Intro to Syntax, PART SIX

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EGG 2009 / COST-A33, Poznań

wh-Movement

Why movement?

- When discussing *selection*, we observed that for **some** verbs, the complement is optional:

(1) a. John has [$_{VP}$ eaten [$_{DP}$ the apple]].
b. John has [$_{VP}$ eaten].

- We also observed, however, this is not true for all verbs:

(2) a. John has [$_{VP}$ devoured [$_{DP}$ the apple]].
b. * John has [$_{VP}$ devoured].

  - It seems that the verb *devour* — unlike *eat*, for example — **demands** that its complement (a DP) be present

- This is systematic — regardless of the tense of the sentence, the *person*/*number* features of the subject, etc.:

  [The notation **(blah)* means that the utterance is **ungrammatical** without *blah*, but **grammatical** if *blah* is present — hence the asterisk is **outside** the parentheses. Similarly, there exists the opposite notation, *(*blah)*.]

(3) a. John has devoured *(the apple). *[=(2)]*
b. John is devouring *(the apple).
c. John will devour *(the apple).
d. John devoured *(the apple).
e. We have devoured *(the apple).

➢ Given this, the felicity of (4) could be considered somewhat surprising:

(4) What has John devoured?

- So what's going on?
  - It's an age-old insight that this requirement — which is satisfied by *the apple* in examples like (3a–e) — is satisfied by *what* in (4)

Why movement?

- BUT: there is obviously an important difference between an example like (3a) and an example like (4)

(3) a. John has devoured the apple.

(4) What has John devoured?

  - In (4), the element satisfying the requirement — i.e., *what* — is in the "wrong place", w.r.t. the element imposing the requirement (*devour*)

  ➢ In fact, we can put *what* **arbitrarily far away** from *devour*, and still somehow satisfy *devour*'s requirement to have a complement:

(5) a. **What** has John devoured ____?

b. **What** does Mary think that John devoured ____?

c. **What** did Bill notice that Mary thought that John devoured ____?

d. **What** did Susan mention that Bill noticed that Mary thought that John devoured ____?

⋮ ⋮

Why movement?

- This is what we call ***movement***
  - The phenomenon where a single syntactic element affects the utterance in more than once place

(5) a. **What** has John devoured ____?
b. **What** does Mary think that John devoured ____?
c. **What** did Bill notice that Mary thought that John devoured ____?
d. **What** did Susan mention that Bill noticed that Mary thought that John devoured ____?
⋮ ⋮

- In examples like (5a–d):
  (i) *what* satisfies the verb *devour*'s requirement to have a complement
  (ii) but *what* is pronounced at the beginning of the sentence
- TERMINOLOGY: the "missing" complement of *devour*, in a sentence that is nonetheless grammatical, is called a ***gap***

What moves?

➢ We've seen movement of *what*; what else can move?

(6) a. [Which apples] has John devoured ____?
b. [Which apples from the farm] has John devoured ____?
c. [Which delicious red apples from the farm] has John devoured ____?

⇒ It looks like what's moving is a *phrase* (i.e., an XP)

- This suggests that *what* itself is **also** a *phrase*
- That's not too surprising, for at least two reasons:

I. If *what* can satisfy *devour*'s requirement to have a complement, it must be a phrase
   - REMEMBER: **all** complements are phrases, by definition

II. RECALL: there are other instances where a single word can act as a phrase (e.g., DP), such as pronouns:

(7) John devoured <u>it</u>.

What moves?

- These moving phrases share another property with *what*:

(8) a. [What] has John devoured ____? *[=(4)]*
b. [Who] has Mary seen ____?
c. [Which apples from the farm] has John devoured ____? *[=(6c)]*
d. [Where] has Bill gone _____?

➢ It seems that the moving element, in these questions, is a phrase headed by a word that bears a particular kind of morphology
⇒ these words are known as ***wh-words*** or ***wh-elements***
– even though some of them don't even contain "*wh*" (e.g., *how*)!
∘ and the phrases that they head are known as ***wh-phrases***

Where to?

- What position does the moving phrase move to?
  - The *wh*-phrase moves **past the subject** — as in, e.g., (4), repeated here:

(4) What has John devoured ____?

➢ There's also the issue of the auxiliary verb (*has*) showing up on the "wrong side" of the subject
  - We'll get to that in another class, but note that:

(i) There are many languages that have the same kind of movement (of a "*wh*-phrase"), without any verbs changing their position

(ii) Even within English, this phenomenon only occurs in unembedded clauses; compare (4) with (9a–b):

(9) a. * Mary forgot [what has John devoured ____].
b. Mary forgot [what John has devoured ____].

⇒ In the interest of not dealing with too many variables at once, let us concentrate on the movement of the *wh*-phrase, for the time being

- Empirically, this amounts to only looking at embedded question (again, for the time being; we'll get back to this soon)

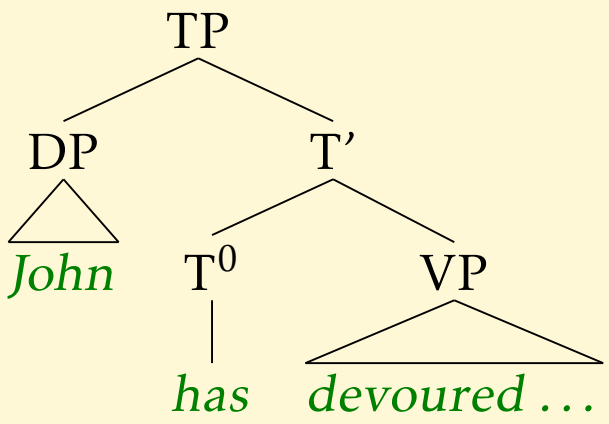
➢ In embedded questions just like unembedded (a.k.a., "matrix") ones, the *wh*-phrase moves past the subject:

(10) Mary wondered [what John has devoured ____]?

- The "subject" of a sentence is located in [Spec,TP]:

(as argued in detail in an earlier class)

(11)



Where to?

- If the *wh*-phrase moves past the subject — what is there **past** TP?
  - We have already met the category *C(omplementizer)*
    - the head that *Merges* with (and "introduces") embedded clauses
    - encodes the ***illocutionary force*** of a clause ("clause-typing")
      - e.g., whether the clause represents an assertion (*that John left*) or a question (*whether John left*)
  - In our current terms, C^0 ***selects*** TP as its ***complement***
  - RECALL: the moving element is a *phrase*
    - given the *X'-schema*, ***complements*** and ***specifiers*** are positions for phrases, while ***heads*** are positions for… well, heads

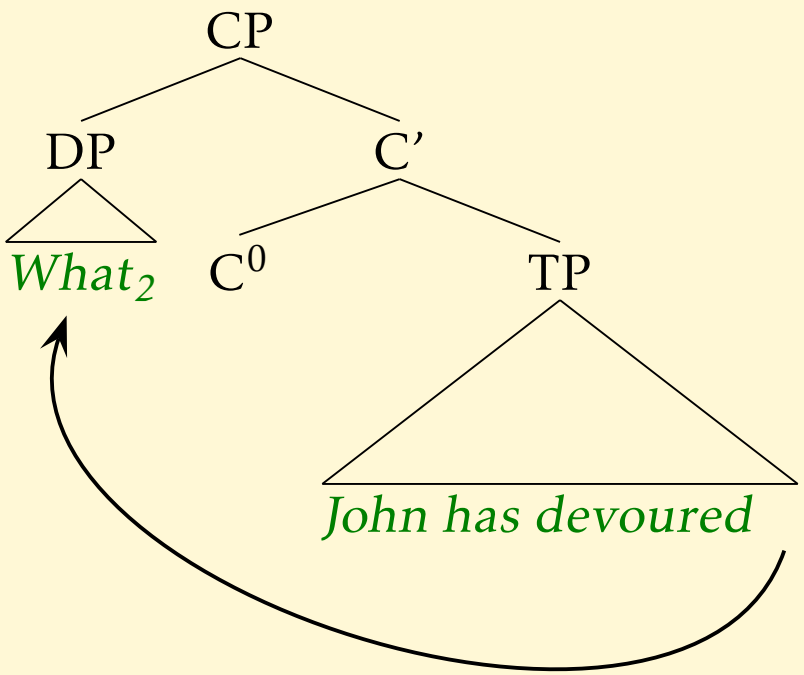
    ⇒ the moving phrase must move to a ***complement*** or ***specifier*** of some XP

Where to?

- Possibilities:
  - the specifier of TP is occupied (by the "subject")
  - the complement of C^0 is occupied (by TP itself)
  - the specifier of CP is... vacant!
  - ➢ the *wh*-phrase can move to [Spec,CP]
- Moreover, we have already seen that CP is the projection responsible for encoding ***illocutionary force*** ("clause-typing")
  - ⇒ it makes a certain kind of sense for CP to be the projection relevant to the movement of *wh*-phrases

(12) $[_{CP}$ What $[_{C'}$ C^0 $[_{TP}$ John has devoured]]]?

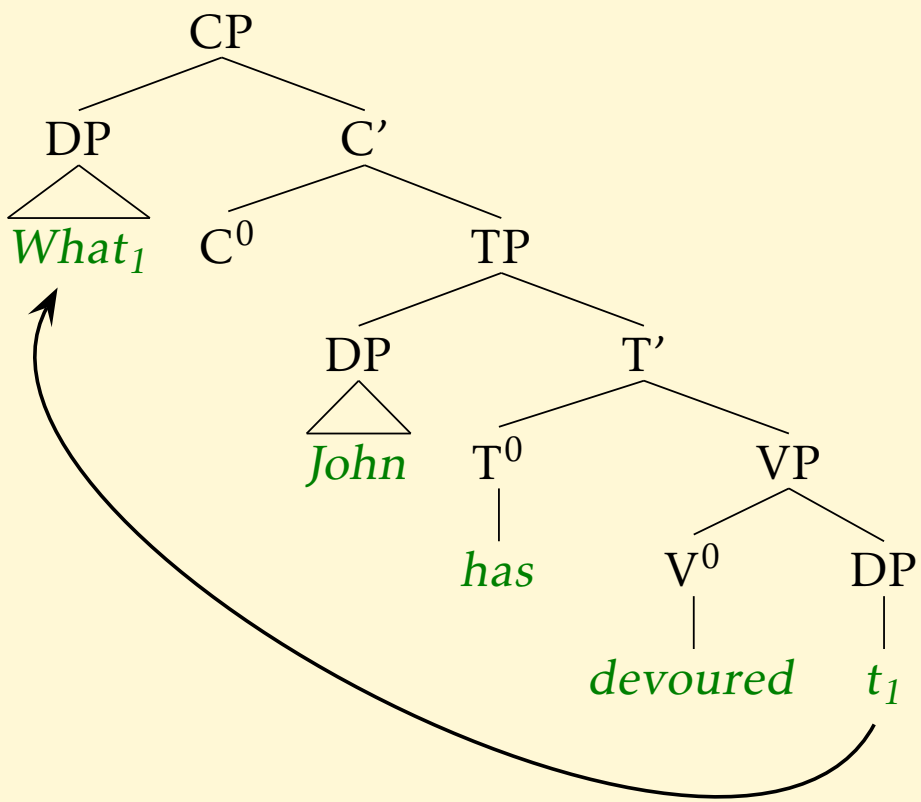
(13)



- To make it easier to track which element moved from which position, we will use a notation called *traces*:
  - we mark each moving element with an index
  - and leave a 't' with the same index in the ***gap*** (the position from which the element moved)

(14) $[_{CP}$ What$_1$ $[_{C'}$ C^0 $[_{TP}$ John has devoured t$_1$]]]?

(15)



Constraints on wh-movement

What wh-movement can (and cannot) do

- We've already seen that movement can apply at great distances
  - i.e., the ***gap*** and the moving element can be arbitrarily far away from each other
    - as demonstrated in (5), repeated here as (16)

(16) a. **What$_1$** has John devoured **t$_1$**?
b. **What$_1$** does Mary think that John devoured **t$_1$**?
c. **What$_1$** did Bill notice that Mary thought that John devoured **t$_1$**?
d. **What$_1$** did Susan mention that Bill noticed that Mary thought that John devoured **t$_1$**?
⋮ ⋮

- This might lead to the expectation that movement — at least, movement of a *wh*-phrase in interrogatives — is unconstrained
  - i.e., that you can move a *wh*-phrase from anywhere in the sentence to [Spec,CP]

What wh-movement can (and cannot) do

- Interestingly, this expectation is not borne out:
  - Consider the declarative sentence in (17a–b) — embedded in (17b), and unembedded in (17a):

(17) a. John knows the guy who brought the pizza.

b. Mary remembered [that John knows the guy who brought the pizza].

  - Suppose we want to build a question about *the pizza*
    - i.e., we want to know:
      "for which x is it the case that *John knows the guy who brought* x"
      - and we don't know that *the pizza* is the x that would make that statement true

(18) a. * What_1 does John know the guy who brought t_1?

b. * Mary wondered [what_1 John knows the guy who brought t_1]?

What wh-movement can (and cannot) do

- This is remarkable, given that — as shown earlier —the question we are trying to create is logically coherent:

(19) for which *x* is it the case that *John knows the guy who brought x*

- Perhaps more strikingly, no language that forms its questions this way — by moving a *wh*-phrase to [Spec,CP] — can form the question in (18)

(20) a. Dani makir et ha-baxur še-hevi et ha-pica (Hebrew)
Dani knows ACC the-guy that-brought ACC the-pizza
'Dani knows the guy who brought the pizza.'

b. * (et) ma_1 Dani makir et ha-baxur še-hevi t_1?
(ACC) what Dani knows ACC the-guy that-brought
'*What$_1$ does Dani know the guy who brought t_1?'

➢ **NOTE:** this is not to say, of course, that asking a question with the meaning in (19) is impossible

- This can be done by means of a paraphrase

What wh-movement can (and cannot) do

(21) a. What$_1$ did the guy who John knows bring t$_1$?

b. Mary wondered [what the guy who John knows brought t$_1$]?

- The point is not that language has no way of asking a question with the logical representation in (19) (repeated here):

(19) for which x is it the case that *John knows the guy who brought* x

➢ The point is that — for some reason — language cannot do so on the basis of the declarative(s) in (17) (also repeated here):

(17) a. John knows the guy who brought the pizza.

b. Mary remembered [that John knows the guy who brought the pizza].

- There are numerous examples of this sort
  - i.e., instances of *wh*-movement that are, for whatever reasons, robustly and cross-linguistically ruled out

➢ these are known as syntactic ***islands***
  - imagine that *wh*-phrases can't swim… *(thanks, Norvin Richards!)*

To help us try and make sense of this, we will classify these ***islands*** into several major "types":

- ***ADJUNCT ISLAND***

(22) a. [Which party]$_1$ did you go [to t_1]? *(baseline)*

b. * [Which party]$_1$ did you meet John [after t_1]? *(island-effect)*

  - an adjunct cannot be extracted from — (22b)
    - cf. a complement, which can be extracted from — (22a)

- ***SUBJECT ISLAND***

(23) a. Who$_1$ did you buy [a picture of t$_1$]? *(baseline)*

b. * Who$_1$ did [a picture of t$_1$] fall on your head? *(island-effect)*

- a DP in "subject" position cannot be extracted from — (23b)
  - cf. a DP in "object" position (a complement to V^0) — (23a)

➢ actually, the same is true for CPs:

(24) a. Who$_1$ did you think [that we should hire t$_1$]? *(baseline)*

b. * Who$_1$ did [that we hired t$_1$] surprise you? *(island-effect)*

- a CP in "subject" position cannot be extracted from — (24b)
  - cf. a CP in "object" position (a complement to V^0) — (24a)
- this sub-case is sometimes called the ***SENTENTIAL SUBJECT ISLAND***
  - the reason why it deserves this "special treatment" is mostly historical; we have not yet seen any reason for this

- ***COMPLEX-NP CONSTRAINT* (CNPC)**

(25) a. What$_1$ do you believe [$_{CP}$ that John bought t$_1$]? *(baseline)*

b. * What$_1$ do you believe [$_{DP}$ the [$_{NP}$ claim [$_{CP}$ that John bought t$_1$]]]? *(island-effect)*

- a CP dominated by an NP/DP node cannot be extracted from — (25b)
  - cf. a CP not dominated by an NP/DP node — (25a)

- ***COORDINATE-STRUCTURE CONSTRAINT* (CSC)**

(26) a. What$_1$ did they [eat t$_1$]? *(baseline #1)*

b. What$_1$ did they [[eat t$_1$] and [drink t$_1$]]? *(baseline #2)*

c. * What$_1$ did they [[eat t$_1$] and [drink milk]]? *(island-effect)*

- extracting out of one of two coordinated XPs is impossible — (26c)
  - though extracting "simultaneously" out of both is okay — (26b)
    - the latter is known as *Across-the-Board* (or *ATB*) movement

- ***WH-ISLAND***

(27) a. [Which shelf]$_1$ did Mary say [that she should put the book on t_1]?
(baseline)

b. * [Which shelf]$_1$ did Mary ask [which book she should put on t_1]?
(island-effect)

- an interrogative CP (i.e., a question) cannot be extracted from

➢ **NOTICE:** given what we know now, the representation of (27b) is missing something

(28) [Which shelf]$_2$ did Mary ask [[which book]$_1$ she should put t_1 on t_2]?

– this could provide us some insight into what, exactly, goes wrong in (27b)/(28)

⇒ **keep this in mind!**

A word about relative clauses

- Another thing to notice is that examples like (18a) (repeated here) actually violate two or three(!) different island constraints:

(18) a. * What$_1$ does John know [$_{DP}$ the [$_{NP}$ [$_{NP}$ guy] [who brought t$_1$]]]?

  - The phrase *who brought the pizza* in a DP like *[$_{DP}$ the guy who brought the pizza]* is called a *relative clause*
  - without going into the analysis of *relative clauses* — that could **easily** be a whole course, unto itself — notice:
    - a relative clause can be added to (almost) any noun
      - i.e., relative clauses are not *selected* by the noun
    - relative clauses cannot be ordered closer-to-the-head than *arguments*:

(29) a. the student [of physics]$_{arg}$ [who I saw yesterday]$_{RC}$

b. * the student [who I saw yesterday]$_{RC}$ [of physics]$_{arg}$

A word about relative clauses

⇒ relative clauses are *adjuncts*

– in terms of their category, relative clauses look like they are (at least) CPs

· in fact, within a relative clause we find a kind of movement that is very similar to *wh*-movement in questions

(30) the student [$_{CP}$ who$_1$ [$_{TP}$ I saw yesterday t$_1$]]

(it looks like this movement targets [Spec,CP], as well)

➢ Looking again at (18a):

(18) a. * What$_1$ does John know [$_{DP}$ the [$_{NP}$ [$_{NP}$ guy] [who brought t$_1$]]]?

- the movement of *what* in (18a) violates:
  - **(i)** adjunct island
  - **(ii)** complex-NP constraint (CNPC)
  - **(iii)** *wh*-island(?)

- In general, overlapping causes like this are not a good sign (in terms of the "health" of the theory)
  - they often suggest that there is some deeper generalization that we are currently missing
- **BUT:** if it is true that the ungrammaticality of (18a) feels "worse" than the ungrammaticality of cases where fewer islands are violated —
  - then the multiplicity of violations is has some support

Other constraints on wh-movement

There are other constraints on *wh*-movement, which we may or may not want to list as part of our list of ***islands***:

- ***Left-Branch Condition (LBC)***

(31) a. [Whose book about linguistics]$_1$ did you read t$_1$? *(baseline #1)*

b. What$_1$ did you read [a book about t$_1$]? *(baseline #2)*

c. * [Whose]$_1$ did you read a [t$_1$ book]? *(island-effect)*

- in English, extracting the *specifier* ("left branch") out of a DP is impossible
  - as is, probably, extracting anything from within that specifier
- the reason the LBC is not listed with the other islands is that it is rather English-specific:

(32) Jaki$_1$ Paweł kupił swojej żonie [t$_1$ samochód]? (Polish)
what Paweł-NOM bought his wife-DAT car
'What car did Paweł buy his wife?' *[Wiland 2008]*

Other constraints on wh-movement

In contrast to the LBC — which is operative in English but inoperative in many other languages — here is a constraint that is operative in most languages, but not in English:

- ***Pied-Piping vs. Preposition-Stranding***
  - In English, when a *wh*-phrase is the complement of a P^0, there are two options for "what moves"

(33) a. What$_1$ did you place the cover [on t$_1$]? *(preposition-stranding)*

b. [On what]$_1$ did you place the cover t$_1$? *(pied-piping)*

- the name ***pied-piping*** is a reference to the fairy tale of *the Pied Piper of Hamelin*
  - the idea being that the *wh*-word, like the Pied Piper, is forcing other things to follow it

Other constraints on wh-movement

- However, as mentioned earlier, many (most?) languages don't allow ***preposition-stranding***, only ***pied-piping***:

(34) a. [al ma]$_1$ sam-ta et ha-kisuy t$_1$? (Hebrew)
on what put.2sg.MASC ACC the-cover
'[On what]$_1$ did you place the cover t$_1$?'

b. * ma$_1$ sam-ta et ha-kisuy [al t$_1$]?
what put.2sg.MASC ACC the-cover on

➢ In other words, in many languages (but not English), PP is an island

- All of the examples that we've been looking at (except for the ungrammatical example demonstrating a *WH-ISLAND*) have contained a single *wh*-phrase
- There is another kind of question, however, involving more than one *wh*-phrase

(35) a. Who ate what?

b. Who does Mary think ate what?

c. Who did John convince to buy what?

- In questions like (35a–c), the speaker is asking for answers consisting of *pairs* — e.g.:

(36) a. Bill ate apples, Peter ate bananas, Bob ate oranges, . . .

b. (Mary thinks that . . .)
Bill ate apples, Peter ate bananas, Bob ate oranges, . . .

c. (John convinced . . .)
Bill to buy shoes, Peter to buy jewelry, Bob to buy a car, . . .

⇒ these are sometimes known as *Pair-List* questions

- because the answer is a list of *pairs*

- Actually, there is nothing that restricts them to *pairs*, per se:

(37) a. Who gave what to whom?

b. John gave a ball to Bill, Mary gave a book to Sue, ...

- These multiple-*wh* questions exhibit a curious property
  - consider, for example, (35b) — repeated here:

(35) b. Who does Mary think ate what?

➢ Only one of the *wh*-phrases moves

- Attempting to move both of them results in ungrammaticality, whichever way they are arranged:

  (38) a. * Who what does Mary think ate?

  b. * What who does Mary think ate?

- **NOTE:** this is not true in every language — not even in every language that forms questions by moving *wh*-phrases to the beginning of the sentence
  - Bulgarian and Serbo-Croatian, for example, allow multiple *wh*-phrases to undergo movement in a *Pair-List* question (see Richards 2001)

- Even more curiously, it's not enough that exactly one *wh*-phrase moves; it seems to matter which one it is:

(39) a. Who does Mary think ate what? *[=(35b)]*

b. * What does Mary think who ate?

➢ This is particularly puzzling, because it seems *what* is not trapped inside an ***island*** in (39b)

- How do we know?
- If we replace the (other) *wh*-element with another DP, *what* is able to move freely:

(40) What does Mary think Bill ate?

⇒ there is nothing about the **position** of *what* in (39b) that prevents it from moving

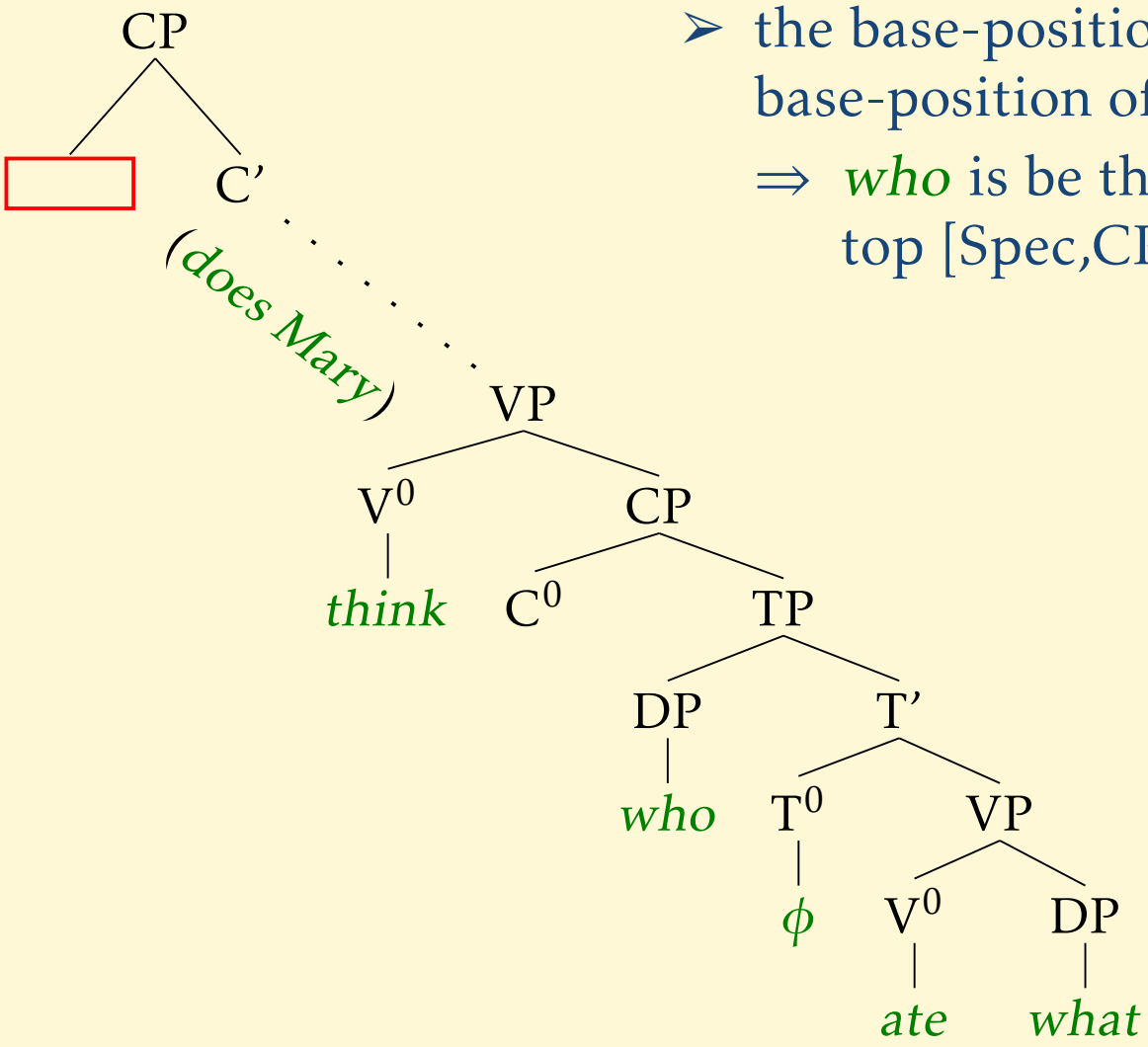
➢ What is it, then, that causes (39b) (repeated here) to be ungrammatical?

(39) b. * What does Mary think who ate?

SUPERIORITY (subject to revision)

If α and β are two candidates for movement into the same position, and α c-commands β, then α must be the one that moves

(41)



- the base-position of *who* *c-commands* the base-position of *what*
  - ⇒ *who* is be the one that must move to the top [Spec,CP]

Summary

- We've seen various constraints on *wh*-movement:
  - islands
    - adjunct island
    - subject island
      - sentential subject island
    - complex-NP constraint (CNPC)
    - coordinate-structure constraint (CSC)
    - *wh*-island
  - other constraints, subject to more cross-linguistic variation
    - Left-Branch Condition (LBC)
    - pied-piping vs. preposition-stranding (i.e., the islandhood of PPs)
    - *that*-trace effect
  - superiority

Summary

- These constraints may be just that — a list of different phenomena that all constraint the movement of *wh*-phrases
- However, it is certainly tempting to at least **try** to find ways to unify some (if not all) of these into more general principles
  - and these attempts have been one of the most lively areas of syntactic theory over the last 25 years

More movement(?)

- Consider *relative clauses*, once more:

(42) a. The guy [that wrote the book].
b. The guy [who wrote the book].

- The presence of a *wh*-element at the periphery of the relative clause in (42b) suggests that **movement** might be involved

➢ How might we further test this hypothesis?

- First, of course, an English TP can't just begin with *wrote*:

(43) a. * [$_{TP}$ Wrote the book].
b. * Mary knows that [$_{TP}$ wrote the book].
⋮ ⋮

➢ Perhaps more interestingly, it turns out that this ***gap*** that exists in a relative clause, cannot itself be within an **island**:

(44) a. * the book [which John [[read ____] and [drank coffee]]]
[coordinate-structure constraint (CSC)]

b. * the book [which [a review of ____] annoyed John]
[subject island]

c. * the book [which John read [the review [that criticized ____]]]
[complex-NP constraint (CNPC)]

- **NOTICE:** The same facts demonstrated in (44a–c) hold if the *wh*-element (*which*, in (44a–c)) is replaced with *that*

(45) a. * the book [that John [[read ____] and [drank coffee]]]
[coordinate-structure constraint (CSC)]

b. * the book [that [a review of ____] annoyed John]
[subject island]

c. * the book [that John read [the review [that criticized ____]]]
[complex-NP constraint (CNPC)]

⇒ this suggests that regardless of whether the relative clause has *that* or a *wh*-element at its periphery, its derivation involves **movement**

➢ **CONSIDER:** if movement was not involved in (44–45), it would be a rather suspicious coincidence that they exhibit the same constraints on where the gap can/cannot appear, as *wh*-questions do

More movement(?)

More generally:

- We can think of these island-constraints as *movement-detectors*
- We've seen this for relative clauses; here's another example:

(46) This book is tough to read ____.

(47) a. * This book is tough to read [an article [that criticizes ____]].
[complex-NP constraint (CNPC)]

b. * This book is tough to think [that [reading ____] would annoy you].
[subject island]

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