Syntactic movement

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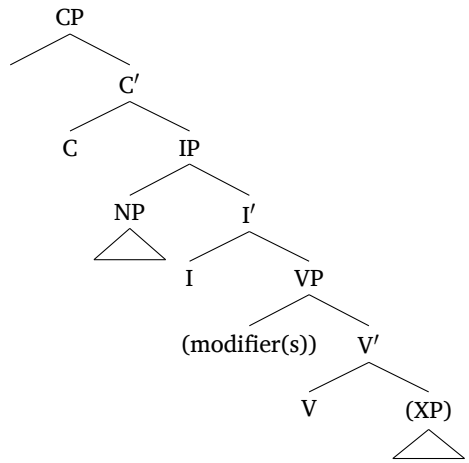
1 Overview and recap

Recall: this is the structure that we have for sentences:

(1)



Where XP *is the complement of the verb; it can be an NP, a PP, or a CP.*

This gives us a neat structure to capture the linear order of English interrogative sentences:

(2) *Yes/No question (closed-ended question)*
  a. The dog will eat the watermelon.
  b. **Will** the dog ___ eat the watermelon?

(3) *Constituent question (open-ended question)*
  a. Rosa has criticized Ana.
  b. **Who has** Rosa ___ cricitized ___?

Hypothesis: auxiliaries and interrogatives phrases (*what*, *which picture*, *etc*) are born in the position that their non-interrogative counterparts occupy and then they are **moved** to C and Spec-CP, respectively.

- **Movement:** an operation that takes a constituent (phrase or head) and places it elsewhere in the sentence.
- Consequence of movement: constituents can be interpreted in one position (*e.g.* complement of VP), but pronounced in another (*e.g.* Spec-CP). This property of languages is called **displacement**.

Formalizing movement

(4) a. Take an element α (word or phrase) and move it to an eligible higher position *P*.
   i. *P* must be empty (no overt morpheme).
   ii. *P* must be a suitable host for the type of element (heads to heads/argument positions, phrases to modifier positions)
   b. Leave behind a trace ____ of the moved element.

This recitation: I will try to provide empirical arguments that *(i)* a moved *Wh*-phrase occupies Spec-CP and that *(ii)* it gets there via movement (instead of being born in Spec-CP).

Exercise #1

A. Draw syntactic structures for the following sentences:

(5) a. What are you listening to?
   b. Did Jamie see the hiker?
   c. Which encyclopedia should a specialist on egg chairs consult?
   d. Where were the children playing?

B. Consider the following sentences:

(6) a. ( ) Who(m) does Rosa visit during Thanksgiving?
   b. ( ) Who(m) Rosa visits during Thanksgiving?
   c. ( ) Who does visit them during Thanksgiving?
   d. ( ) Who visits them during Thanksgiving?

- Provide the judgment for the sentences above.
- Given our rules for constituent question formation, is any of the examples (its (un)grammaticality) surprising?
- Why is this example surprising? Your answer doesn't have to propose an explanation for the sentence, but just a description of it.

2 Motivating movement to Spec-CP

2.1 Evidence for Spec-CP: pronounced complementizer in BP

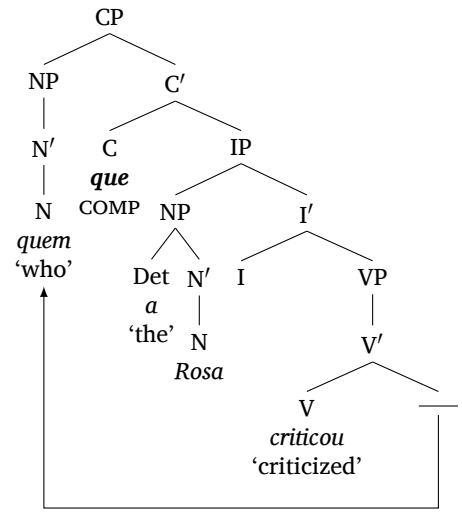
(7) *Brazilian Portuguese: form of the complementizer*
   a. Parece [$_{CP}$ **que** [$_{IP}$ a Rosa criticou a Ana]].
   seems [COMP [the Rosa criticized the Ana]]
   'It seems that Rosa critized Ana.'
   b. Os jornalistas pensam [$_{CP}$ **que** [$_{IP}$ a Rosa criticou a Ana]].
   the journalists think [COMP [the Rosa criticized the Ana]]
   'The journalists think that Rosa criticized Ana.'

(8) *Brazilian Portuguese: constituent questions*

a. Quem **que** a Rosa criticou ___?
who COMP the Rosa criticized
'Who did Rosa criticize?'

b. Quem **que** ___ criticou a Ana?
who COMP criticized the Ana
'Who criticized Ana?'

(9) *Structure for (8a)*



⇒ **Takeaway:** sentences like those in (8) suggest that a moved interrogative phrase occupies the Spec position of a CP, where the CP is headed by a complementizer used in the language.

2.2 Evidence for movement: "partial movement" in German and in French

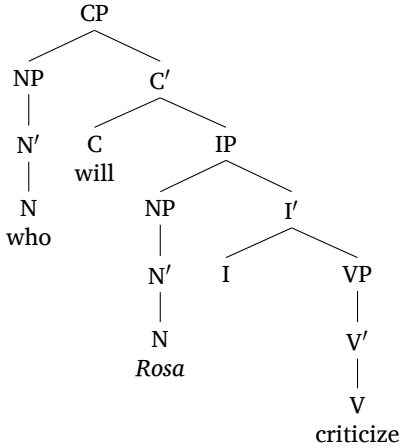
We saw in (4) that the movement operation leaves behind a "trace". Let's assume this just means that the position where a constituent moved from is vacated and therefore empty. As a consequence, it is unpronounced.

However, in a language like English (or Brazilian Portuguese), the trace of movement is basically always empty, so we cannot tell whether the interrogative phrase has ever occupied this position.

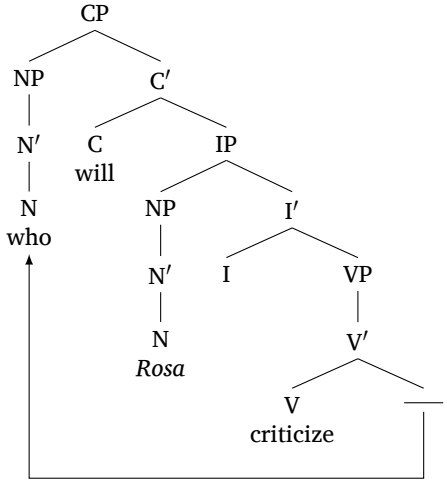
(10) **Who** will Rosa criticize ___?

- **Hypothesis I:** there is no movement of interrogative phrases and the position indicated with ___ in (10) is not pronounced because there is nothing there.
- **Hypothesis II:** there indeed is movement of interrogative phrases and the position indicated with ___ is where *who* in (10) moved from, but ___ is not pronounced because traces of movement happen not to be pronounced.

(11) **Hypothesis I**



(12) **Hypothesis II**



Question

Our focus is how interrogative phrases in a language like English come to be pronounced in the leftmost position in the sentence. Novertheless, abstracting away for a moment from this discussion, there is something that makes (11) undesirable. Consider what we saw about merge and selection: a verb merges with its complement and an auxiliary selects a particular form of the verb (*e.g. have → -ed*)
With this in mind, consider why (11) could be ruled out on independent grounds.

Hypotheses I and II are not really empirically distinguishable here (regarding the linear order of the sentence).

However, in some languages, we can move a smaller constituent that is a subpart of a larger constituent. The remainder of the larger constituent marks the position of the trace ___. We can see this in the following French and German data:[1]

(13) *French*

a. [$_{NP}$ **Combien de livres**] at-il consultés ___?
[how.many of books] has-he consulted
'How many books has he consulted?'

b. **Combien** at-il consultés [$_{NP}$ ___ de livres]?
how.many has-he consulted [of books]
'How many books has he consulted?' (literally, 'How many has he consulted of books')

(14) *German (head-final language)*

a. [$_{NP}$ **Was für Bücher**] hast du ___ gelesen?
[what for books] have you read
'What books did you read?'

b. **Was** hast du [$_{NP}$ ___ **für Bücher**] gelesen?
what have you [for books] read
'What books did you read?' (literally, 'What have you read of books?')

What would Hypotheses I and II say about these data?

- **Hypothesis I:** (13a) and (14a), with an entire NP pronounced in Spec-CP, are unrelated to their counterparts (13b) and (14b), where just an interrogative word is pronounced in Spec-CP.
  - (13a) and (14a) involve an NP being born in Spec-CP, with the complement position of the verb empty.
  - (13b) and (14b) involve an interrogative word being born in Spec-CP, with the complement of the verb now occupied.
- **Hypothesis II:** (13a) and (14a) are related to (13b) and (14b). All the sentences involve an NP being born in the complement position of the verb. The difference lies in what chunk of the NP moves to Spec-CP.

Question

Which hypothesis is preferable?

⇒ **Takeaway:** a movement-based analysis of constituent questions provides a unified account for the French and German data. These data, thus, constitute an indirect argument that interrogative phrases are moved to a higher position, rather than being born there.

[1] Second-hand data adapted from Hornstein, Norbert, Jairo Nunes, and Kleanthes K. Grohmann. *Understanding minimalism*. Cambridge University Press, 2005.

2.3 Evidence for movement: interpretation of reciprocals in English

1st step We are assuming that interrogatives phrases in English (*what, who, etc*). move to Spec-CP. Embedded clauses (clauses that are objects) are also CPs. What happens when the interrogative phrase is born in the embedded clause?

(15) Who does Ravi think [$_{CP}$ that Rosa criticized ___]?

Hypothesis: if an interrogative phrase is born in an embedded CP, it passes through the embedded CP before landing on the highest Spec-CP, where we see it.

(16) **Who** does Ravi think [$_{CP}$ ___ [$_{C'}$ that Rosa criticized ___]]?

2nd step How can we know if this hypothesis is correct? The argument will require an excursus to talk about the reciprocal pronoun *each other*.

(17) a. ( ) There arrived books about **each other**.
b. ( ) Ann and Taylor wrote books about **each other**.

⇒ *Conclusion about a reciprocal like* each other*:*

c. ( ) Taylor wrote books about **each other**.

⇒ *Another conclusion about a reciprocal like* each other*:*

d. ( ) I think [$_{CP}$ that Ann and Taylor wrote books about **each other**].
e. ( ) Ann and Taylor think [$_{CP}$ that I bought books book about **each other**].

⇒ *Another conclusion about a reciprocal like* each other*:*

With this background in place, consider the following pair of sentences:

(18) ( ) Which books about **each other** do Ann and Taylor think [$_{CP}$ that I bought]?

(19) *Representation of (18)*

⇒ **Takeaway:**

- *Which book about each other* in (18) is the complement of the embedded verb *bought*. It must therefore be born in this position.
- *Which book about each other* is pronounced in the topmost Spec-CP. Given our discussion so far, it moves there.
- However, in none of these positions can the reciprocal pronoun *each other* be linked to *Ann and Taylor*.
- But there is a Spec-CP in the intermediate clause too. From that position, *each other* can be linked with *Ann and Taylor*.

- This is another indirect argument for movement, this time to an intermediate position. Without this step, we wouldn't be able to account for how *each other* is linked to *Ann and Taylor*.

Exercise #2

A. Consider the following sentences from German (to recall, a head-final language):

(20) a. Die Besucher denken, [$_{CP}$ dass sie **einen Geist** gesehen haben].
the visitors think [COMP they a.OBJ ghost seen have]
'The visitors think that they saw a ghost.'

b. **Wen** denken die Besucher, [$_{CP}$ **wen** sie gesehen haben?]
who.OBJ think the visitors [who.OBJ they seen have]
'Who do the visitors think that they saw?'

Ignore the following: *(i)* German is a V2 language, which means that the matrix verb has to appear in the 2nd position (more on this below). This may obscure the fact that German is a head-final language; *(ii)* the fact that the complementizer *dass* is head-initial.

- What is special about (20b)?
- Given what we concluded about interrogative phrases that contain a reciprocal, provide a representation of (20b).
- Discuss the relevance of data like (20b) to distinguish between Hypotheses I and II above.

B. The following sentence is reported to be ambiguous:

(21) Which picture of himself did John say that Bill liked best?

The ambiguity is that the picture could be of John or of Bill (*i.e. himself* can be linked to *John* or to *Bill*). Assume that *himself* has the behavior of *each other* above. How could we explain this ambiguity?

(20a) provided by V. Hehl (pers. comm.); (20b) from this textbook: LINK.

3 Head movement

We saw I-to-C movement of auxiliaries in English:

(22) **Will** the dog ___ eat the watermelon?

We can employ the same operation to analyze V2 ('verb second') phenomena in German.[2]

V2 in German: the verb or auxiliary in the main verb has to occupy a second position, following another constituent *XP* that moves to the first position.

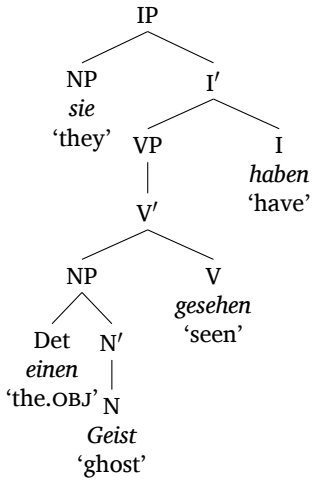
First we have to note that German is a head-final language. We can see this in embedded clauses, where the V2 effect does not apply:

(23) Die Besucher denken, [$_{CP}$ dass sie **einen Geist** gesehen haben].
the visitors think [COMP they a.OBJ ghost seen have]
'The visitors think that they saw a ghost.'

- The object **einen Geist** 'a.OBJ ghost' precedes the main verb gesehen 'seen'.
- The main verb *gesehen* also precedes the auxiliary haben 'have'.

[2]Second-hand German data from a 24.902 (Introduction to Syntax) handout by Prof. David Pesetsky.

(24) *Structure for the embedded IP*



Now consider a simple sentence (no embedded clause) and its variants:

(25) a. XP = *object*
Den **Mann** hat die Frau gestern gesehen.
the.OBJ man has the.SUBJ woman yesterday seen
'The woman saw the man yesterday.'

b. XP = *adverb*
Gestern hat die Frau den Mann gesehen.
yesterday has the.SUBJ woman the.OBJ man seen
'The woman saw the man yesterday.'

c. XP = *subject*
Die **Frau** hat gestern den Mann gesehen.
the.SUBJ woman has yesterday the.OBJ man seen
'The woman saw the man yesterday.'

We have enough clause structure to accommodate these movements:

- The verb in second position moves to C.
- The *XP* that occupies that first position moves to Spec-CP.

(25′) a. XP = *object*
[$_{CP}$ **Denn Mann** [$_{C'}$ hat [$_{IP}$ die Frau gestern ___ gesehen ___]]]?

b. XP = *adverb*
[$_{CP}$ **Gestern** [$_{C'}$ hat [$_{IP}$ die Frau ___ den Mann gesehen ___]]]?

c. XP = *subject*
[$_{CP}$ **Die Frau** [$_{C'}$ hat [$_{IP}$ ___ gestern Denn Mann gesehen ___]]]?

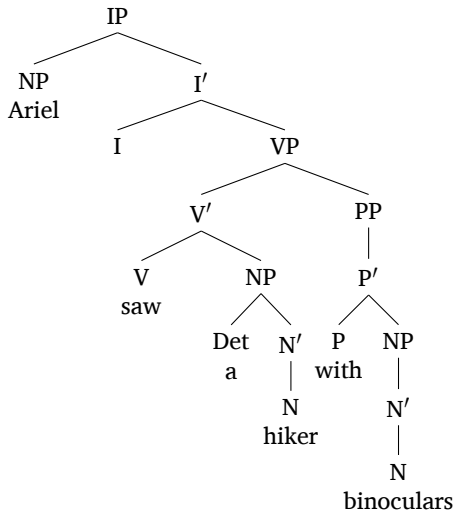
⇒ **Takeaway:** With our tools, we are able to account for V2 phenomena in German. The relevant tools are: movement and the general structure for a sentence, which includes a CP layer, with a head and a Spec position.

4 Restrictions on movement

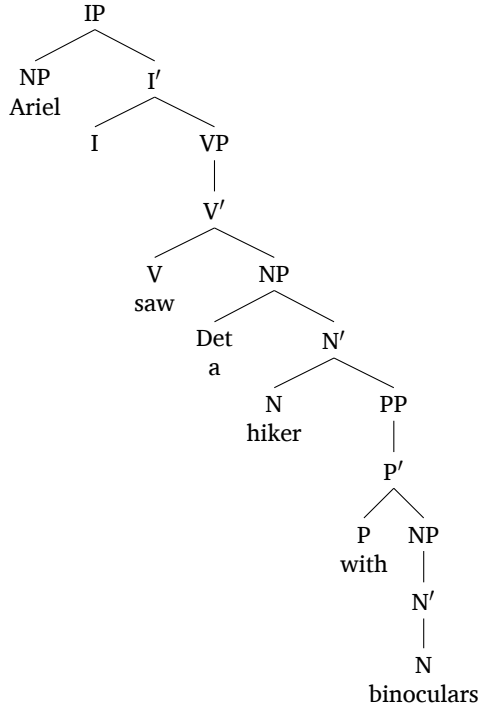
We had the following ambiguous sentence in the last recitation:

(26) Ariel saw a hiker with binoculars.

(27) a.



b.



It seems reasonable to assume that *with binoculars* in (26) is a prepositional phrase (PP, [$_{PP}$ with [$_{NP}$ binoculars]]) in both readings and corresponding structures.

As such, our constituent tests should be able to target this PP in both structures underlying (26), since it should be a constituent in both.

However, the topicalization and fragment question tests are unambiguous:

(28) Ariel saw a hiker with binoculars.

a. [$_{PP}$ With binoculars], Ariel saw a hiker.

Only reading available:

b. With what did Ariel saw a hiker? [$_{PP}$ With binoculars].

Only reading available:

In order to understand the disappearence of ambiguity in the sentences above after the application of a constituent diagnostic, consider the following sentences:

(29) *Complement/Embedded clause*

a. ( ) Rosa thinks [that a child was playing with a jigsaw puzzle].

b. ( ) With a jigsaw puzzle, Rosa thinks [that a child was playing ___].

(30) *Relative clause*

a. ( ) Rosa admires the child [who is playing with a jigsaw puzzle].

b. ( ) With a jigsaw puzzle, Rosa admires the child [who is playing ___].

(31) *Subject clause*

a. ( ) [That the child is playing with a jigsaw puzzle] is surprising.

b. ( ) With a jigsaw puzzle, [that the child is playing ___] is surprising.

(32) *Conditional clause*

a. ( ) [If the child is playing with a jigsaw puzzle], Rosa will be happy.

b. ( ) With a jigsaw puzzle, [if the child is playing ___], Rosa will be happy.

Claim: we cannot move constituents from just any chunk of the syntactic structure. There are certain types of clauses where we cannot move a constituent from: A. Relative clauses (30); B. Subject clauses (31); C. Conditional clauses (32).

These structures are called **islands**.

With this background in mind, let's go back to the fact that, after topicalization, (26) only has a reading where Ariel uses the binoculars to see the hiker.

Assume that topicalization is a type of movement that targets CP, just like interrogative phrases.

(33) With binoculars, Ariel saw a hiker.

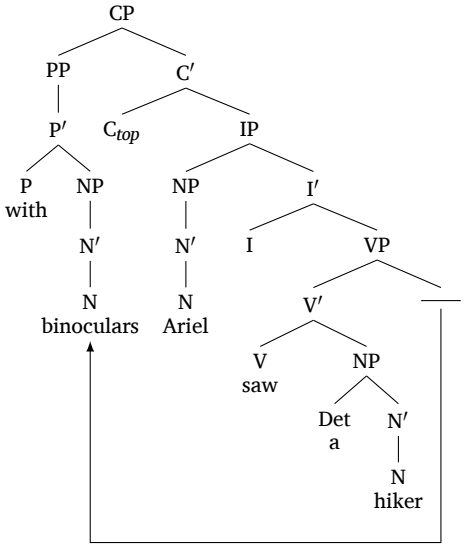
How could we explain the unavailability of the reading where the hiker has the binoculars? (30) is a relevant case:

- A relative clause like that in (30) is an NP modifier.
- The PP *with binoculars* is also an NP modifier in the reading of (26) where the hiker has the binoculars – see (27b).

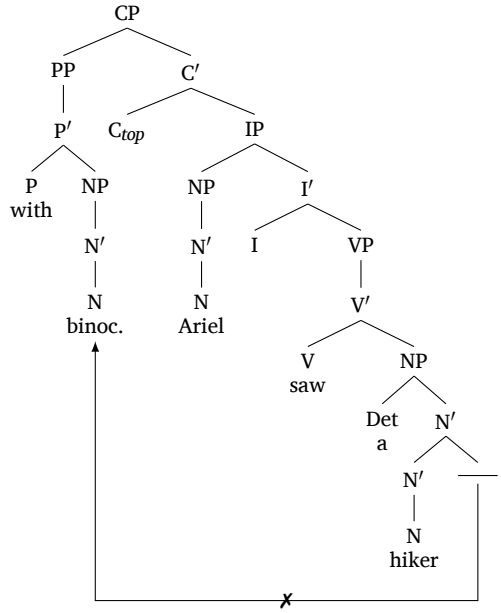
Hypothesis: Modified NPs are islands for movement.

We can now provide an explanation as to why (33) is unambiguous:

(34) *With binoculars, Ariel saw a hiker.*
(*i.e.* binoculars as an instrument of seeing)



(35) * *With binoculars, Ariel saw a hiker.*
(*i.e.* the hiker had the binoculars)



Exercise #3

A. If you speak a language other than English, try to construct the equivalent ungrammatical sentences where topicalization proceeds from an island and see if they are also ungrammatical.
B. Recall that we had seen some Mongolian data in the beginning of the semester:

(36) a. Bat changaar [$_{CP}$ **nokhoi** gaikhaltai gej] khelsen.
Bat loudly [dog.SUBJ wonderful COMP] said
'Bat said loudly that dogs are wonderful.'

b. Bat **nokhoi-g** changaar [$_{CP}$ gaikhaltai gej]khelsen.
Bat dog-OBJ loudly [wonderful COMP] said
'Bat said loudly that dogs are wonderful.'

The challenge introduced by (36b) is how *nokhoi* 'dog' can both be interpreted as the *subject* of the embedded clause and be pronounced inside the main clause. Additionally, it is marked with morphology dedicated for *objects* (*-g*).
This is **displacement**, defined in the beginning. We have an appropriate tool for that, movement. It is possible that *nokhoi* is pronounced inside the matrix clause because it moves there. How can we know if this hypothesis is correct?
It was mentioned in class that (36b) could be equivalent to an English sentence like the following:

(37) Mary knows about **the dog** that, if he plays too much, he will get tired.

However, a parallel construction in Mongolian is ungrammatical:

(38) a. Bat changaar [**Odgerel** üdeshiilichd ilbechin ur-val, Och baylan gej] khelsen.
Bat loudly [Odgerel.SUBJ to.party magician invite-if Och be.happy.FUT COMP] said
'Bat said loudly that, if Odgerel invites a magician to the party, Och will be happy.'

b. * Bat **Odgerel-iig** changaar [üdeshiilichd ilbechin ur-val, Och baylan gej] khelsen.
Bat Odgerel-OBJ loudly [to.party magician invite-if Och be.happy-FUT COMP] said
Intended: 'Bat said loudly that, if Odgerel invites a magician to the party, Och will be happy.'

Bearing in mind what we saw about islands above, compare (37) and (38b). Based on this comparison, discuss whether a movement analysis of the Mongolian sentences (36b) and (38b) would be empirically adequate.