

Intro to Syntax, PART SIX

Omer Preminger, *MIT*

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| | |
|--|-----------|
| wh-Movement | 2 |
| Why movement? | 3 |
| What moves? | 7 |
| Where to? | 9 |
| Constraints on wh-movement | 15 |
| What wh-movement can (and cannot) do. | 16 |
| Islands. | 20 |
| A word about relative clauses | 24 |
| Other constraints on wh-movement | 27 |
| Superiority | 30 |
| Summary | 36 |
| More movement(?)..... | 38 |
| References | 42 |

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

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Omer Preminger, MIT**Why movement?**

- 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)

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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 it.

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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***

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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 ____].

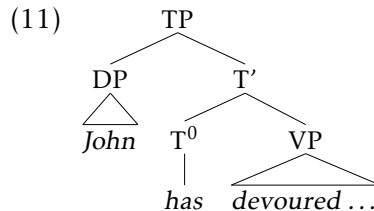
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Where to?

- ⇒ 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)



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Where to?

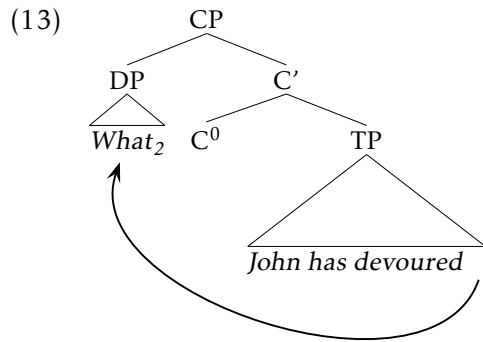
- If the *wh*-phrase moves past the subject — what is there **past** TP?
 - We have already met the category *C* (*complementizer*)
 - the head that *Merges* with (and “introduces”) embedded clauses
 - encodes the ***illocutionary force*** of a clause (“clause-typing”)
 - e.g., whether the clause represents 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

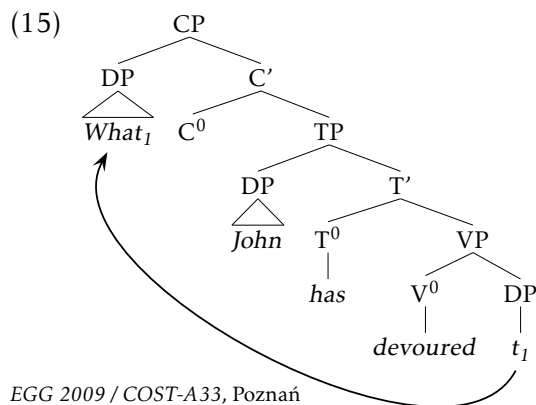
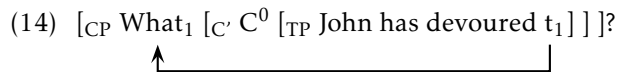
(12) [_{CP} What [_{C'} C^0 [_{TP} John has devoured]]]?
↑

Where to?



- 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)

Where to?



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]

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Omer Preminger, MIT – 16 / 42**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 [what₁ John knows the guy who brought **t**₁]?

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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
'*What₁ 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

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What *wh*-movement can (and cannot) do

(21) a. What₁ 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].

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Islands

- 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)

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Islands

- **SUBJECT ISLAND**

- (23) a. Who₁ did you buy [a picture of t₁]? (baseline)
b. * Who₁ did [a picture of t₁] fall on your head? (island-effect)
- o a DP in “subject” position cannot be extracted from — (23b)
 - cf. a DP in “object” position (a complement to V⁰) — (23a)
 - ▶ actually, the same is true for CPs:
- (24) a. Who₁ did you think [that we should hire t₁]? (baseline)
b. * Who₁ did [that we hired t₁] surprise you? (island-effect)
- o a CP in “subject” position cannot be extracted from — (24b)
 - cf. a CP in “object” position (a complement to V⁰) — (24a)
 - o 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

Islands

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

- (25) a. What₁ do you believe [CP that John bought t₁]? (baseline)
b. * What₁ do you believe [DP the [NP claim [CP that John bought t₁]]]? (island-effect)
- o 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. What₁ did they [eat t₁]? (baseline #1)
b. What₁ did they [[eat t₁] and [drink t₁]]? (baseline #2)
c. * What₁ did they [[eat t₁] and [drink milk]]? (island-effect)
- o 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

Islands

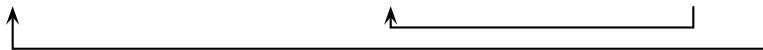
- **WH-ISLAND**

(27) a. [Which shelf]₁ did Mary say [that she should put the book on t₁]? (baseline)

b. * [Which shelf]₁ did Mary ask [which book she should put on t₁]? (island-effect)

o 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 t₁ on t₂]?


– 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. * What₁ does John know [DP the [NP [NP guy] [who brought t₁]]]?

o The phrase *who brought the pizza* in a DP like [DP the guy who brought the pizza] is called a *relative clause*

o 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 who₁ [TP I saw yesterday t₁]]

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

A word about relative clauses

► Looking again at (18a):

(18) a. * What_{t₁} does John know [DP the [NP [NP guy] [who brought t₁]]]?

- 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

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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 t₁? (baseline #1)
b. What_{t₁} did you read [a book about t₁]? (baseline #2)
c. * [Whose]₁ did you read a [t₁ 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) Jaki₁ Paweł kupił swojej żonie [t₁ samochód]? (Polish)
what Paweł-NOM bought his wife-DAT car
‘What car did Paweł buy his wife?’ [Wiland 2008]

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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. What₁ did you place the cover [on t₁]? (*preposition-stranding*)
b. [On what]₁ did you place the cover t₁? (*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

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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 t₁? (Hebrew)
on what put.2sg.MASC ACC the-cover
‘[On what]₁ did you place the cover t₁?’
b. * ma₁ sam-ta et ha-kisuy [al t₁]?
what put.2sg.MASC ACC the-cover on

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

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Superiority

- 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, ...

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Superiority

⇒ 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, ...

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Superiority

- 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)

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Superiority

- 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

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Superiority

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

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

SUPERIORITY (subject to revision)

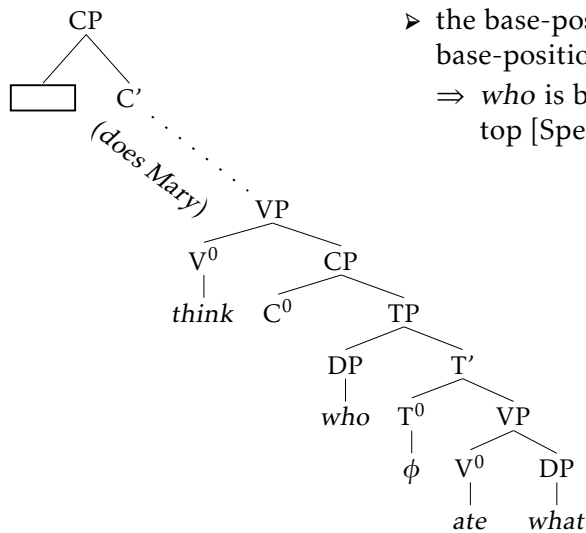
If α and β are two candidates for movement into the same position, and α c-commands β , then α must be the one that moves

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Superiority

(41)



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

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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

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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

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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?

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More movement(?)

- 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)]

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More movement(?)

- **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]

References

42 / 42

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