AM2 — Syntax: theories and models
Week 7(2): More on reconstruction

Last week, we finished by observing that not all positions where we find a copy are not possible position where interpretation can happen. Specifically, the fact that we observe a Condition C effect in examples like (1) shows that the highest copy is not available for input to LF (if it was, then *Bob* would not be in the c-command domain of *he*). Reconstruction to a lower position is obligatory.

(1) * [Which picture of Bob_i] did he_i buy?

We can express this restriction as follows.

(2) *Obligatory reconstruction (first version)*
A complex wh- phrase cannot be interpreted in the highest position.

To understand why this is so, consider how questions are formed in a wh- in situ language like Japanese. What we find here is, first of all, that the wh- word remains in the normal argument position; second, that we have a question particle (*ka*) in a high structural position.

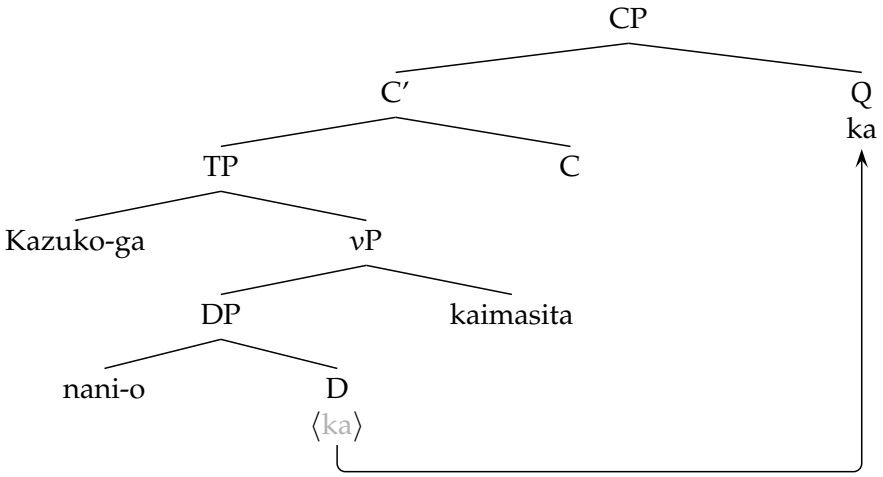
(3) Kazuko-ga nani-o kaimasita ka?
Kazuko.NOM what.ACC bought Q
"What did Kazuko buy?"

The presence of the Q particle is essential. Without it, (3) is interpreted as a regular declarative. Note that, in this case, *nani* doesn't function as a wh- word anymore, but rather as an indefinite.

(4) Kazuko-ga nani-o kaimasita?
Kazuko.NOM what.ACC bought
"Kazuko bought something"

As Cheng (1990) shows, this is a very pervasive pattern in the world's languages. We want to be able to account for this, and the analysis we will follow here is the one in Hagstrom (1998), which you can get from the course website. Hagstrom's analysis is based on the hypothesis that the Q particle starts as a sister of the indefinite/wh- word and then moves to its surface position (there is good evidence for this). Schematically (and ignoring the copy that we should have at the edge of the *v*P phase).

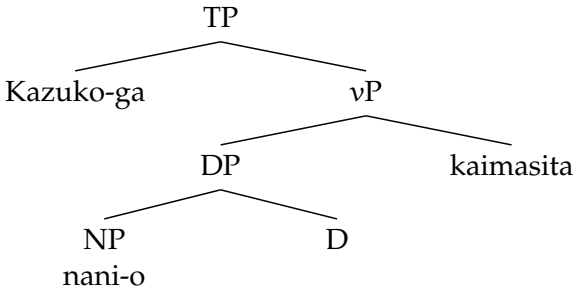
(5) *Hagstrom's representation for (3)*



This representation gets close to what we want, but notice that movement of *ka* is strange in that *ka* is of category Q in the upper position, but of category D in the lower position. Moreover, Hagstrom proposes that *ka* has to be interpreted twice, and in a different way in each position. In the upper position, where it is of category Q, it is an existential quantifier over sets of properties (don't worry about what this means), in the lower position, where it is of category D, it has to be interpreted as a choice function variable (again, don't worry about this). This violates what we would expect from the copy theory of movement. Hagstrom (and after him, Fox 1999) gets around this problem by postulating a process called *Trace Conversion*, but this simply amounts to restating the same problem with fancier words.

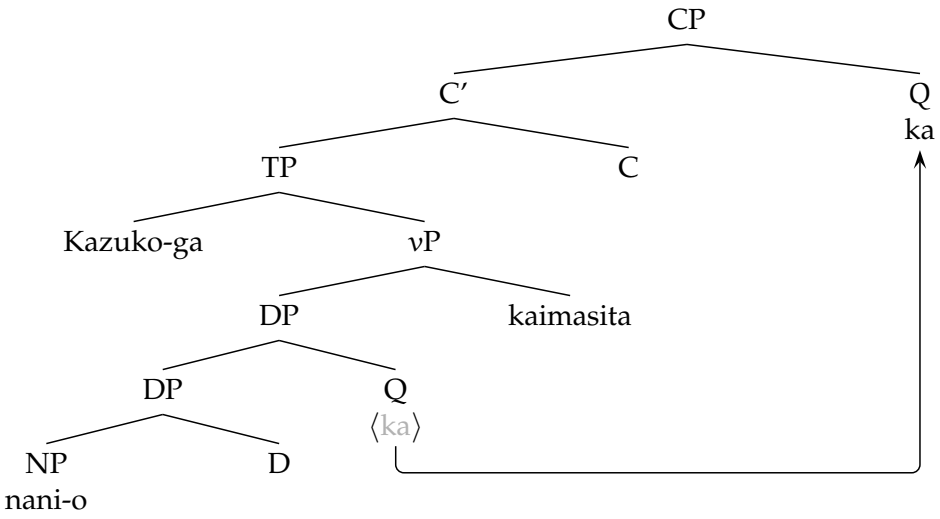
Here I am going to assume the solution in Johnson (2007), where he assumes that indefinites like *nani-(o)* always consist of an NP part (*nani*) and an choice function (the choice function is silent in English, Japanese, and other languages, but Johnson points out that there are some languages where you can actually see it as an independent morpheme). Since a choice function is essentially a determiner, we get a regular DP structure. So, the structure for (4) is as follows.

(6)



A choice function is a function that takes a set of individuals and returns one of them. In this case, *nani* denotes the set of inanimate things, and D returns one of those. This corresponds to the meaning of *something*. To create a question out of this structure, we include a Q morpheme on top of the DP, and then move the Q morpheme away.

(7) *A better representation for (3)*



Now movement of *ka* is consistent with the copy theory of movement. The interrogative meaning comes from the interaction of C and *ka*. The interrogative C is a function that takes a TP containing an indefinite (a proposition) and turns it into the set of all different propositions that can be created by choosing different values for the indefinite. Finally, *ka* retains the role that Hagstrom originally assigned to it —i.e., it is an existential quantifier, which takes sets of propositions as its input and outputs the meaning that at least one of them is true.

If you want to get more details about the semantics, go read Hagstrom (1998). The important thing here is the following:

(8) *Hagstrom's hypothesis*
The creation of the interrogative meaning requires that only the Q particle be interpreted in a high position. If the complement of Q is also interpreted high, then the structure as a whole is semantically uninterpretable.

Now, how do we translate this structure into wh- fronting languages like English or German? Cable (2007) and others have proposed that wh- fronting languages have exactly the same semantics for questions as wh- in situ languages do —that is, in English and German, only the Q particle (which corresponds to the morphemes *wh-* and *w-*, respectively) can be interpreted high. The rest has to be interpreted low. The formalization goes as follows: first, in these languages, the entire DP (containing the Q particle) moves to a high position. This contrasts with wh- in situ languages, where only the Q particle moves. There are various ways of formalizing this difference, but we don't have to worry about this.

(9) $[_{DP}\ [_{Q}$ wh-] D $[_{NP}$ picture of $Bob_i]]$ did he_i buy $\langle[_{DP}\ [_{Q}$ wh-] D $[_{NP}$ picture of $Bob_i]]\rangle$

At PF, the following happens: English and German have a rule to the effect that the entire DP is pronounced in the high position. In this particular case, the Q particle is spelled out as *which* (this can be done through a surfacy morphological rule).

(10) *PF representation of (9)*
$[_{DP}\ [_{Q}$ which] D $[_{NP}$ picture of $Bob_i]]$ did he_i buy $\langle[_{DP}\ [_{Q}$ wh-] D $[_{NP}$ picture of $Bob_i]]\rangle$

What about LF? We don't want the entire DP to be interpreted high, because then we would get a faulty semantics (see (8)). So, Cable and Hagstrom propose that the copy is split: the Q particle is interpreted at the high position, and the rest of the DP is interpreted in a lower position (not necessarily the lowest; just one that is not the highest).

(11) *LF representation of (9)*

[$_{DP}$ [$_{Q}$ which] D [$_{NP}$ picture of Bob$_i$]] did he$_i$ buy ⟨[$_{DP}$ [$_{Q}$ wh-] D [$_{NP}$ picture of Bob$_i$]]⟩

Note that the resulting LF is analogous to the one for Japanese: we have a Q morpheme in a very high position, plus a combination of a choice function and an NP in a low position. We can summarize this idea as follows.

(12) *Syntax and semantics of questions*
Hagstrom's hypothesis (8) applies to all languages.

- In wh- in situ languages, only Q movement happens, so the syntax, the phonology, and the semantics of questions are all closely parallel to each other.
- In wh- fronting languages, DP movement (containing Q) happens. In order to derive the correct semantics (see (8)), there must be a discrepancy between LF (semantics) and PF (phonology), meaning that each component treats copies in a different way. LF requires that the Q morpheme be interpreted high and the rest of the DP be interpreted low; PF requires that the entire DP (including Q) be pronounced high.

The relevant point here is that, as a way to ensuring that the semantics for wh- questions is the right one, a large part of a wh- phrase has to be interpreted low. This is equivalent to (2), which we can now paraphrase as follows.

(13) *Obligatory reconstruction (final version)*
Only the Q particle of a wh- phrase can be interpreted high; the rest has to be interpreted low, even if that results in a Condition C violation.

Or, in a more pithy way.

(14) Obligatory reconstruction follows from a responsible semantics for wh- questions.

So, the moral of today's class is that taking semantics seriously can lead to surprising insights into syntax.