

CAS LX 522 Syntax I

Week 15a.
Relative clauses, QR/ACD

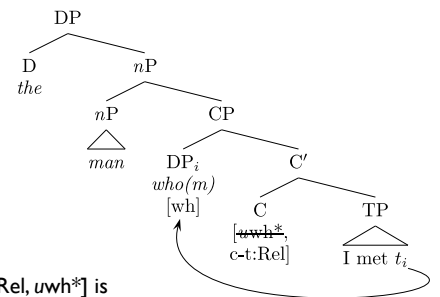
Relative clauses

- Another place where we see *wh*-movement, besides in explicit questions (either in the main clause or embedded) is in **relative clauses**.
 - The book which I read
 - The woman who(m) I met
- These consist of a **head noun** (*book, woman*) and then what appears to be a *wh*-question that further specifies the referent of the head noun.

Relative clauses

- Relative clauses serve to *modify* the head noun.
- Kind of like adjectives, or PP modifiers.
 - *The unhappy students.*
 - *The students from Vancouver.*
 - *The students who solved the problem.*
- So where would you put them?

Relative clauses



- The structure of a relative clause:
 - A CP [clause-type:Rel, ω wh*] is adjoined to the NP, like an adjective, or a PP modifier.
 - The meaning is essentially “the man with the property of being the answer to ‘Who did I meet?’ ”
 - We’ll see in a moment that C [Rel] can be pronounced as either \emptyset or as *that*.

Differences between questions and relative clauses

- The “question” inside a relative clause has a couple of odd properties, not shared with regular main clause or embedded questions.
 - *The problem what I solved.
 - The problem which I solved.
 - The problem which I will solve.
 - The problem I solved.
 - The problem that I solved.

Which/that/ \emptyset

- In addition to being able to say
 - The book which Mary read
- We can also say
 - The book that Mary read
 - and
 - The book Mary read
- And they all mean the same thing. So we expect that they would all have basically the same structure (they all have a question adjoined in the nP)—**so where is the *wh*-word in the last two?**

Op

- The secret to these last two kinds of relative clauses is **Op, the silent wh-word**.
- That is, *the book which Mary read* and *the book Mary read* are really exactly the same except that in one case you pronounce the *wh*-word, and in the other, you don't.
 - the book [_{CP} which_i Mary read t_i]
 - the book [_{CP} Op_i Mary read t_i]

Op

- It is also possible to pronounce *that* with *Op*, giving us:
- the book [_{CP} Op_i that [_{TP} Mary read t_i]]
- Why can't we pronounce *that* with *which*?
- *the book [_{CP} which_i that [_{TP} Mary read t_i]]

Doubly-Filled COMP filter

- The Doubly-Filled COMP filter is the traditional "explanation":
- **Doubly-Filled COMP filter:**
* [_{CP} wh-word if/that/for...]
- You can't pronounce both a *wh*-word and C at the same time. Thus:
 - the book [_{CP} Op_i [_{TP} Mary read t_i]]
 - the book [_{CP} Op_i that [_{TP} Mary read t_i]]
 - the book [_{CP} which_i [_{TP} Mary read t_i]]
 - *the book [_{CP} which_i that [_{TP} Mary read t_i]]

Op

- Skeptical of *Op*? Is there really *wh*-movement of *Op*, a silent *wh*-phrase?
- I read the book [_{CP} which_i [_{TP} Mary said [_{CP} that [_{TP} Bill bought t_i]]]].
- *I read the book [_{CP} which_i [_{IP} Mary wonders [_{CP} who [_{TP} bought t_i]]]].
- I read the book [_{CP} Op_i (that) [_{TP} Mary said [_{CP} that [_{TP} Bill bought t_i]]]].
- *I read the book [_{CP} Op_i (that) [_{TP} Mary wonders [_{CP} who [_{TP} bought t_i]]]].

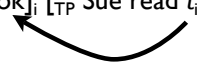
Op

- If we have a silent *wh*-word, why can't we ask questions with it?
 - Where_i did Mary buy this book t_i ?
 - The place [_{Op_i} Mary bought this book t_i]
 - When_i did Mary buy this book t_i ?
 - The time [_{Op_i} Mary bought this book t_i]
 - Why_i did Mary buy this book t_i ?
 - The reason [_{Op_i} Mary bought this book t_i]
 - How_i did Mary buy this book t_i ?
 - The way [_{Op_i} Mary bought this book t_i]
 - *_{Op_i} did Mary buy this book t_i ?
- See why?


Op

- Recoverability condition: The content of a null category must be recoverable.
 - the place [_{Op_i} (that) Mary bought that book t_i]
 - the day [_{Op_i} (that) Mary bought that book t_i]
 - the reason [_{Op_i} (that) Mary bought that book t_i]
 - the way [_{Op_i} (that) Mary bought that book t_i]
- In each case, we can tell what the *wh*-phrase is by looking at the head noun.


QR

- Sue read every book.
For every book x , Sue read x .
- [every book] _{i} [_{TP} Sue read t_i].

- We're finishing up with one more argument for Quantifier Raising. The idea being that, in order to be interpreted, quantifier phrases must move to a position outside the clause (adjoining to TP). This is almost never *audible* movement, but there is evidence that it happens anyway, abstractly ("covertly").

Weak Crossover

- 
- *Who _{i} does his _{i} roommate like t_i ?
- Who _{i} t_i likes his _{i} roommate?
- The first argument was based on weak crossover. Audible ("overt") movement of *wh*-phrases seems to be constrained by WCO. If this is simply a property of movement, then finding WCO effects with quantifiers constitutes an argument that quantifiers also move.
- **Weak Crossover (WCO):** A coindexed pronoun cannot intervene between an operator and its variable.

WCO

- [Every girl] _{i} [_{TP} t_i likes her _{i} roommate].
- For every girl x , x likes x 's roommate.
- 
- [Every girl] _{i} [_{TP} her _{i} roommate likes t_i].
- For every girl x , x 's roommate likes x .
- WCO is about moving over a bound variable—so if WCO rules out this meaning, there must have been movement. There must have been QR.


ACD

- Here's another reason to believe in QR, *antecedent contained deletion*. This one's kind of complicated, so hang on tight.
- First, we need to talk about VP ellipsis.
- Mary bought a record, and Bill did too.
- [_{TP} Mary -ed [_{VP} buy a record]] and [_{TP} Bill -ed [_{VP} buy a record]] too.

VP ellipsis

- Mary bought a record and Bill bought a tape.
≠ Mary bought a record and Bill did too.
- VP ellipsis is allowed *when a preceding VP is identical*.
- To *interpret* this, you need to use the content of the preceding VP.
- Mary bought a record and Bill did (buy a record) too.

VP ellipsis

- We will consider the process of VP ellipsis to be one of *deletion under identity*.
- Underlyingly:
-ed [_{VP} Mary sleep] and -ed [_{VP} Bill sleep] too.
- Before deletion:
Mary -ed [_{VP} t sleep] and Bill -ed [_{VP} t sleep] too
- Pronunciation:
Mary -ed [_{VP} t sleep] and Bill -ed  too
Mary slept and Bill did too

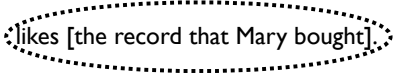
VP ellipsis

- So, as long as two VPs in sequence look identical (where traces of movement look identical to one another—they sound the same), we are allowed to pronounce the second one *very quietly*.
- Like an extreme case of
Mary bought a record and
Bill bought a record too.

VP ellipsis

- Note that *identity* is actually fairly abstract.
- John slept and Mary will too.
- John slept and Mary will sleep too.
- Before deletion:
John -ed [_{VP} t sleep] and Mary will [_{VP} t sleep] too
- The inflectional features of *v* don't matter for identity; the verb doesn't *inherently* have a tense suffix.

VP ellipsis with relative clauses

- Now, consider a DP with a relative clause:
- the record [Op_i that Mary bought t_i].
- Bill likes [the record that Mary bought].
- Bill likes the record that Mary bought and Sue does too.
- Bill likes the record that Mary bought and Sue does (like the record that Mary bought) too.

ACD

- Bill likes every book Mary does.
- Bill [_{VP} likes every book Op_i Mary [_{VP} likes t_i]].
- vP : likes [every book Op Mary likes t]
- vP : likes t
- Those aren't the same. VP ellipsis *shouldn't* work, but yet it does.
- The deleted VP is *contained* in the antecedent VP (*antecedent-contained deletion*)

QR and ACD

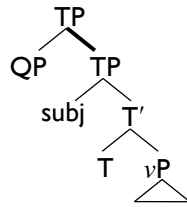
- But now let's consider what QR would do.
- *Every book that Mary likes* is a quantifier.
- Quantifiers have to move up past the subject by LF.
- Bill likes every book Mary does.
- Pronunciation (before covert movement):
Bill [_{VP} likes [every book Op_j Mary [_{VP} likes t_j]]].
- LF:
[every book Op_j Mary [_{VP} likes t_j]]_i Bill [_{VP} likes t_i].
- But now the VPs *are* identical. So QR allows us to explain ACD in a natural way.

Where do quantifiers go?

- Every student left.
- [Every student]_i [_{TP} t_i left]
- We need a variable in subject position, so QR must be moving the quantifier out of TP, to somewhere higher than TP.
- Believe me that it is also moving somewhere *lower* than CP.

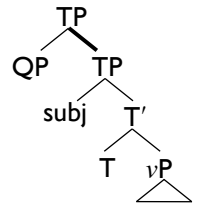
Adjunction to TP

- In order to accommodate this, we need to formulate a new position to which quantifiers move.
- This position is going to be *adjoined to TP*.



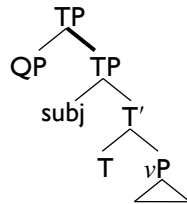
Adjunction to TP

- One difference between QR (adjunction to TP) and movement to SpecTP is in the motivations.
- Moving to SpecTP or moving to SpecCP is motivated by some need of T (EPP:T needs a DP in its specifier) or C ([Q] C needs a [+WH] in its specifier).
- Moving a quantifier (QR) is required because the *quantifier* needs to get out of the TP (for interpretation). TP *itself* has no need for quantifiers.



Adjunction to TP

- So, we could say that moving to Spec is something that happens if the moving thing is *pulled* (T is pulling up a subject to satisfy its own needs, not the needs of the moving subject) or *pushed* (quantifiers move to satisfy their own needs, not the needs of the T).
- An XP that is *pulled up* goes into Spec.
- An XP that is *pushed up* adjoins.



What have we done? What's left to do?

- People have a very complex knowledge of their native language.
- They can distinguish combinations of words on the basis of whether they are or are not part of their language.
- What do they know?
- How do they know it?

What do they know?

- *Rock the put me* is not English.
- Why?
- Well, *the* comes before nouns like *rock*.
- Subjects take a special (nominative) form.
- Verbs like *put* require a putter, a puttee, and a place.

Formalization

- We tried to formulate a model of how English speakers determine what is English.
- We know the words, the words have certain properties (some are verbs, some are ditransitive, etc.).
- Not all possible properties seem to matter for everything. To pronounce *put* we need know that it starts with /p/, but that kind of property doesn't seem to matter for word order. To understand *integer*, we need to know about negative numbers, but this also doesn't seem to matter for syntax.

Formalization

- We observed what properties do seem to matter, and named them as *features*.
- When features combine properly, the result is English.
- Verbs need all of their arguments, subjects and verbs agree.
- So, we formalize “combine properly” as satisfying each lexical item’s requirements. We *check* to be sure the features match.

Formalization

- Because things seem to “move around” (they are in some sense needed in two places in the structure, but are pronounced in only one of them), we hypothesized that some kinds of feature checking needs to happen over very short distances, requiring the addition of another copy of the thing whose feature is being checked up by the matching feature. We called these features “strong” (because they have stronger requirements).

Observation

- From there, we explored some of the kinds of knowledge we have about what makes for a good English sentence.
- Words like *himself* (anaphors) seem to need to be below, but close to, the thing they refer to.
- A class of functional elements (modals, auxiliary *have* and *be*) seem to have to show up somewhere to the left of (above) *not* and adverbs.

How do we know this?

- We also confronted the fact that some of these things seem to be simply unlearnable, or at least not learnable in a way that matches what children actually seem to do.
- Principle A? How does a child know that an antecedent outside the binding domain doesn’t qualify?
- Particularly since other languages (like Japanese) allow anaphors to take long-distance antecedent?

Language variation

- Taking as given that all human languages must be acquirable, and noting that children seem to quickly achieve a level of language knowledge that seems to go beyond what can be simply determined by the input, we look across languages to see what their task needs to entail?
- Properties all languages have can be taken to follow somehow from the structure of the human brain (“principles”). Places where languages differ in constrained ways can be taken to be options “known” to the child and selected among (“parameters”).

What’s left?

- Lots. There’s lots left. Lots and lots.
- We’ve looked at the basic structure of clauses, how they are put together, and how they are embedded within one another.
- We’ve got a foundational sampling of the kinds of things we need to build clauses, and how languages can differ in this.
- But if you pick up a newspaper and read for just a short time, you’ll quickly find sentences we have not yet worked out an analysis for.

What's next?

- For any of these things (e.g., *Pat and Chris left*, **Who did Pat and leave?*, *I want Chris out of my sight*, *I made Pat cry*, *Chris seems angry*, *Pat scrubbed the floor clean/naked*), there are various hypotheses we could advance.
- We look at what these hypotheses would predict elsewhere, look for the simplest hypotheses, and look across languages for similar phenomena to see how languages can and can't differ with respect to what's possible, and whether those differences correlate with other differences in ways that might allow both things to follow from a single parameter.

Syntax II

- One somewhat general trend is that the closer we look at the behavior of areas of the tree, the more fine-grained distinctions we seem to need in order to account for the full range of things people know about the syntax of their language.
- Like the NP which ultimately needed to be made of DP-nP-NP, or the VP which became vP-VP, there's some reason to think that TP and CP also need be "split" into some number of more specific phrases.
- And smart people disagree about what the best analysis is, research continues.

Take-home points

- Human knowledge of language is extraordinarily complex.
- We know a lot, but we do not yet know everything. We have models of this knowledge that are very successful at predicting what is possible, but there are still gaps.