**564 Lecture 26** Nov. 30

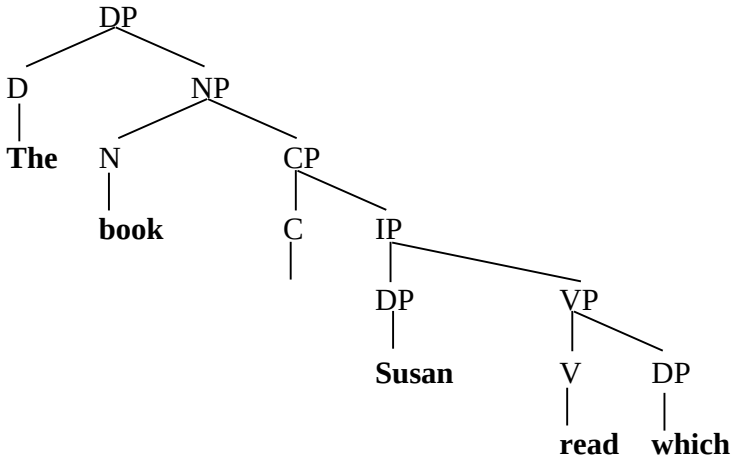
## 1 Relative Clauses

Ok, I was wrong about relative clauses. There **is** movement involved. The curious thing is that it's movement of a semantically vacuous element, that leaves behind a semantically interpretable one (here is where autonomy of the syntax really comes into the fore).

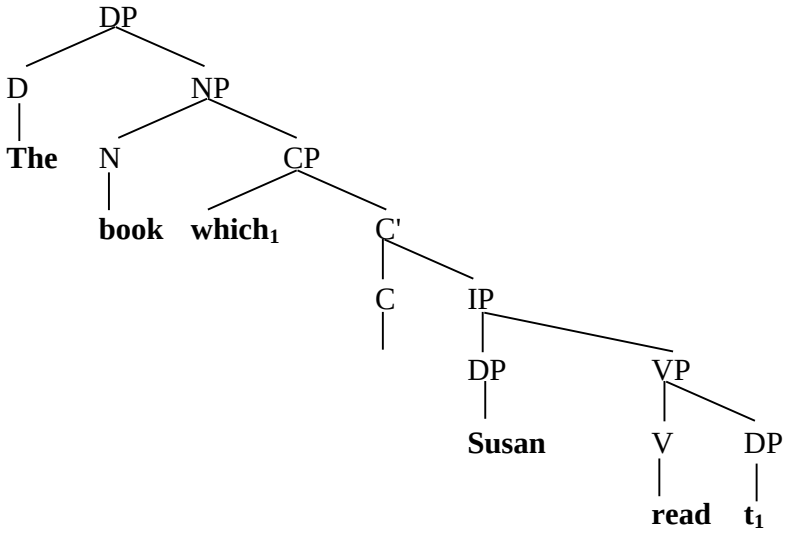
At least, that's the conclusion I draw from the discussion of PRO subjects on 227-228. Here's what happens:

1. The book which$_1$ Susan read.

(a) before movement




(b) after movement



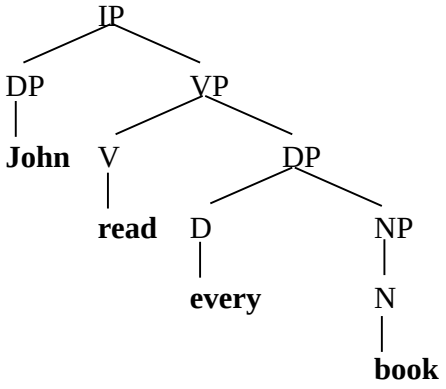

Now, (b) is an interpretable structure. (a) is not, because the "which" is semantically vacuous. In (b), the "which" is still semantically vacuous, but because it's moved, it's

acquired an index and left behind a trace, and the trace is beautifully interpretable, and the index tells us to abstract over it.

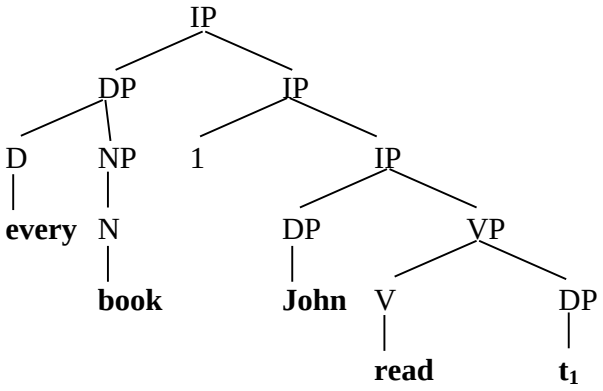
Basically, here, we have movement to create a simple predicate abstraction. (Note that sometimes the *which* is unpronounced, but we still need to assume movement anyway, because if we didn't, no operator-variable structure would be constructed and a sentence like "The book Susan read is interesting" would be uninterpretable.

In Quantifier Raising, on the other hand, we create a predicate abstraction *and* move an interpretable DP, which then combines with the predicate abstract. The movement creates the trace/index structure, but because the moved thing is interpretable this time, it combines with the predicate abstract to give a final interpretation to the sentence of type t.

2. (a) before QR

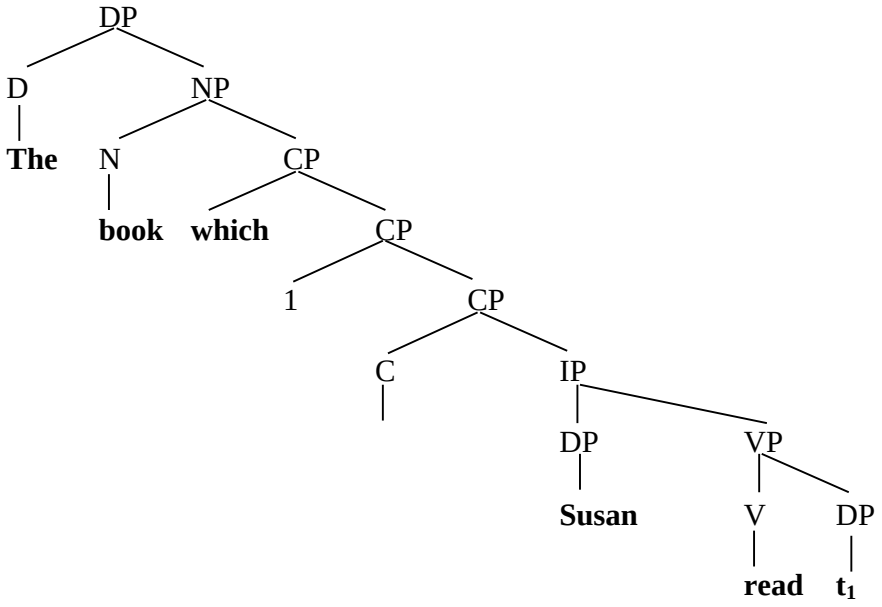



(b) after QR




Now, just to make our adjunction in the case of relative clauses parallel, we can assume that rather than attaching the trace to the moved, vacuous relative pronoun, we move the vacuous relative pronoun and adjoin it, and adjoin the index below it, as in 3:

3.



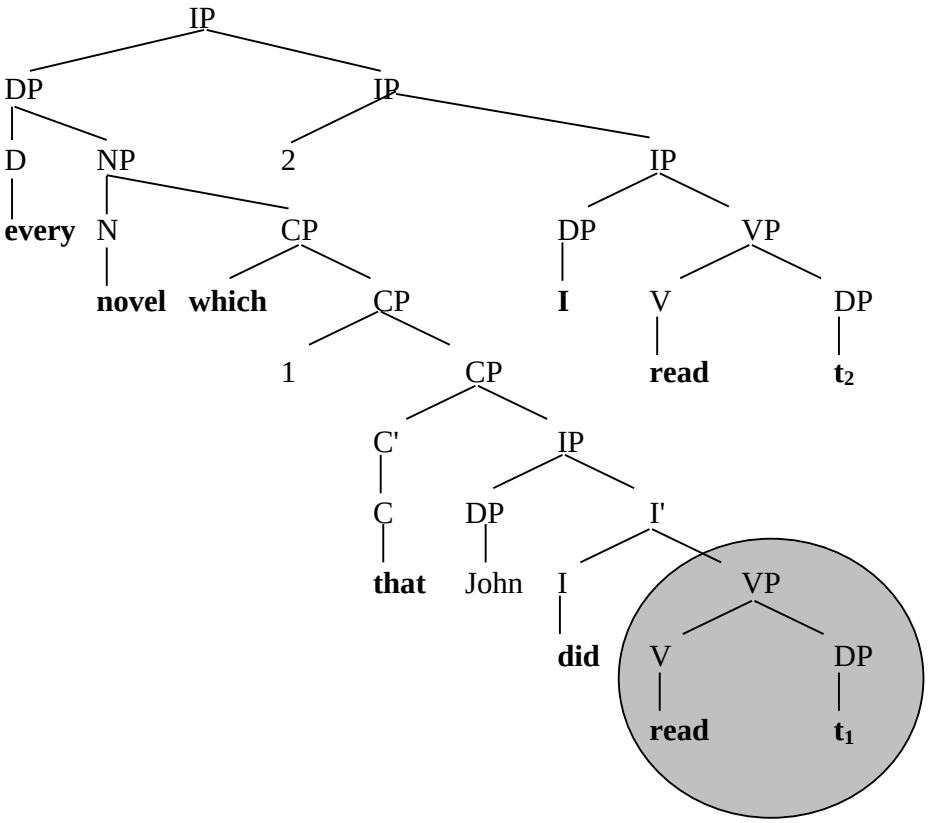

Now, we've got a structure that is perfectly interpretable for our relative clause, and resulted from movement of a vacuous item that produced exactly the same structure that movement of a contentful item would.

It's worth noting that it doesn't make any difference to the interpretation if a non-quantificational DP moves; the end result is still the same. H&K thus conclude that it's fair to assert that any and all DPs may move. Only quantifiers, however, must.

## 2 Antecedent Contained Deletion

Recall that last time we argued that sentences like (4a) demonstrated the need for QR, whose structure is shown in 4b:

4. (a) I read every novel that John did
(b) [every novel that John did]$_1$ I read $t_1$




Now, interpretation will work beyootifully, because traces are interpreted as bound variables (like pronouns, right?). The intuitive interpretation for the sentence now is, "Every novel such that John read it, I read it". The fact that the DP trace in the matrix clause is included in the deleted VP in the quantifier DP's relative clause means that everybody's got an appropriate variable to predicate abstract over.

Note that this approach to ACD is incompatible with a copy theory of traces, like that of Chomsky 1995. If the trace in the matrix VP were interpreted as a copy of the DP which we QR'd, we'd be right back where we started.

## 3 Another argument for QR: bound pronouns.

Now, when we're talking about pronouns and reflexives and their antecedent is a DP like **John** or **Mary**, we have so far basically assumed that their interpretation is essentially the referent of the proper name. So in 5a and b below, it seems reasonable to assert that the pronoun simply inherits the reference (denotation) of its antecedent:

5. (a) Mary$_1$ likes herself$_1$.
(b) John$_1$ didn't notice the snake next to him$_1$.

What about in cases like 6a and b?

6. (a) Every woman likes herself.
(b) No man noticed the snake next to him.

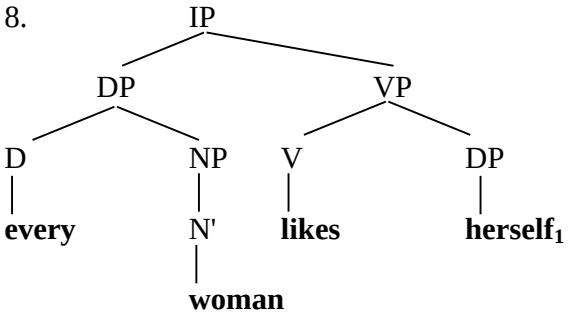
In particular, it's worth noticing that these pronouns *don't* inherit the denotation of their antecedent. If they did, they'd be interpreted like 7:

7. (a) Every woman likes every woman.
(b) No man noticed the snake next to no man.

But the meanings of the sentences in 6 and those in 7 are very different. 6a means that all women are self-likers, and 6b means that for no man is it the case that that man noticed the snake next to him. It seems pretty clear that we need bound variable interpretations for these pronouns in these cases.

So, let's look at the representation of (6a) and see what interpretation we get:

8.




The problem is going to be that, when we come to interpret the VP, it'll still be assignment-specific. Recall from the "Pronouns and Traces Rule" that the interpretation of the pronoun is whatever the assignment function assigns to the number of its index. So the denotation of the VP is going to be:

9. (a) *denotation of the VP:*
$[\lambda x \quad D_e . [\lambda y \quad D_e . y \text{ likes } x]]$ ($[[\textbf{herself}]]^a$) =
$[\lambda y \quad D_e . y \text{ likes } [[\textbf{herself}]]^a]$

and the denotation of the whole sentence will be:

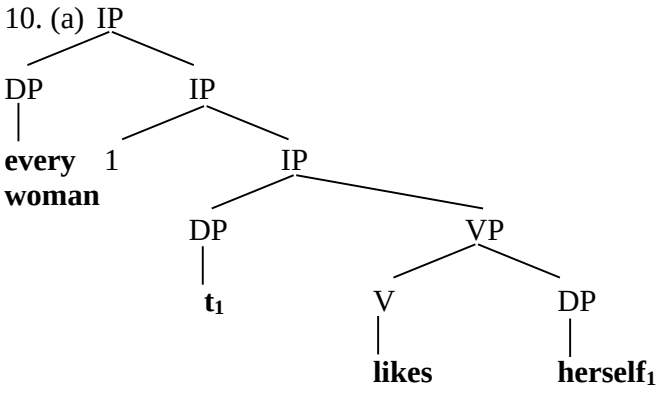
(b) 1 iff {x: x is a woman} {y: y likes $[[\textbf{herself}]]^a$ }

Let's say that the assignment function a = [1 → Sue] (because we've been talking about Sue earlier, say). Then the denotation of the whole sentence is:
(c) 1 iff {x: x is a woman} {y: y likes Sue }
or in plain English, "Every woman likes Sue".

So. That ain't right.

What happens, however, if we QR the subject DP and adjoin it to IP, giving the following structure?

10. (a)




Then we're going to get the following interpretation for the lowest IP:

(b) 1 iff $[[\mathbf{t_1}]]^a$ likes $[[\mathbf{herself_1}]]^a$.

And after predicate abstraction, we'll have the following interpretation for the second lowest IP:

(c) $[\lambda x \quad D_e \textbf{ . } [[\mathbf{t_1}]]^{x/1}$ likes $[[\mathbf{herself_1}]]^{x/1}]$

and by our pronouns and traces rule we'll have:

(c') $[\lambda x \quad D_e \textbf{ . } x$ likes $x]$

and finally, we can give that as an argument to the quantificational DP **every woman** and lo and behold, we've got:

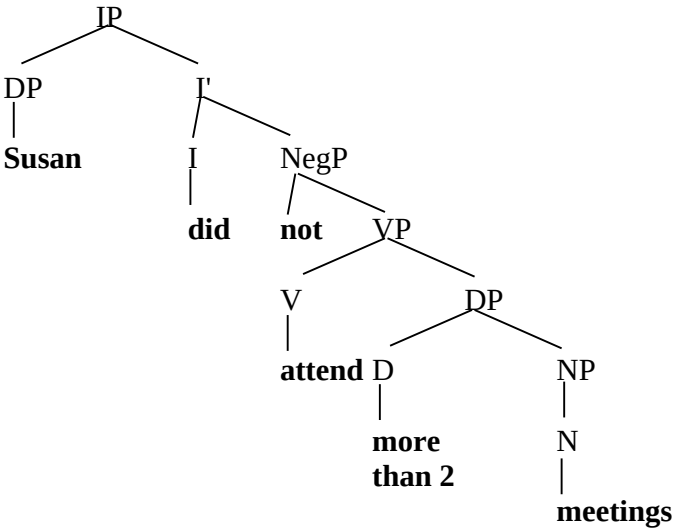
(d) [[IP]] = 1 iff {x: x is a woman} {y: y likes y}, that is,
iff every woman is such that she likes herself.

So, QR works well in these cases as well.

## 4 More tricks with QR: Quantifiers, negation, and VP-internal subjects

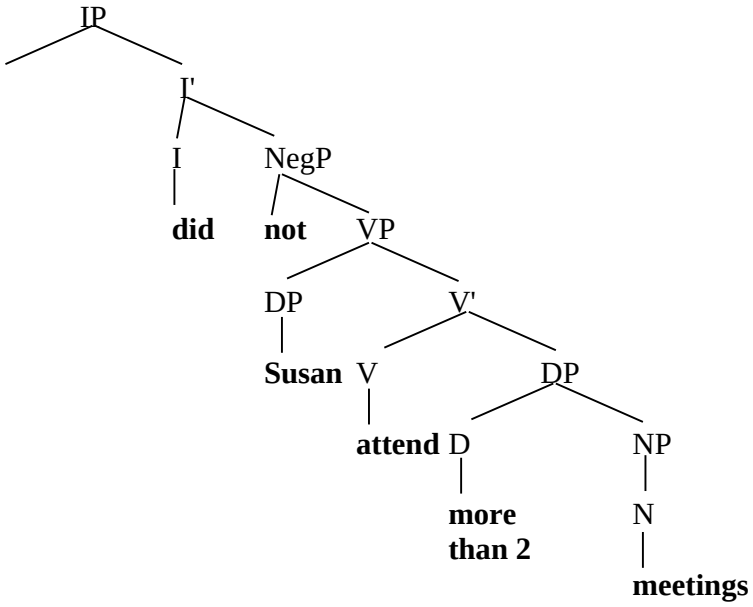
Now, where is negation in a sentence like (11)?

11. (a) Susan didn't attend more than two meetings.




Let's assume that **not** has a denotation exactly like "it is not the case that", i.e. that it takes an argument of type <t> and returns a value of type <t>. In the present situation that will produce an uninterpretable structure. We can make it be an interpretable structure, however, if we follow most current syntactic theorists in assuming that subjects are not base-generated in SpecIP, but rather in SpecVP. Then VP will be of type t, and **not** will combine with it perfectly happily. The structure will look like this:

12.

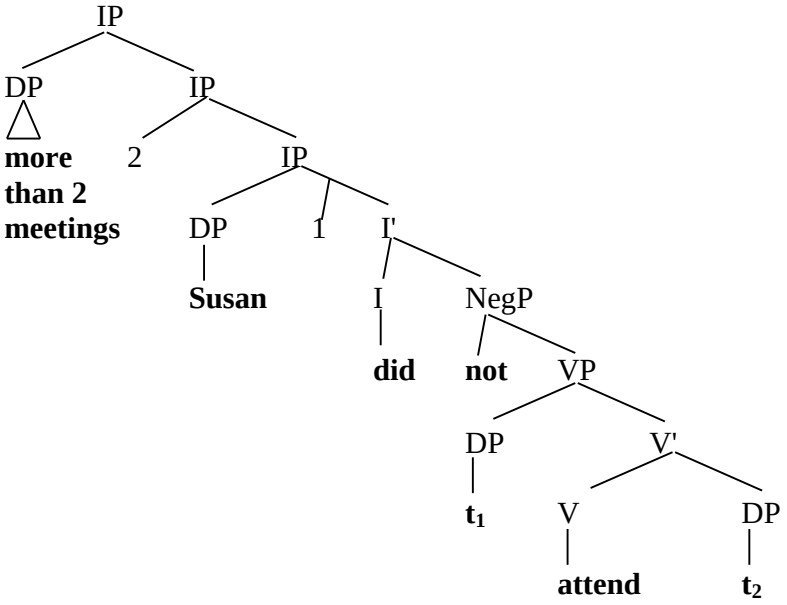


Then, in order to get the correct structure, **Susan** will move and adjoin to IP. Note that this won't make any difference in the interpretation of the overall sentence: **Susan** will merely be creating a predicate abstract over the I', which is of type t (for our present purposes, **do** is vacuous), and then she'll be interpreted in the same argument slot that she was before. (Note: this will create a problem for interpretation of quantificational subjects inside negation?)

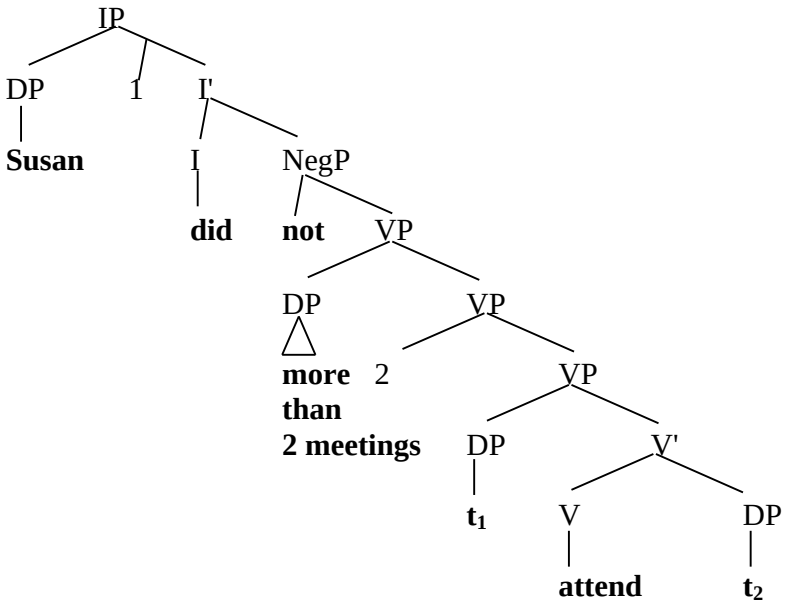
Why should we bother with this? Well, it means that, given our current assumptions, we can now adjoin moved quantifiers to VP as well as to IP. And considering that a sentence like (12) has two readings, one where the quantifier **more than two** takes scope inside the negation, this may very well be something we wish to allow.

(So, there will be two possible LFs for 12, one like13a and one like 13b. It should be clear that one will produce a reading where negation takes wide scope w/r to the quantifier, and the other will produce a reading where negation takes narrow scope.)

13. (a)



(b)




## 5 The End

I was hoping to be able to make some big statement about the overall state of the world or something at this point, but I don't really have anything suitable. Tricks with quantifier raising is the moral of the story.

For a better answer to Erika's question about how exactly to encode the difference between Sense and Reference in belief contexts, read H&K chapter 12, and/or deSwart chapter 9. I don't have time to talk about intensional systems, but here's some terminological notes:

14. (a) *opaque* contexts are those in which the way the real world is doesn't have any bearing on the truth-value of the proposition.

So

(b) "Susan believes there was no gin drunk at the party"

can be true or false independently of whether there was any gin drunk at the party. What the predicates in opaque contexts do is introduce possible worlds: the meaning of (b) is, in colloquial English, (c):

(c) In all worlds w' W that are compatible with Susan's set of beliefs in the actual world w, no gin was drunk in w'.

15. Modals introduce opaque contexts too:

(a) Susan must be home. = □(Susan is home)

(b) Susan may be home. = ◇ (Susan be home)

"Must" and "can" are like the universal and existential quantifiers, respectively. "Must" says that in all possible worlds compatible with the speaker's knowledge, the proposition

"Susan has gone" is true. Similarly, in (b), "Can" says that in at least one possible world compatible with the speaker's knowledge, the proposition "Susan be home" is true.

I'm mainly showing you these so that you'll recognize the square and the diamond when you come across them.

Read the rest of the textbooks if you get a chance, it'll do you good.