to develop a structural distinction between the relationship between "Susan" and "herself" in the tree on the left and the relationship between "Susan" and "herself" in the tree on the right. As I said, we've talked about this before. We're just reviewing it.

The story that people have classically come up with makes use of the fact that Susan is more deeply buried in the tree on the right than she is on the left. So there's a relation called c-command. It's a relation that can hold between two nodes in a tree. It says alpha c-commands beta if every node that dominates alpha dominates beta.

So you c-command basically the thing that you were merged with and everything that that dominates. So in this tree, the NP "Susan" c-commands "herself." The way we find that out is we ask, what are the nodes that dominate the noun phrase "Susan"? And there's only one, that TP that I've put up there. And that TP also dominates "herself," and so "Susan" c-commands "herself."

Does "herself" c-command "Susan"? No. Yeah, you're all shaking your heads appropriately, right? And the way to find that out is to ask, what are the nodes that dominate herself? And they include that TP, but somebody name another one that doesn't dominate "Susan."

AUDIENCE: VP.

NORVIN RICHARDS: VP, yeah. Or T bar, yeah? So there are at least those two which dominate "herself," but don't dominate "Susan." So "Susan" c-commands "herself," but "herself" doesn't c-command "Susan."

And what we're seeing is that maybe an anaphor needs to refer to something that c-commands it. So in this sentence, "Susan" must like herself," "herself" is referring to Susan. And "Susan" c-commands "herself," as opposed to the other tree, "Susan's father must like herself," which is no good.

What's wrong with it? Well, what's wrong with it is, on this story, there are multiple nodes dominating "Susan." There's TP, but also NP and DP. And some of those don't dominate "herself." So "Susan" doesn't c-command "herself." Binding theory makes use of this.

Let me just call your attention-- maybe your attention is already firmly fixed on this-- to how weird this is. I just alluded to this, but let me just say it again. I'm showing you a bunch of facts about English. And different languages do have different anaphors that behave in different ways. But here's something no language ever does, as far as I know.

There are languages in the world where an anaphor can refer to anything that was said earlier. There are no languages in which both "Susan likes herself" and "Susan's father likes herself," in which they're both OK. There just aren't any languages like that in which the important thing is does the noun precede the anaphor, which is, so first of all, interesting. There aren't any languages like that.

But second of all, weirdly, surprisingly, interesting, let's get ourselves in the frame of mind where we can be impressed by a fact like that. Because, look, imagine what you were like when you were a baby, right? Here you are. You've just been born. You're hearing people speak, right?

They're saying sentences in this language that's going to be your native language, and you're trying to learn it. You're trying to figure things out about it. What's the one thing that you know? You hear people talking. And they're saying things like-- here, I'll put a sentence on the board in a language that I hope none of you speak.

So here's a sentence. You hear one of your parents saying, [NON-ENGLISH SPEECH].

Maybe they write it down and show it to you. So you know, for some reason, that it's 1, 2, 3, 4, 5 words long. What else do you know about that sentence?

Do you know which words in that sentence c-command which other words? Good lord, no. Yeah? Do you know which words in that sentence precede which other words? Yeah.

So you know that [NON-ENGLISH] precedes [NON-ENGLISH]. You know that. But you don't know whether [NON-ENGLISH] c-commands [NON-ENGLISH] or not. So the one bit of information that you have immediately from the get-go, which words come before which other words, you ignore.

So languages don't ever make use of that when they're doing binding theory. So you would have thought this one sort of easy to access bit of information that all of us have from day one, no matter, you know-- don't know anything else about your language. You at least know which things come before which other things. Binding theory never, ever cares about that.

It only cares about c-commands, which is this thing that you have to know something in order to understand. It's as though our brains are designed to build language in some ways and not others and to ignore certain sources of data which are very, very fruitful. You have lots and lots of data about which things precede which other things, but you don't care. It's kind of interesting. Yeah.

AUDIENCE: If, for some reason, we did care about the order of the words that we're saying, would that create ambiguity? Because some languages like, German, half of it is head initial and half is head final. And so you'd be confused.

NORVIN RICHARDS: So which things proceed and follow which other things? I mean, there are ambiguities in binding theory. We've been talking about simple sentences so far, but you can say things like-- if anybody is wondering, this [NON-ENGLISH]. It means "Is drinking the man the water," so "The man is drinking the water." Sorry, I just told you that so you wouldn't have to worry about that.

There are ambiguities in binding theory. I've been talking about sentences where there aren't ambiguities, but you can say things like "Susan told Stacy about herself," where probably the easiest reading for that is that Susan told Stacy about Susan. But if Stacy is unclear about herself, there's something Stacy doesn't know about herself, Susan could tell Stacy about herself and have that mean Susan told Stacy about Stacy, I think.

Am I making that up? I think that's true. This is just ambiguous. So here's a sentence. So we're OK with ambiguity usually. There are plenty of places where, if we were to draw a tree for this, we'd want to draw a tree where "Susan" and "Stacy" both c-command "herself." And so it has a choice of which kind of thing it wants to refer to. All it cares about is which thing c-commands it, but it doesn't care about which thing precedes it in any language on Earth. It was kind of interesting. Yeah, go.

AUDIENCE: I was also thinking about you could have something like "Carrie likes Mary herself." Maybe Mary played the evil character on TV and people don't like-- she likes Mary herself.

NORVIN RICHARDS: Right, right.

AUDIENCE: But it's like, all the other people, they hate Mary. But she, herself, she likes--

NORVIN RICHARDS: She-- yeah. You're raising-- actually, I'm glad you asked that question because it raises a good point, which I should have made. And so thank you for raising it, which is that languages use "herself," "himself," "myself," all these "-self" kinds of doohickeys, for a bunch of different things. We're going to be concentrating on the "herself" that sits where a noun phrase would normally sit and refers back to another noun phrase.

But there is this other, sometimes called, an intensive use of reflexives. And I can't spell today-- intensive, where you say things like "John, himself, fixed the computer," or, for that matter, "John fixed the computer himself," where that means something not so different from "John fixed the computer." It means something like "John fixed the computer, and no one else did."

So "Susan's father must like herself." We were talking about things that "herself" can refer to. Or "Susan told Stacy about herself." We're talking about things that "herself" can refer to.

This would be an OK sentence if you changed "herself" to something else. It would mean something else. But "Susan told Stacy about Mary," that's also a sentence, right? So "herself" is just a noun phrase, noun phrase with special properties, that's sitting where noun phrases go.

If you replaced "himself" here with something else, so if it were "John, Mary fixed the computer," you would no longer be speaking English. So this is a different construction, the construction that you're raising, a really interesting one which I'm now going to ignore for the rest of today. But that's what this is. Yeah.

AUDIENCE: Well, I'm bringing this again.

NORVIN RICHARDS:	Oh, no. I'm ignoring you. No, sorry. Go ahead.
AUDIENCE:	Is that a type of movement?
NORVIN RICHARDS:	Sorry?
AUDIENCE:	Is that another example of movement? Or--
NORVIN RICHARDS:	Which one? Oh, the fact that himself can be either here or here?
AUDIENCE:	Yeah.
NORVIN RICHARDS:	Maybe. Ah, we have to be careful. There are various kinds of-- so himself, here, it's kind of like an adverb, right? It's modifying the way in which he fixed the computer. And just as you can see things like "John quickly"-- I don't know why I switched to John here. Let's make Susan do this, too.
	Just as you can say Susan quickly fixed the computer, or Susan fixed the computer quickly, you could do that with movement. Or you could decide-- we're learning something about adverbs, that adverbs, because it's an adjunct maybe, there are more options about where it can go. The rules about where exactly it goes are not as strict.
	The clean arguments for movement are cases where we know for a fact that something should be here, and yet it's over here. When we do "What did he devour?" that's what we're doing there. Yes?
AUDIENCE:	But doesn't the "you" in that sentence kind of change depending on where you put the "herself"?
NORVIN RICHARDS:	Oh, sometimes. Yeah.
AUDIENCE:	The first one, you could have "herself" after Susan if you're implying that it's surprising that Susan, herself, was the one who fixed the computer.
NORVIN RICHARDS:	Yeah.
AUDIENCE:	Or as you put it at the end, it's you just say that it was Susan that--
NORVIN RICHARDS:	Yeah, so these might be different kinds of adverbs. That's a very good point. Yeah, that's a very nice point. So if I say "Susan, herself, fixed the computer," we mean Susan is the CEO of the company.
	You would have expected her to hire someone else to do it, but she did it herself, whereas "Susan fixed the computer herself," it doesn't mean necessarily that it's surprising that she did it. It just means that she did it and no one else did. Yeah. So they're related meanings, but separate.
	So we may want to distinguish two different types of intensive modification. You're absolutely right, nice point. Other nice points people wish to make? Yes?

AUDIENCE:	So to clarify, the reason this tree is not valid [INAUDIBLE] is that "herself" is looking for something to bind to.
NORVIN RICHARDS:	Yeah.
AUDIENCE:	And so it needs to be binded [INAUDIBLE] binds to NP. It binds "Susan," and it binds "Susan's father." And it can't bind to "Susan" because of the c-command constraint. It can't bind to "Susan's father" because "father"--
NORVIN RICHARDS:	Because wrong gender.
AUDIENCE:	Right.
NORVIN RICHARDS:	Yup.
AUDIENCE:	[INAUDIBLE] himself.
NORVIN RICHARDS:	Yup. Yeah, that's it exactly. Yeah, so the idea is-- so we weren't asking why can't it refer to Susan's father. You just asked that question, and I think you answered it perfectly.

"Herself" can't refer to "Susan's father," which does c-command "herself," because Susan's father is male. Wake up. And it can't refer to "Susan" because "Susan" doesn't c-command it. Is it back? Good. Yes. Yeah. |
| **AUDIENCE:** | So then to clarify, if the sentence was, "Susan's father must like himself," that's fine because "Susan's father" is the NP that's c-commanding. |
| **NORVIN RICHARDS:** | Right. And that's my intuition about the sentence. Is that yours? And that would be OK. It means Susan's father has a healthy self-regard. Yeah? OK, cool.

So binding theory, I introduced you to binding theory as a test for structure, right? So once we are willing to trust binding theory at least a little ways, we can convince ourselves that we have a new way of finding out things about structure. We know we have the right structure if we have the right c-command relations to get the binding relations that we seem to find.

So for example, when we're thinking about sentences like this, "Susan told Stacy about herself," we're going to need it to have a structure in which "Susan" and "Stacy" both c-command herself. And so when we were talking before about complicated verb phrases, binding theory is the kind of thing that people use as a probe into the structure of complicated verb phrases. OK.

All right, so one part of binding theory is going to say anaphors, these are words like "herself" or "myself"-- in English, they all end with "-self." They need to be c-commanded by something that corefers with them.

And then we have a short name. I hope I do this on the next slide. I'm not sure if I do or not. We have a short name for to c-command something that you corefer with, we call that bind.

So we say that, in "Susan told Stacy about herself," "herself" needs to be bound. And there are two noun phrases that could bind it, "Susan" and "Stacy." And so we need a structure for this in which those both c-command herself, and either of them could corefer with herself. Yeah? |

AUDIENCE: Do all anaphors necessarily end in "-self," or are there cases where pronouns act as anaphors? So for example, "John said he went to the store," where "he" is referring to John.

NORVIN RICHARDS: Yeah, that's a very nice point. So, so far, you may have noticed all of my examples have only been one clause long. And we're going to make things more complicated in just a second. But here, just to get started on making things more complicated, we've been talking about the fact that you can say, "Susan must like herself."

If we make this an embedded clause, so if we say "Mary thinks Susan must like herself," well, "herself" can refer to Susan. But it can't refer to Mary. So "Mary thinks Susan must like herself." And that's not going to be because "Mary" doesn't c-command "herself." It does in the kinds of trees that we're drawing.

So you are finding a complication, which I was planning to hide for a few more slides. There's an additional requirement on anaphors. They don't just need to be c-commanded by something that corefers to them. They don't just need to be bound. They need to be bound by something that's sufficiently close.

And if they're in different clauses, they're not sufficiently close. And we'll talk about that soon. You'll get to look back with nostalgia on this little interchange in just a few minutes. Raquel?

AUDIENCE: This isn't really a question, but I think it's interesting that coreference could create a presupposition. "The magician made herself disappear." It's like, OK, well, suddenly the fact that the magician is female is a presupposition that's there. But it could be wrong, and you couldn't star it necessarily because you're not sure.

NORVIN RICHARDS: Yeah. No, I take your point. So I take your point to be, if you say "The magician made herself disappear," or "The magician made her father disappear," whether you use an anaphor or a pronoun, "magician" doesn't have any information about gender in it. But a fact about-- a thing about pronouns and reflexives in English is that they carry presuppositions about the gender of their reference. That's absolutely right. Yeah. Yeah, that's quite true. Yup. OK.

All right, so-- oh, good. I did say it on the next slide, bind. This is just a name for c-command and "corefer with" just because we get tired of saying c-command and "corefer with." We say alpha binds beta if alpha c-commands and corefers with beta.

So in "Susan must like herself," "Susan" binds "herself." "Susan" corefers with "herself," and it c-commands "herself." And anaphors need to be bound. And thanks to Faith, you know that, pretty soon, it's going to be more complicated than that. They need to be bound by something that's sufficiently close to them. Yeah.

AUDIENCE: Speaking about behavior of c-command, you mentioned earlier in the semester how normal pronouns or-- yeah, normal pronouns are not A c-commanded.

NORVIN RICHARDS: Yeah, so we're going to do pronouns next. Yeah.

AUDIENCE: OK.

NORVIN RICHARDS: Yeah, that's right. We're going to get to that. Actually, I think we're doing it next. Anaphors must be bound. OK, sorry, one more thing.

There are two kinds of anaphors. There are reflexives, which are the ones we've been concentrating on, words like herself and himself. And then there are what are called reciprocals, which have the same behavior. They're words like "each other."

So "John and Bill like each other." The meaning of "each other" is much more complicated than the meaning of "themselves," but "each other" and "themselves" have the same behavior in that they are OK in sentences like "John and Bill like each other" or "themselves," and that they are both bad in "John and Bill's father likes each other" or "themselves." So "each other" and "themselves" are both anaphors, and they're both subject to this requirement that they be bound.

So "John and Bill like each other" means something like "John likes Bill and Bill likes John," yeah? There's literature on exactly what reciprocals mean because it's complicated. For example, it's possible to say things like, "We piled the books on top of each other."

So each other doesn't mean for every pair in the group A relation B and B relation A, right? You might have thought, looking at this, that "John and Bill like each other," to interpret that, what you do is you take all of the pairs you can make out of the group. OK, there's one pair, you know? And what this means is John likes Bill and Bill likes John.

But if you say "The books are piled on top of each other," it doesn't mean this book is on top of that book and-- That's not what it means. So there's work on trying to figure out what the heck it means, what reciprocals mean exactly, which we will not get any further into now.

OK, this was Joseph's question, pronouns. Anaphors must be bound. Pronouns must be free. It sounds like a political slogan, but it's a fact about grammar, yeah? So pronouns need to not be bound.

So "Susan likes herself" is fine. "Susan's father likes herself" is bad. That's the behavior of anaphors, which we're familiar with by now. And "her" behaves the same way only backwards. So "Susan likes her," fine sentence as long as "Susan" and "her" are different people. So "her" can't be bound by "Susan." It can't be c-commanded by "Susan" if "Susan" and "her" are going to refer to the same person.

On the other hand, "Susan's father likes her"-- fine. So it's not quite true, but it's almost true that anaphors and pronouns are in complementary distribution with each other. So for a given meaning, you either use the pronoun, or you use the anaphor, OK? OK.

More examples-- even more examples. So now, we're getting to Faith's point-- my version of Faith's point, sorry. So "Susan likes herself." We've seen this is OK. "Susan thinks I like herself." Or I have the sentence on the board, "Mary thinks Susan must like herself." "Herself" is trying to get bound, in this case, on the slide by Susan. And it can't be.

The kinds of trees we were drawing for this kind of sentence, Susan certainly does c-command herself. I don't think I put the tree on the slide. So let me just create it quickly.

"Susan thinks"-- there's going to be a CP here, then null C. And then down here, we have a noun phrase, "I," and a verb phrase like "herself." So if we ask ourselves does-- here's the tree. Did I write the right sentence? "Susan thinks I like herself," yes.

If we ask ourself, does "Susan" c-command "herself," the answer is yes. If we ask what are the nodes that dominate the noun phrase "Susan," well, there's only one. It's this TP. And so if we're asking, does "Susan" c-command "herself," well, we're really asking, does this TP dominate "herself"? And yes, it does.

So "Susan" c-commands "herself." So it looks as though "Susan" ought to bind "herself." What we're learning here is the complication that Faith made me reveal early, which is that not only do anaphors need to get bound. They need to get bound by something which is close enough.

There's a principle. It's called principle A. You can think of A as standing for Anaphor. It says anaphors must be bound within TP. If this were Intro to Syntax, we would now spend weeks, possibly months trying to figure out what the real locality requirement is because it's more complicated than that. But that's close.

So the idea here is that "herself," yes, it's bound by "Susan" in this tree. But it's not bound by "Susan" within the smallest TP. Here's the smallest TP that includes "herself," and "Susan" is too far away. So there's a locality requirement. Does that make sense? So principle A says, anaphors need to be bound within the smallest TP that contains them.

And then principle B, where B stands for the principle that comes after principle A, says, pronouns must be free within TP, so just as we saw before, that pronouns and anaphors are, so far, in complementary distribution for a given reading. So you can say "Susan likes herself," and that means that you can't say "Susan likes her" and mean the same thing, that you mean that "Susan likes herself."

Similarly, we've now seen, thanks to principle A, that you cannot say "Susan thinks I like herself," where "herself" refers back to "Susan." And principle B says, yeah, pronouns have to be free within TP. So "Susan thinks I like her," where "her" refers to "Susan."

Fine, it doesn't have to refer to "Susan," right? It can refer to anybody. It can be free regardless of whether it's bound by "Susan" or not, free within TP. Yeah, Faith.

AUDIENCE: I may have just forgotten, but with that T there, is the invisible T that's dominated by T bar always necessary? Or could you just say--

NORVIN RICHARDS: This?

AUDIENCE: Yeah. And--

NORVIN RICHARDS: And also this? Yeah. You know what? In most of the trees I've been showing you, I've been smart enough to put auxiliaries in the sentences. So I've been saying things like, "Susan will think that I must like herself." And then people don't ask the question that you're asking.

But when I drew this tree, I was not smart enough to do that. There does need to be a T because-- why does there need to be T? Well, we have principles like the extended projection principle, which says that TP must have a specifier. And sentences without auxiliaries in them show the effects of that. So it doesn't matter whether there's an auxiliary or not.

Yeah. It doesn't matter whether there's an auxiliary or not. You still get the effects of the extended projection principle. So we do want there to be a T because we want there to be a TP. And we don't have any way to make a TP without starting with a T. So you have to merge T with a verb phrase and so on.

AUDIENCE: [INAUDIBLE]

NORVIN RICHARDS: Yeah. So I mean, here's-- I'm not totally unhappy about the direction this conversation is taking because you're forcing me to talk about syntax, which is fine, even though this is the semantic part of the story. Suppose I was smart enough to use an auxiliary here. So we'll do "Susan will think." And we'll forget about the embedded clause for a second.

We've talked about this, I think, that, if you want to ask a yes/no question, the way to do it is to head move T into C. So you ask questions like, "Will Susan think that" blah-di-blah? So bear that in mind.

And now, let's switch to the version of this where there isn't an auxiliary. "Susan thinks that I like." If I want to make a question out of that, what I do is I put "Does" here. And I get rid of the S here. So it's "Does Susan think that" blah-di-blah?

So there's a story about what's going on here, which says what's in T-- so there are various things that can be in T. There's "will" and "should," "might." And there's also "-s," as in "Mary thinks that I like her." And if you do T to C of "will" or "should" or "might," then you just move them over there. And nothing else happens.

If you have a "-s" then there are a couple of things that happen. If you aren't head-moving it, then it attaches to this verb. So you end up with "Susan thinks." And we have to figure out how these two things come together to form a verb. And sadly, it's long enough since we did syntax that I'm unwilling to try to tell you that. There's a big literature on trying to figure that out.

And then the other story is, if you're going to do T to C, if you're going to make a question, you're going to take this. It's not going to show up here. It's going to show up up here. So you would have expected this to be "-s Susan think I like herself?" But "-s" is too small to be an English word or something like that. And so you put in this "do."

There's a process that is called "do support." You add "do" there so that we'll have a verb to be part of. It's the story that people tell. And so that's why the question version of that is "Does Susan think that I like her?"

Can you see why I have been hiding all of this from you all semester? So I've been using auxiliaries instead of giving you verbs that have suffixes on them. This is why, because I didn't want to do this. But it's been fun anyway. But now, it's over, except it's not. Joseph?

AUDIENCE: Just a brief question--

NORVIN RICHARDS: Yes.

AUDIENCE: --about that movement, you said the extended production principle requires you TP has a specifier. So that means that, because [INAUDIBLE] creating a yes or no question means moving ahead out of TP, you can't move "Susan." Because then TP was the specifier, right?

NORVIN RICHARDS:	Yeah. Oh, I see.
AUDIENCE:	Yeah, why [INAUDIBLE]?
NORVIN RICHARDS:	No, no. Oh, you mean why are you moving the head? Why are you not moving a phrase?
AUDIENCE:	Why can't you just move the phrase around?
NORVIN RICHARDS:	There isn't a deep answer to that question. Forming questions involves taking whatever is in T and moving it into C. You'd like to know why we don't move other things, and that's a good question. This is--
AUDIENCE:	[INAUDIBLE] to her. And I said, you can't do this because of the shortest path.
NORVIN RICHARDS:	Ah, yes. I see. Yes. So, yeah, you can't take the verb and move it up there. That's right because that's too long. Why can't you move this? Because it's not a head. It's a phrase.
	Apparently, we think that only heads can move to attach to other heads. Yeah. And we might want to know why. There are lots of things we might want to know.
AUDIENCE:	[INAUDIBLE]
NORVIN RICHARDS:	Go take syntax. Yeah. Yeah? OK. All right, all of you, you dragged me kicking and screaming into doing more syntax. Shame on you. OK. Right, principle A, principle B, yes? Are people reasonably happy with principle A and principle B? So they say anaphors need to be bound within TP. Pronouns have to be free within TP.
	Side note, since I just told you universal about anaphors, anaphors only ever care about c-command. They never seem to care about linear order. They don't care about what precedes them or follows them.
	I should say that there are points of variation between languages. There are languages that have anaphors that need to be bound, but they can be bound longer than this. So there are languages that have anaphors that can be bound outside of the TP that they're in called long-distance anaphors. English doesn't have them, but Mandarin does, for example. So Mandarin, [NON-ENGLISH] is a long-distance anaphor.
	Principle A is not a parameter that distinguishes languages. It's a parameter that distinguishes anaphors. So Mandarin actually has two anaphors. It has an anaphor that behaves like this. It's just pronounced [NON-ENGLISH]. And then it has another one that is long distance that can be bound from outside its TP. It's just [NON-ENGLISH] by itself. Those of you who speak Mandarin can be thinking about that.
	There are languages that have more anaphors than that. Korean, I think, holds the record. It has four different anaphors with slightly different behaviors. Yeah.
AUDIENCE:	Do languages that have long-distance anaphors also always have this type of anaphor, or does it vary?
NORVIN RICHARDS:	As far as I know, every language has this type of anaphor. And long-distance anaphors are an additional luxury that a language can allow itself or not. I don't think there are any languages that only have long-distance anaphors. Yeah, good question. Yup? OK.

Where are we? OK, yes. So we have principle A. We have principle B. Anaphors need to be bound within TP. Pronouns have to be free within TP. And let's stick to English again.

Now, let's consider these sentences, "She likes Susan" and "Her father likes Susan," with these subscripts and these grammaticality judgments, which I hope everybody agrees with. So "She likes Susan"-- fine sentence, but she and Susan can't be the same person. Does either of our principles handle these facts? That's a leading question if there ever was one.

No, they do not. So first of all, principle A is obviously going to be useless here. There are no anaphors in these sentences. So forget principle A. Principle B, pronouns need to be free within TP. Well, is she free within TP in "She likes Susan"? Is there a noun phrase that c-commands "she" and corefers with it? Is "she" free?

Yes. She is free. Shall I draw a tree? What's the sentence? "She likes Susan." Someday, I'm going to ask somebody to make me a stamp, a chalk stamp, you know, that just has this tree, TP, T bar, [INAUDIBLE]. Wham. And then there it would be. That would be great.

"She likes Susan," yeah? Here's the pronoun. Pronoun needs to be free within TP. That is there had better not be anything c-commanding "she" that corefers with "she." Does anything c-command "she"?

I guess maybe T bar. So T bar is dominated by all the same nodes as noun phrase. But T bar doesn't refer to "she." It doesn't refer to "Susan." So "she" is free, yeah. So our principles don't handle these facts.

There are at least two things we could do. One would be to say, ah, principle B, we were wrong to confine principle B to pronouns. So it's really just a distinction between anaphors and everything else. So the problem with "She likes Susan" isn't "she." It's "Susan." So "Susan" also needs to be free within TP.

And then the story would be "Her father likes Susan." "Her" is embedded inside "her father." And so it doesn't c-command "Susan," and so there. That version of principle B would cover this.

But pronouns really are the opposite of anaphors. They need to be free within TP. So "Susan thinks I like her," where "Susan" c-commands "her" and corefers with "her," so "Susan" binds "her," is fine. Because although "her" is bound, it's bound by something that's far away. And that's all right.

But in "She thinks I like Susan," we're seeing that names do not behave like pronouns. "Susan" requires absolute freedom, freedom everywhere. Pronouns just need to be free within a certain domain, within TP let's say. But a name like "Susan" needs to be free everywhere. The fact that "Susan" is bound by "she" in that second example, "She thinks I like Susan," means that the sentence is bad. It doesn't matter that they're far apart.

So we make up a new principle-- it's called principle C-- and, also, a new term, R-expressions. R-expressions means things that are not anaphors or pronouns. It stands for Referring expressions, which is an unfortunate name because they don't necessarily refer. "Susan" does. It refers to Susan. But anyway, that's all it means. Things that are not anaphors or pronouns.

So everything that isn't subject to principle A or principle B is subject to principle C. Every noun phrase that isn't subject to principle A or principal B is subject to principle C, which says our expressions must be free everywhere. Our expressions must be free, and everywhere they're in chains. Yeah, OK?

All right. And then this is the fact that I made a big deal about before. Even though which thing precedes which other thing is the kind of thing that every infant knows as soon as they can hear, words and segment words, which infants are eerily good at, even though-- if you were going to design a computer, a language for computers to use-- I am not a computer person. You may have picked up on this. Even I think it would be easier for me to get a computer to figure out which thing linearly precedes which other thing than it would be to get a computer to figure out which thing c-commands which other things.

That's a much more complicated task, it seems to me, not that I know anything about this stuff. And yet all of us go for the more complicated task. We're built that way. We can't help it. So language doesn't care which thing precedes which other thing. It cares which things c-commands which other thing, always, in every language, over and over again. Yeah.

AUDIENCE: How do we draw a tree when the subordinate phrase is [INAUDIBLE]?

NORVIN RICHARDS: Oh. Well, we could do different ways. Where will I put this? I'll put it up here. So maybe you would start by drawing the TP first. So "Susan read a book," right? Do that for "Susan read a book."

And then we need somewhere to hang "while she was eating." And we need it to be some kind of adjunct. So it's not in the same kind of relation as anything else. What am I trying to say? It's not selected by anything. There's no particular reason for it to be anywhere.

So there are various ways we could do that. Notice, for example, that if this were an embedded clause, so if it were "I think that"-- so here's a C. It's going to be a CP-- sorry, a CP. So if we were doing, "I think that Susan read a book," the embedded clause "that Susan read a book" would look like this, right? It would have a CP here where I can just connect these. We have a CP with a C that that's got this TP as its sister.

And if we were going to add this embedded clause, this adjuncty clause to the beginning of the embedded clause, while she was eating, let's think about places to put it. If it's going to be before "Susan," we could ask, does it go here? Or does it go here?

So "I think that, while she was eating, Susan read a book" is, I think, something that we can say. "I think, while she was eating, that Susan read a book." I think does not mean the same thing. There's something wrong with that.

So this is at least one place that it can go between the C and the TP. And given that it can go between the C and the TP, maybe the easiest thing to do would be to just make it an adjunct on TP. We'll duplicate the TP node. And we'll have a CP here where I won't do the insides of it, but that's where you would put "while she was eating." Does that make sense? Yeah? OK.

So that's binding theory. I think I flagged the fact there are many, many things to say about binding theory. That's part of it. Reasons to be happy about binding theory, I first showed you binding theory as a probe into c-command relations, but there's so much more. There are lots of things we can do with binding theory. Let me show you one.

Here's a sentence. "Mary decided to leave." Yeah, fine sentence. How many TPs are in this sentence? well there's at least one. What's "to leave"? "To" isn't a preposition here. This isn't like "Mary went to Toledo," yeah?

In fact, this "to" is in complementary distribution with a bunch of different things. You can't say, for example-- you can say "Mary decided to leave." You can't say "Mary decided will leave" or "should leave" or, for that matter, "Mary decided left." These are not sentences.

So these are all bad, which makes people think that maybe "to" is the same kind of thing as "will" and "should." So here's a spot where you can only have one of these things. You can have "will," or you can have "should," or you can "have to." And so people think-- yeah.

AUDIENCE: Is "to" not joined with the verb itself, though, as part of the infinitive?

NORVIN RICHARDS: I don't know. This gets into questions about whether you believed your English teacher when she or he told you that you cannot say things like "Mary decided to immediately leave, but we decided to boldly go where no one has gone before." There are languages in which the marker of the infinitive is a morpheme that's attached to the verb. Yeah, you're absolutely right.

But in English, it's not so clear that it is. There's stuff like adverbs that you can put between the "to" and the verb, at least I can. Yeah? All right, Joseph?

AUDIENCE: Is the "to" shorthand for "that she should," "would," or--

NORVIN RICHARDS: Well, so this sentence means more or less the same thing as "Mary decided that she would leave." So interesting fact, you can't have "that" if you're going to have a "to." Yeah. If you have a "that," then you cannot have a "to." If you have "that," then you can have all these other things that would be here if "to" were not here. You could have a "will," or a "should," or a past tense, or all of these other things.

That's the relation that we talked about in terms of selection. We said C selects T. T is selected by C. So these are all reasons to think maybe that "to" is a T.

There are two TPs in this sentence. There's "Mary decided to leave." That's one TP. And that "to leave" is another TP, OK? Are you buying this? You should. Yeah.

OK, so maybe there are two TPs. But if there are two TPs in this sentence, we have this principle, the extended projection principle, that says every TP must have a specifier. But we only seem to have one subject, "Mary," who's doing the deciding.

Now, there's a classic answer to this question, which says English is a language with many pronouns, and one of them is invisible. And the invisible one is the one that is the subject of "leave." It's the thing that's satisfying the EPP here. So it isn't that TP doesn't have a specifier in "to leave." That TP does have a specifier. It's just an invisible specifier.

When this theory was first offered, people reacted the way you might expect them to, sort of the way some of you possibly mentally are: "I mean, come on, you're just trying to avoid having to say that the EPP is not right or parameterize the EPP to different kinds of positions." But actually, binding theory gives us some reasons to believe that there is such a thing as PRO. And let me show you some of the arguments. So in this case, that's a story that says, no, the EPP is being satisfied in the embedded clause by an invisible pronoun that refers, in this case, to Mary.

Here are some data. "John promised Mary to defend himself." "John promised Mary to defend herself." "John told Mary to defend himself." "John told Mary to defend herself"-- sentences with grammaticality judgments.

I'm going to copy these sentences onto the board because I want to do various graphic things with them. And while I'm copying them, I'll ask you to look at those sentences and ask yourself whether you get these judgments. So "John promised Mary to defend herself"-- "himself." Did I put those in the wrong order? Yes, I did.

And then "John told Mary to defend himself"-- "herself," where the middle two-- so this is bad and this is bad. Do people get these judgments? Is this true? Am I just making this up? Nobody wants to protest? OK.

So I told you before we're going to use binding theory to find things out about how far away things are, which things c-command which other things, now that we have this theory that we think, we hope, is more or less reliable. We know, when we look at an anaphor, it had better have an antecedent that's close enough to it. And we think that close enough is more or less within the same TP.

Forget it, now, that I've done all that talking about anaphors. Forget about the anaphors for a second. If I say "John promised Mary to leave," who's going to leave?

AUDIENCE: John.

NORVIN RICHARDS: John. And if I say "John told Mary to leave," who's going to leave?

AUDIENCE: Mary.

NORVIN RICHARDS: Mary, yeah? So the understood subjects of these embedded clauses, the PRO if there's a PRO, is going to refer to John when the first verb is promised. But it's going to refer to Mary when-- I'm just going to give it a subscript, Mary-- the first verb is told, yeah? So let me do this the easy way first.

If there is such a thing as PRO, we ask ourself, these anaphors, they need to get bound within the smallest TP that contains the anaphor. And the smallest TP that contains the anaphor is going to be this, yeah? And so when we ask ourself "Is the anaphor bound by a noun phrase that's close enough to it?" well, the answer is yes here. Because "himself" gets to be bound by that PRO, "John." That refers to John. And so "himself" can be John.

It can't be "herself" because the PRO is "John." It's not "Mary," whereas, when the higher verb is "told," then the PRO is "Mary." And so now "himself" is bad because "himself" can't refer to Mary. And "herself" is good. It can get bound by "Mary."

So we can capture all of these facts if we're willing to posit the PRO, which refers to who it should refer to, the person who's going to do the defending. That'll depend on what the higher verb is. Interesting fact, which people work on-- what determines who PRO refers to? Why is it "John" for "promise," but "Mary" for "defend"? It's what's called subject control and object control. But once we believe in PRO, we have a handle on why the anaphors refer to who they refer to.

OK? Now, let's do this the hard way. What if we didn't believe in PRO? Well, if we don't believe in PRO, woo, what we want is for this position to be bindable by "John," but not by "Mary." And we want this position to be bindable by "Mary," but not by "John."

And this is going to be hard, right? The first one is going to be especially hard. So far, our conditions just say, anaphors have to get c-commanded by something that's close enough to them and corefers with them. But if "John" is close enough to that anaphor position, well, then surely "Mary" is. "Mary" is closer. There's no way to do that. I'll have to come up with something very complicated.

And the second set of examples is also going to be kind of hard because "Mary" is the object of "told." So this anaphor will need to have a binding domain that gets up to the higher verb phrase, a domain in which its anaphor finds a binder. It's going to need to find a binder in a domain.

We have to say, OK, we were wrong about TPs. It's, like, the next verb phrase or something. The domain in which it finds a binder has to be this new special kind of domain that doesn't seem to be useful anywhere else. It's a mess, basically. And PRO gets us out of the mess if we're willing to put PRO in the places where we want to put it.

So one reason to be happy about binding theory is that it gives us a reason to make a move that we might have wanted to make anyway. These infinitives are acting like they have subjects in two respects. They are satisfying EPP, first of all. And they are acting like they have a subject that corefers with somebody in the higher clause, either "John" or "Mary," for purposes of binding theory. Binding theory is simplest if there is a pronoun there.

Now, minor problem, we can't see a pronoun there. But if we're willing to rely on binding theory a little bit, we can use binding theory to convince ourselves that the pronoun actually is there. It's just that we can't see it. We have a new detector for pronouns. We can find them this way.

Does that make sense? Are all of you appropriately skeptical? Is anybody inappropriately skeptical? Do you have questions about any of this chain of reasoning? It's a reason to take seriously the idea that there are invisible pronouns sometimes.

We talked about invisible pronouns before, I think. I think I gave you examples like I can say "Defend yourself," yeah? I think somebody said that they were taught in school-- I can't remember who it was-- that the subject of an imperative is understood as "you," that this means "You defend yourself."

And one reason to take that seriously is that, yeah, an anaphor here is acting like there is a subject around, or at least another noun phrase around, that refers to "you." Because "Defend yourself" is fine. But "Defend myself"-- no good, right?

No matter how much you might want to say it, that's not the way to say it. You say "Defend me," no? It's acting like the subject is "you." OK, you can't hear it. You can't hear the "you," but there's a "you" there. You can use these anaphors to find it.

Same thing here-- in "John promised Mary to defend himself," there's a pronoun in the subject of "defend." It's really "John promised Mary him to defend himself." And that "him," that PRO, is referring back to "John." In "John told Mary her to defend herself," that "her" is referring back to "Mary." Binding theory tells us so.

Yeah, yeah, yeah-- slide after slide after slide. Yes. OK, here's another reason to be happy about binding theory, another thing that it teaches us, a new argument for something that I showed you an argument for before. And now, I will show you a new argument, possibly a simpler argument. Actually, I should start with this one. "Which picture of himself did John like best"? First-- setup for the argument.

Observation, "John" sure doesn't look like it c-commands himself. But "John" used to c-command "himself." And apparently, principle A can be satisfied with nostalgia. So it thinks back to the happy days when "John" used to c-command "himself," back before you did wh- movement. And it's satisfied. Principle A, it's easy going that way.

So this starts off with "John liked which picture of himself best?" "Which picture of himself" starts off as the object of "like." And it wh- moves. It becomes the specifier of CP. Shall I draw a tree for that, or is that clear?

I'm sorry. Those were yes/no questions with opposite answers. Who would like me to draw a tree for that? Yes? OK, let me draw a tree for that. I'll hide these trees. So-- stamp. John-- yeah.

Here's a noun phrase. I'm going to leave out "best" just because we don't need it. Here's your DP, "which," and N bar, "picture," prepositional phrase, "of," and the noun phrase, "himself." OK, so this is just "John liked which picture of himself." We could put a "best" in here. I don't know why I left out "best." We'll put it here.

There, so "John liked which picture of himself best?" And then wh- movement will take this noun phrase and move it to make it the specifier of a CP, which is up here. So now, we have "which picture of himself" in the specifier of CP. And "did" ends up here because we've moved T to C and done do- support, which is something that Faith made me talk about. Yeah?

So "Which picture of himself did John like best?" And "which picture of himself"-- which I'd spelled without the final H, just to give you an additional challenge-- "which picture of himself" starts off as the sister of "like." And wh- moves and becomes the specifier of CP. Yeah? That's the derivation for that.

So fact, which we're going to have to get used to-- after we do the movement, "John" no longer c-commands "himself," right? What does "John" c-command? Well, we ask which nodes dominate "John." And it's these nodes. So "John" c-commands its sister and everything its sister dominates. So "John" c-commands "like which picture of himself best." But "which picture of himself" has moved out of that domain. It's up here.

Apparently, the fact that "himself" used to be down here in a position that "John" could c-command is good enough. It's a phenomenon called reconstruction. It's as though, when you are evaluating things for binding theory, you get to rewind the tape a little bit and think, oh, yeah. This used to be over here. That's good enough. Various ways to talk about that, but that's one.

So file that fact. Yes, I just said that. Thank you. This phenomenon is called reconstruction. You treat something which is moved as though it hadn't.

OK. Now, let's think about longer, more complicated questions, like "Which picture did John think that Mary bought?" So "which picture" has wh- moved, right? But we talked about this question about whether it has moved once in one mighty leap, started off as the object of "by" and moved through all of that intervening material and became the specifier of the higher CP, or moved in a series of hops.

Notice that "John thinks that Mary bought a picture" has two CPs in it. There's "that Mary bought a picture." That's the embedded clause. And then there's the matrix clause. And we raised the question. And I gave you all of these Dinka facts that were meant to get you to take seriously the possibility that the second picture is the right one, that movement is what is called successive cyclic. That is you move in short hops. You don't move in mighty leaps.

So a wh- phrase, it's not just that it likes to move to the specifier of CP. It likes to land in every specifier of CP that it can find along the way. It moves in this series of short hops. And I gave you some Dinka facts that were meant to get you to take that possibility seriously. Here's another set of facts that might also get you to take that possibility seriously.

Think about a sentence like, "Which picture of himself did John think that Mary bought?" First of all, it's fine. Do people agree? So "himself" can refer to "John." All right, now, let's think about why it's fine.

"Which picture of himself" starts off as the sister of "by," starts off in the embedded clause. And it ends up, well, in the position where it's pronounced, in the matrix clause. Is "himself" bound by "John" in the position where it's pronounced? The specifier of the highest TP? Does "John" c-command that position?

No, right? Shall I draw a tree for this? Would that be a good thing to do? Let's draw a tree. "Which picture of himself did John think that Mary bought?"

Here's "John." "Think," there's the CP. "That," there's a TP. "Mary," here's T. And here's a VP and then "bought." And so we start off with "which picture," which I'm running out of room, so I'm going to use a triangle. Here's "which picture." I'm going to use a triangle, and I'm going to abbreviate picture as "pic."

And the question we're asking-- and so here's the tree we start off with, yeah? Anybody wish to object to any aspects of this tree? Is this is OK? All right. And the question we're asking ourselves is, this noun phrase, does it move just once to here? So we have which picture of himself.

[SNEEZE]

Bless you. Does it move just once, or does it stop along the way here? That's the question we're asking ourselves. And now, we're going to use binding theory to come up with the answer. Does "John" c-command "himself" here? No. I just said "no" before I drew the tree. But now, that I've drawn the tree, you can see that the answer is, in fact, no. So "John" doesn't c-command this position.

Does "John" c-command "himself" when himself is down here? Yeah, right? So what's the c-command domain for "John"? Well, it's its sister, that T bar, this T bar here, and everything this T bar dominates, so all of this. So "John" c-commands this position, "himself."

Is this just reconstruction? Can "John" bind this? No, it's too far away, right? And so we can see that here. You can't say "John thought that Mary bought a picture of himself." So this position is too far away. And this position "John" doesn't c-command. If these are the only positions, then we are doomed. "Himself" can't be bound happily in either of those positions, doomed.

But if "which picture of himself" spent some time here, well, then "John" c-commands "himself" when "which picture of himself" is here, right? This is inside this T bar, "John"'s sister, yeah? It's dominated by all the same nodes that dominate "John." And it's not contained in any TP that excludes "John." Remember, our conditions on how far away things can be and still bind say that anaphors need to have binders that are contained in all the TPs that contain them, that aren't excluded by any TPs.

So if we do successive cyclic movement, which Dinka already told us that we should, if movement happens not in one big jump, but in two small jumps, then we have an account of this, the fact that the sentence is OK. The sentence is OK because "himself," yes, it's been here. Yes, it's up there, but it's also been here. And the fact that it spent time here is why the sentence is OK. Binding theory gives us a new reason to believe that, cool, so some of the cool things binding theory is for. Yeah.

AUDIENCE: So it's like you go to multiple museums in one day, they give you a little stamp to get in the museum.

NORVIN RICHARDS: Yes.

AUDIENCE: And so at the end, you look a little bit different. You all have stamps to show that you've been to multiple museums.

NORVIN RICHARDS: Yes, it's just like that. Yes. Yes. So "himself" has been here, and it's been up there. But it's also been here. And the fact that it was here meant that it got to go see the T-Rex skeleton while it was here. Yeah? OK, cool. So movement is successive-cyclic-- new reason to believe that.

We have 15 minutes left, and I don't think I can do this next thing in 15 minutes. It involves guards. No, maybe I can. Let's start at least, and then this will give you something to think about until we get to Thursday.

So consider this sentence. "Two guards seem to me to be standing in front of every building." Is that ambiguous? Yeah, it's ambiguous in a familiar way, right? It either means each building is guarded by two guards as far as I can tell, or there are two really weird guards who are guarding all the buildings at once. Yeah, it has those readings at least. How about this sentence? "Two guards seem to themselves"--

[LAUGHTER]

Sorry. "Two guards seem to themselves to be standing in front of every building." This is not ambiguous. This means that there are two guards who need to be taken off duty. There are two guards who are having hallucinations of being very, very large. That's what this sentence means.

It doesn't mean-- and there's something else it could mean. It could mean this building has two guards who think that they're standing in front of it. That building has two different guards who think that they're standing in front of it. That building has two other guards who are standing in front of it.

In a sense, the reading that it actually has is the more reassuring one. It just means that there are two guards who really need a psych profile, whereas on the other reading there are however many buildings there are times two. There are that many guards who are in psychological trouble.

So it doesn't mean all of the things that it could mean. And you might be able to guess the problem is themselves. That's what's going to prevent the other reading. But for reasons of time, let's let it prevent the other reading on Thursday.

So come back on Thursday, and I'll finish this point, another thing that binding theory is for. We'll talk a little more about reconstruction, exactly what it is. Because it's fascinating. There's a lot of really cool work on trying to figure out what the heck it means. OK? Questions about anything else? All right, good. Go forth and think about linguistics.