

## Class 8 summary: *wh*-movement

*This is a lightly edited version of the summary I used last Fall for the 2-3 classes on this topic I taught in my ungraduate intro class at MIT.*

*As such, it contains lots of material that we did not cover in the two hours we devoted to this topic, but I thought you might like to have the extra material available. The material that we did not cover is in blue.*

*I have tried to edit the summary so it does not have irrelevant remarks relevant only to last Fall's version — forgive me if I missed any ("as we saw on Thursday...")*

*Also the order of presentation is a bit different from what I did in the last LSA class — Dinka comes much later, for example — but the content is all there.*

### 1. *Wh*-movement in *wh*-questions

A *wh*-question is a sentence that crucially contains somewhere in it a *wh*-word. The term *wh*-word needs a proper semantic definition, which this summary will not offer. Words that are informally identifiable as *wh*-words are found across the languages of the world — but the semantics of these elements is a complex and controversial topic.

Informally, when speakers ask a *wh*-question like *What did Bill read?* they **presuppose** that Bill read something, and a felicitous response to the question states the identity of the thing read. The element whose identity the speaker is trying to learn is given by the *wh*-word.

In English, we can recognize a *wh*-word by the fact that it helps trigger *wh*-movement (yes I know that's circular) and, in general, by the presence of the *wh*-morpheme /h<sup>w</sup>/ (English).<sup>1</sup> The term *wh*-phrase is generally used even when discussing languages in which the relevant morpheme has an entirely different shape (or even no constant form whatsoever).

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### *Wh*-movement

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<sup>1</sup> For many speakers, the initial /h/ drops, except when the syllable nucleus contains /u/ or its glide counterpart /w/, in which case — for all speakers — the /w/ drops. This accounts for the pronunciation of *what*, *where*, *when*, *why*, *which* vs. *who* and *how* (underlyingly /h<sup>w</sup>aw/; it should be spelled *whow!*)

In many languages — English being one of them — a *wh*-question typically involves movement. Movement applies to a phrase that contains the *wh*-word (sometimes a phrase consisting of the *wh*-word alone; more on this topic below).

We can tell that *wh*-questions involve movement in several ways:

- **It leaves a gap filled by an expression containing a *wh*-word** (Recall that the verbs *put* and *devour* require an NP object.)

- (1) a. What did Sue put \_\_ on the table?  
b. Who did the monster devour \_\_ today?

- **The position before movement counts for Binding Theory.** (This phenomenon is often called *reconstruction*.)

- (2) [How much criticism of herself<sub>i</sub>] can Mary<sub>i</sub> tolerate \_\_? *Principle (A)*

Crucially, the anaphor *herself* really behaves as though the phrase that contains it is in the direct object position. For example, if *Mary* does not c-command *herself* before movement, the result is bad, as seen in (3):

- (3) \*[How much criticism of herself<sub>i</sub>] can [Mary<sub>i</sub>'s brother] tolerate \_\_?

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### Where does the *wh*-phrase move to?

This question is related to another question. In main clauses, in Standard English, *wh*-movement regularly co-occurs with movement of the highest auxiliary verb (*did* in (1a-b), for example). We also need to ask where the auxiliary verb is moving to.

What we observe is that the *wh*-phrase moves to a left-peripheral position in CP. Only one phrase moves in this manner. When a question contains two *wh*-phrases, for example, only one moves:

- (4) a. [**What**] did Mary put \_\_ on [**which table**]?  
b. \***[What] [which table]** did Mary put \_\_ on \_\_?

A good guess as to the identity of a unique position left-peripheral in CP that can receive a *wh*-phrase is **Specifier of CP**. And a good guess as to the landing site for the auxiliary verb is **C** itself (but we already knew that from earlier classes and from 24.900).

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### What's the mechanism by which *wh*-phrases move to specifier of CP?

- A feature of C (call it C's **+wh** feature) requires interrogative C to take a *wh*-specifier.

We may think of this as an **EPP-type property**, an issue to which I return below.

**What's the mechanism by which T moves to C in matrix (i.e. main-clause) questions?**

- The C of main-clause questions has another property (we might call it a [+T] feature) which requires T to move to it as well.
- C of embedded questions does not have this feature in standard English, but does in many dialects, and is common in conversational "standard" English as well:

(5) % Mary wanted to know [what did Bill say about her]?

In (5), the presence of *her* in the embedded clause, if coreferent with *Mary*, indicates that we are dealing with a true embedded clause — not with a quote, which would have to look like (6):

(6) Mary wanted to know, "What did Bill say about me?"

- Also in Indian English, matrix interrogative C does not necessarily have the [+T] feature.

(7) **Indian English main-clause questions**

- a. What this is made from?
- b. Who you have come to see?

[source: Trudgill and Hannah (1994) *International English*. London: Arnold. p.132]<sup>2</sup>

<sup>2</sup> Trudgill and Hannah seem to imply that the facts of Indian English are simply reversed from the US/UK standard -- that inversion is obligatory in embedded clauses and impossible in main clauses. I'm not sure if that is what they are saying, nor am I sure that it's true.

**2. The +wh feature on C: feature-driven movement**

**Why does *wh*-movement obligatorily take place in the complements of certain verbs like *wonder*?**

That is, *wonder* does not allow a declarative *that*-clause as its complement (except, perhaps, with the meaning "marvel at", in archaic English, irrelevant to us here):

(8) \*Bill wondered [that Mary had eaten fish for dinner].

Just as *wonder* requires *wh*-movement in its CP complement, so a verb like *believe* forbids it:

(9) \*Bill believed [what Mary had eaten \_\_ for dinner].<sup>3</sup>

— and *know* allows both options:

- (10) a. Bill knew [that Mary had eaten fish for dinner].  
b. Bill wondered [what Mary had eaten \_\_ for dinner].

This looks like **subcategorization** by *wonder* for the +Wh feature on the head of its CP complement and subcategorization by *believe* for a C without this feature (or with a negative value for the feature) — with *know* showing both options:

(11) **Subcategorization properties of *wonder*, *believe* and *know***

- wonder*: [+ \_\_ [C, +Wh] ]
- believe*: [+ \_\_ [C, -Wh] ]
- know*: [+ \_\_ [C, ±Wh] ]

If this view is correct, a verb like *wonder* does not directly *wh*-movement in its complement (which would not be subcategorization as we know it). Instead, the requirement arises indirectly as follows:

- A verb like *wonder* subcategorizes for an interrogative C with a +Wh feature.
- C with this feature attracts a *wh*-phrase to it.
- If one tried to merge *wonder* with a CP in which *wh*-movement had not occurred (as is the case in (8)), the derivation would be violating either the subcategorization property of *wonder* or the requirements of this +Wh feature.

<sup>3</sup> The idiom *can't believe* does allow a CP complement with *wh*-movement (*Bill can't believe what Mary ate for dinner*) -- interpreted as an exclamation, though, not a question. We put these cases aside.

### 3. The Doubly-Filled Comp filter

#### Why is C null with embedded *wh*-movement? Why can't it be pronounced?

- This seems to be a language-specific phenomenon. In modern Standard English, C must be null whenever its specifier is *non-null*. But in other languages and some dialects of English, including older stages of the language, this restriction does not hold:

- (12) a. Ik weet niet *wie* of Jan gezien heeft. [Dutch]  
I know not who if John seen has
- b. men shal wel knowe *who that* I am [Middle English]
- c. Je me demande quand *que* Pierre est parti. [colloquial French]  
I wonder when that Pierre has left

- The language-specific restriction is called the *Doubly-Filled COMP Filter*.

- (13) **Doubly-Filled COMP Filter** [language-specific]  
The phonologically null variant of C is obligatory unless the specifier of CP is phonologically null.

Note that an auxiliary verb in C does not count as a "variant of C".

### 4. Pied-piping

#### What's a "*wh*-phrase"?

That is, what besides the *wh*-word may undergo movement to an interrogative C?

- Sometimes other material *must* accompany the *wh*-word. For example, in English the D *which* cannot move on its own. It must take the NP (N') with it:
- (14) **English is strict: NP (N') must accompany D**
- a. [<sub>NP</sub>Which book] did Mary buy \_\_\_?  
b. \*Which did Mary buy [<sub>DP</sub> \_\_\_ book]?

There is cross-language variation on this matter. For example, Russian is more permissive than English with respect to the phenomenon in (14). Russian does not require pied-piping of NP (N') along with the D *which*. Both examples in (15) are fine:

- (15) **Russian is permissive: NP (N') need not accompany D**
- a. Kakuju knigu Marija kupila?  
which book Mary bought
- b. Kakuju Marija kupila \_\_\_ knigu?

In other cases, English is the more permissive language. For example, English allows *stranding* of a preposition when its object undergoes *wh*-movement<sup>4</sup> — but Russian does not:

- (16) **English is permissive: P need not accompany its complement**
- a. [<sub>PP</sub> To [<sub>DP</sub> whom]] did Mary speak?  
b. [<sub>DP</sub> Who] did Mary speak to [<sub>PP</sub> to \_\_\_]?
- (17) **Russian is strict: P must accompany its complement**
- a. [<sub>PP</sub> S [<sub>DP</sub> kem]] Marija razgovarivala \_\_\_?  
with whom Mary spoke
- b. \*<sub>[DP Kem]</sub> Marija razgovarivala [<sub>PP</sub> s [<sub>DP</sub> \_\_\_]] ?

The phenomenon in which a phrase bigger than the *wh*-word undergoes *wh*-movement is called **pied-piping**, a fanciful term due to J.R. Ross's famous 1967 MIT dissertation *Constraints on Variables in Syntax*. The reference is to the German folk-tale about the piper whose pipe could call all the rats of the city — and, alas, ultimately all the children of the city — after it:

*He advanced to the council-table:  
And, "Please your honours," said he, "I'm able,  
"By means of a secret charm, to draw  
"All creatures living beneath the sun,  
"That creep or swim or fly or run,  
"After me so as you never saw!  
"And I chiefly use my charm  
"On creatures that do people harm,  
"The mole and toad and newt and viper;  
"And people call me the Pied Piper."  
from "The Pied Piper of Hamelin" by Robert Browning*

The absence of pied-piping seen in (16b) is called *preposition stranding*.

<sup>4</sup> This is sometimes frowned upon by stylists and English teachers, but has been a part of the language for millennia. It does seem to be a rather rare property cross-linguistically, however. It is common in the Germanic languages (all the Scandinavian languages allow it, and Dutch, German and Frisian allow it with restrictions). Outside of Germanic, languages that permit preposition stranding include Prince Edward Island

French, Gbadi, and Vata (with postpositions only) — so few non-Germanic languages seem to have it. I am quoting here from a paper by Juliet Stanton, who in turn is citing a University of Connecticut dissertation by Klaus Abels on preposition stranding.

There are significant restrictions on pied-piping in English that we spent some time examining in class. For example, though virtually any phrase whose left-most member is a *wh*-word can be pied-piped, no matter how deeply embedded that word is, as seen in (18):

- (18) I wonder ...
- ... who Mary should invite \_\_\_\_.
  - ... whose friend Mary should invite \_\_\_\_.
  - ... whose friend's brother Mary should invite \_\_\_\_.
  - ... whose friend's brother's teacher Mary should invite?
- 
- ... how many people Mary should invite \_\_\_\_.
  - ... how many people's friends Mary should invite \_\_\_\_.  
*etc.*
- 
- ... which people Mary should invite \_\_\_\_.
  - ... which people's friends Mary should invite \_\_\_\_.  
*etc.*

— **pied-piping of a phrase in which the *wh*-word is not leftmost is not possible** (in an embedded question, at least):

- (19) I wonder...
- ... who Mary will read a book about \_\_\_\_.
  - ... \*a book about whom Mary will read.
  - ... \*a book about whose friend Mary will read.  
*etc.*
- 
- ... \*a rumor that Mary visited whom Mary has heard.  
*etc.*

— with one salient exception: **a phrase that begins with a preposition acts as if the preposition were not there**. So long as the complement of P has a *wh*-word at its left edge, the result can be pied piped:

- (20) I wonder...
- ... with whom Mary should talk \_\_\_\_.
  - ... with whose friend Mary should talk \_\_\_\_.
  - ... with whose friend's brother Mary should talk \_\_\_\_.
  - ... with whose friend's brother's teacher Mary should talk \_\_\_\_.
- 
- ... at how many people Mary should look \_\_\_\_ (before deciding who to photograph).
  - ... at how many people's friends Mary should look \_\_\_\_...  
*etc.*
- 
- ... for which people we should undertake this task \_\_\_\_.  
*etc.*

In class, we did not try to figure out any particularly interesting explanation for these facts (though Justin did make an interesting proposal that relied on c-command by D rather than being leftmost). We merely observed the facts, so you would be aware that there are laws governing pied-piping. We did not try to explain them. But this is a *very* interesting topic, and if we had more time, I would have definitely told you more! (Google "Seth Cable pied-piping", for example, to get a sense of one of the more important recent ideas.)

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## 5. Relative clauses

- A relative clause is a CP that functions as an NP or DP modifier, and is a sister of N' or D' — like any of the adjectives or PP modifiers that we examined earlier in the semester:

- (21) [DP The person [CP who I invited \_\_\_\_]] liked [DP the food [CP which I cooked \_\_\_\_]].
- ↑
↑
- relative clause*
*relative clause*

- Inside the relative clause, we find something like *wh*-movement (including pied-piping) — **but with a slightly different set of *wh*-words**. In particular, *what* and *how* are excluded (in Standard English, at least):

- (22) a. \*the book what I was reading  
b. \*the way how I solved the problem

- We can assume that a variant of the +Wh feature seen in questions — we can call it **+REL** — triggers *wh*-movement here, seeking out a *wh*-word of the sort that may occur in a relative clause. Note that relative clauses, being modifiers, are not subcategorized for, and are optional.

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- There are three types of (restrictive) relative clauses in English:**

- (23) a. the person who I invited...  
b. the person that I invited...  
c. the person I invited...

- These all probably involve some kind of *wh*-movement, since they all have gaps in them:**

- (24) a. the book which I put \_\_\_\_ on the table  
b. the book that I put \_\_\_\_ on the table  
c. the book I put \_\_\_\_ on the table

- **The *wh*-phrase may not co-occur with an overt C:**

(25) \*the book which that I put \_\_ on the table

#### Ingredients of an analysis:

1. C is either phonologically overt *that* or phonologically null C ( $\emptyset_C$ ) in a finite relative clause. The idea of this alternation was not just cooked up for relative clauses, of course. We have both possibilities even in complement CPs (*Mary believes that/ $\emptyset_C$  the world is round*.)
2. The Doubly Filled COMP Filter holds in relative clauses, just as it does in questions.
3. English has phonologically null versions of *who* and *what*, which we can call  $\emptyset_{REL}$ .

#### How it works:

- Pick *that* as C, and the *wh*-phrase must be null, to avoid violating the Doubly Filled COMP filter. This yields (23b) and (24b).
- Pick  $\emptyset$  as C, and the *wh*-phrase can be null or pronounced — since there's no possibility of violating the Doubly Filled COMP filter.

With pronounced *wh*-phrase, this yields (23a) and (24a).  
 With null *who* or *what*, this yields (23c) and (24c).

#### And it works splendidly!

- (26) **The three options (relativizing the object)**
- a. the person **who**  $\emptyset_C$  I invited \_\_...
  - b. the person  $\emptyset_{REL}$  **that** I invited \_\_ ...<sup>5</sup>
  - c. the person  $\emptyset_{REL}$   $\emptyset$  I invited \_\_...
  - d. \*the person **who that** I invited \_\_... [\* by Doubly Filled Comp Filter]

Well, almost... There's no null  $\emptyset_{REL}$  counterpart to pied-piped PP, which we have just stipulated:

- (27) **One option only (pied-piping of PP):**
- a. the chair **[in which]**  $\emptyset_C$  I was sitting \_\_\_\_
  - ==> b. \*the chair  $\emptyset_{REL}$  **that** I was sitting \_\_\_\_
  - ==> c. \*the chair  $\emptyset_{REL}$   $\emptyset_C$  I was sitting \_\_\_\_
  - d. \*the chair **[in which] that** I was sitting \_\_\_\_ [\*by Doubly Filled Comp Filter]

<sup>5</sup> Note that the word *that* here is *not* a "relative pronoun" here. It is a complementizer, no matter what you might have heard elsewhere. As we saw in class, for example, there is nothing like pied-piping with *that*-relatives. The "relative pronoun" (i.e. the relative *wh*-word) is null. (Tom's South Dakota judgments, however, suggest that for him, *that* might have an alternative life as a relative pronoun.)

Thus, there is only one type of relative clause when pied piping has taking place, rather than three.<sup>6</sup> Compare the counterpart in which the preposition is stranded, which behaves just like (26):

- (28) **The three options once more (P-stranding)**
- a. the chair **which**  $\emptyset_C$  I was sitting in \_\_\_\_
  - b. the chair  $\emptyset_{REL}$  **that** I was sitting in \_\_ ...
  - c. the chair  $\emptyset_{REL}$   $\emptyset$  I was sitting in \_\_\_\_
  - d. \*the chair **which that** I was sitting in \_\_\_\_ [\* by Doubly Filled Comp Filter]

## 6. Restrictive vs. non-restrictive relative clauses

Here too we did not spend much time trying to figure out deep explanations, but I wanted you to be aware of the following facts.

English relative clauses come in two general flavors, **restrictive** and **non-restrictive** (also called **appositive**):

- (29) a. The kids who John invited got lollipops. [restrictive]  
 b. The kids, who John invited, got lollipops. [non-restrictive]

#### Two properties of non-restrictive relative clauses that distinguish them from restrictive relative clauses:

1. They are separated by a pause ("comma intonation") from the rest of the sentence;<sup>7</sup>
2. They provide "extra information" about the phrase they modify, and are not strictly necessary to determining the referent of the DP as a whole

- (30) **How to force a restrictive relative clause reading (in case you ever have to):**
- a. *Attach the relative clause to a proper name*  
 Mary, who John invited to the movies...
  - b. *Add phrases like "by the way"*  
 these kids, who, by the way, John invited to the movies...

<sup>6</sup> Also,  $\emptyset_{REL}$  itself may not be the object of a preposition: \**the chair in  $\emptyset_{REL}$  I was sitting* — as Luke noticed in class.

<sup>7</sup> Interestingly, this is apparently not true in all languages. For example, Japanese, though it has non-restrictive relative clauses, is said not to distinguish them intonationally from restrictive relatives.

### Something I forgot to tell you in class:

- (31) **Restrictive relatives follow all non-restrictive relatives...**
- the kids that Mary described in her newspaper article, who -- by the way -- John invited to the movies...
  - \*the kids, who -- by the way -- John invited to the movies, that Mary described in her newspaper article...
- ... a fact that can be understood if non-restrictive relatives are DP-level modifiers (sisters of D'), and restrictive relatives are NP-level modifiers (sisters of N').

### And something that I mentioned only briefly in class, but this is the reason I brought the topic up in the first place:

For most speakers,  $\emptyset_C$  is unavailable in non-restrictive relatives. In this respect, they act like the relative clauses with pied-piping seen in (27):

- (32) **One option only (non-restrictive relative):**
- Mary [who]  $\emptyset_C$  John invited \_\_\_\_
  - \*Mary  $\emptyset_{REL}$  that John invited \_\_\_\_
  - \*Mary  $\emptyset_{REL}$   $\emptyset_C$  John invited \_\_\_\_
  - \*Mary [who] that John invited \_\_\_\_ [\*by Doubly Filled Comp Filter]

We now leave relative clauses for a while. An obvious missing piece in our story is *why*  $\emptyset_{REL}$  is unavailable in various environments (including relative clauses built on the subject, even when restrictive: \**The person met you is my friend*). The plot thickens if we extend our gaze to other languages, but alas, not in this class...

## 7. Multiple Questions: more evidence for feature-driven movement

### What is a multiple question?

A **multiple question** is a question that contains more than one *wh*-word. Typically, the answer to a multiple question is a set of sentences in which each of the *wh*-words is replaced by an appropriate non-*wh* expression that makes the answer true.

Example:

- (33) a. **Question:** Who bought what?  
**Answer:** *Mary* bought *the book*, *John* bought the *calculator*, Sue bought the *computer*, etc.
- b. **Question:** Who did you persuade to read what?  
**Answer:** I persuaded *Mary* to read *War and Peace*, I persuaded *John* to read *Anna Karenina*, and I persuaded Sue to read *Crime and Punishment*, etc.<sup>8</sup>

#### Terminology: "*wh-in-situ*"

A *wh*-phrase that does not undergo *wh*-movement is said to remain *in situ*, and is sometimes referred to as ***wh-in-situ***.

In a multiple question in *English*, as we saw above, one *wh*-phrase undergoes *wh*-movement. Other *wh*-phrases remain in situ.

This means that before *wh*-movement takes place in a multiple question, there is more than one *wh*-phrase that potentially could undergo *wh*-movement. One might think there would be freedom in choosing which one. In fact, there is normally no such freedom.

- (34) **The "Superiority Effect"**  
 When IP contains two *wh*-phrases, and one c-commands the other, the one that undergoes *wh*-movement is the one closest to the interrogative C.<sup>9</sup>

Here are some examples:

- (35) **Superiority effect: subject vs. object**
- Who \_\_ bought what?
  - \*What did who buy \_\_?
- (36) **Superiority effect: higher object vs. lower object**
- Who did you persuade \_\_ to read what?
  - \*What did you persuade whom to read \_\_?

The existence of the Superiority effect suggests that it is a feature on C that picks what *wh* moves to it. We can view the feature acting as a **probe**, hunting down the tree and picking the first *wh*-phrase it finds (the **goal**) as the one that will be its specifier via movement. We call this the "**Attract Closest**" property of movement:

<sup>8</sup> Russian novels. I recommend them.

<sup>9</sup> There are exceptions that have been studied. For example, when instead of *who* and *what* we have such phrases as *which person* and *which book*, many speakers find that the Superiority effect disappears or at least weakens.

(37) **Attract Closest**

When a head attracts a phrase with a particular property to its specifier, it picks the closest phrase with that property.

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**If we had more time...**

... I would develop the important observation we discussed briefly: that the "Attract Closest" property actually holds of every instance of movement that we have discussed. For example:

- When T attracts a DP from the specifier of VP, it always attracts the highest one: the external argument if that exists, or the highest internal argument.
- Likewise for all the instances of head movement that we discussed: V-to-T (always moves the highest of a bunch of auxiliary verbs if there are any, and only moves the main verb if there's no auxiliary and T-to-C.

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**And if we had even more time...**

... I would have told you that the model I am sketching here is associated with research in the so-called *Minimalist Program*. The name comes from a 1993 paper (and 1995 book) by Noam Chomsky, and reflects work done by a number of researchers over the past two decades or so. There are other approaches that differ to varying degrees from Minimalism.

- A lexical item (a head) is made of features (properties).
- Some of these features -- called *uninterpretable features* (notated with a little *u*) -- are "active". What this means is explained in the next bullet.
- An uninterpretable feature acts as a **probe** (as just described), looking down the tree for the *closest* matching instance of the same feature -- called a **goal**. (The relationship between probe and goal is called **agreement**, and sometimes expresses itself as morphological agreement.)
- If the probe also has a [generalized version of the] **EPP property**, some constituent that contains the goal will move to the probe, forming a specifier of the probe.
- **In *wh*-movement, the probe is the uninterpretable *Q*-feature (or *R*-feature) of C.**

**In a nutshell:**

**Step 1:**

If the head has an uninterpretable feature *uF*, it acts as a probe, looks down the tree for a goal. If probe is successful --> **agree**.

**Step 2:**

If *uF* is also +EPP --> **movement**.

Wait a minute! (I hear you saying.) We don't see morphological agreement between C and *wh* in English. True, but we do in Kinande and some other languages:

(38) **Wh-C agreement in Kinande (Bantu, NE Congo)**

a. IyondI yO kambale alangIra.  
who (cl.1) that (cl.1)Kambale saw

b. aBahI Bo kambale alangIra.  
who (cl.2) that (cl.2) Kambale saw

c. EkIhI kyO kambale alangIra.  
what (cl.7) that (cl.7) Kambale saw  
(Schneider-Zioga 1987; quoted in Rizzi 1990)

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**8. Multiple Specifiers**

**Sometimes, an uninterpretable feature keeps probing for new goals, even after Agree has already taken place with the closest goal. If the feature is also EPP, we find multiple movement, forming multiple specifiers.**

This is what we find in multiple questions in Slavic and other East European languages (including the non-Slavic languages Yiddish and Romanian, as well as Hungarian on some analyses).

What's interesting is how the *wh* phrases are ordered. The closest *wh* to C moves first. The next-closest "tucks in" under it. In class, I gave you examples from Russian. Here are very similar examples from Bulgarian, just for a bit of variety:

**Bulgarian**

(39)a. Koj kogo vižda?  
who whom sees  
'Who sees whom?'

b.\*Kogo koj vižda? [on multiple pair reading]  
whom who sees

(40)a.Koj kade \_\_\_ udari Ivan \_\_\_ ?  
who where hit Ivan [NB: *Ivan* is the subject. The verb is in C]  
'Who hit Ivan where?'

b.\*Kade koj \_\_\_ udari Ivan \_\_\_ ? [on multiple pair reading]  
where who hit Ivan

(41)a. Koj kəde udari Ivan  
who where hit Ivan  
cf. *Who hit Ivan where?*

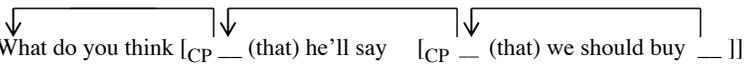
b. \*Kəde koj udari Ivan  
cf. \**Where did who hit Ivan?*

## 9. Successive-cyclic *wh*-movement & Subjacency

### Can *wh* move to the closest C — interrogative or not?

We have seen that interrogative C bears a Wh feature with an EPP property. This feature causes *wh*-movement to Spec,CP.

Could it be the case that non-interrogative C (the C that introduces a declarative clause: *that, ø, for*) also may bear a feature that attracts *wh*-phrases to it (a semantically neutral, i.e. *uninterpretable* version of the Wh-feature)? If so, *wh*-movement would "stop off" at intermediate specifiers of CP on its way to its final location.

(42) 

• **Answer: yes !** This is called the "**successive cyclic**" property of *wh*-movement.<sup>10</sup>

- **As so often in** this course, there is "stranding" evidence for successive cyclic *wh*-movement. The evidence comes from West Ulster English (N. Ireland), studied by James McCloskey (discoverer of the *fuck-all* data from the unaccusativity problem set).
- The evidence concerns phrases like *what-all* and *who-all*, which are possible in many dialects of colloquial English. *What-all* and *who-all* seem to mean the same as *what* and *who*, except that the answer is expected to be a plurality. Those of you who know Spanish are familiar with this from the *quién/quienes* 'who.SG/'who-PL' distinction.

### **But now to what makes West Ulster English special:**

- **In West Ulster English, unlike other dialects, expressions like *what all, who all* etc. can undergo *wh*-movement and strand *all* in the trace position.**<sup>11</sup> This is very much like the Japanese numeral quantifier stranding discussed earlier in the class.

- (43) a. **What-all** did you give \_\_\_ to the kids?  
b. **What-** did you give \_\_\_-**all** to the kids?
- (44) a. **Who-all** did you send \_\_\_ to the shops?  
b. **Who-** did you send \_\_\_-**all** to the shops?
- (45) a. Tell me **what-all** you got \_\_\_ for Christmas.  
b. Tell me **what-** you got \_\_\_-**all** for Christmas.

As with Japanese numeral quantifier stranding, it is important to make sure that the *all* is not simply free to occur anywhere. It really does seem to stand next to the trace of the *wh*-word. It cannot occur in random places:

- (46) \***Who-** did he tell \_\_\_ he was going to resign -**all**.
- (47) a. **What-** did you do \_\_\_-**all** after school the day?  
b. \***What-** did you do \_\_\_ after school the day -**all**?  
c. \***What-** did you do \_\_\_ after school -**all** the day.

### **And now to what makes West Ulster English not only special, but truly exciting:**

- *All* may also be stranded in any Spec,CP that lies between the original position of the *wh*-phrase and its final position.

### West Ulster English

- (48) **West Ulster -all stranding in specifier of a declarative CP (with complementizer *that*)**
- a. *What-all* did he say [CP \_\_\_ that [TP he wanted \_\_\_]]?  
b. *What-* did he say [CP \_\_\_ that [TP he wanted \_\_\_ -*all*]]?  
c. *What-* did he say [CP \_\_\_-*all* that [TP he wanted \_\_\_]]?

<sup>10</sup> Like many terms in syntax, this one is a holdover from an earlier model of syntax, that included a notion called the "cycle". I won't burden you with the explanation here, but I also didn't want you to be scratching your head over the term.

<sup>11</sup> *What all* etc. seem to mean the same as *what* etc. except that the answer is expected to be a plurality. *What all* is not literary English, but is common in many dialects of the US, as well as in Ireland. (I'm not sure about other dialects.) The phenomenon in the (b) sentences, however, is not (as far as I know) found in the US. If you know otherwise, tell me!

- (49) **W. Ulster -all stranding in specifier of declarative CP (with complementizer  $\emptyset$ )**  
 a. *What-all* did he say [CP \_\_\_  $\emptyset$  [TP he wanted \_\_\_]]?  
 b. *What-* did he say [CP \_\_\_  $\emptyset$  [TP he wanted \_\_\_ -all]]?  
 c. *What-* did he say [CP \_\_\_ -all  $\emptyset$  [TP he wanted \_\_\_]]?
- (50) **W. Ulster -all stranding in specifier of declarative infinitive with complementizer  $\emptyset$**   
*What-* were you trying [CP \_\_\_ -all  $\emptyset$  [TP PRO to say \_\_\_]]?
- (51) **W. Ulster -all stranding in specifier of declarative infinitive with complementizer *for***  
*Who-* did you arrange [CP \_\_\_ -all *for* [TP your mother to meet at the party]]?
- (52) **W. Ulster -all stranding in specifier of declarative CP with complementizer *that*: two levels of embedding!**  
 a. *What-all* do you think [CP that he'll say [CP that we should buy \_\_\_]]?  
 b. *What-* do you think [CP \_\_\_ -all that he'll say [CP that we should buy \_\_\_]]?  
 c. *What-* do you think [CP that he'll say [CP \_\_\_ -all that we should buy \_\_\_]]  
 d. *What-* do you think [CP that he'll say that we should buy \_\_\_ -all]?

(McCloskey, James (2002) "Quantifier Float and *Wh*-Movement in an Irish English". *Linguistic Inquiry* 31:57-84.)

### Binding evidence

Principle A also provides evidence for successive cyclic *wh*-movement through intermediate specifiers of CP.

- (53) **Binding evidence for successive cyclicity**  
 a. **Principle A applies in highest Spec,CP**  
 [1Tom asked [2 [which picture of himself] Mary thought [3 \_\_\_ that the kids liked \_\_\_]]]
- b. **Principle A applies in intermediate Spec,CP**  
 [1Tom asked [2 [which picture of herself] Mary thought [3 \_\_\_ that the kids liked \_\_\_]]]
- c. **Principle A applies in the lowest position**  
 [1Tom asked [2 [which picture of themselves ] Mary thought  
 [3 \_\_\_ that the kids liked \_\_\_]]]

We can check that Principle A is otherwise acting normally (nothing wild is going on) by noticing that the antecedent still must c-command the reflexive in the relevant position:

- (54) **Binding Principle A is observed in this construction:**  
 a. \* [1Tom's sister asked [2 [which picture of himself] Mary thought  
 [3 \_\_\_ that the kids liked \_\_\_]]]  
 b. \* [1Tom asked [2 [which picture of herself] Mary's brother thought  
 [3 \_\_\_ that the kids liked \_\_\_]]]  
 c. \* [1Tom asked [2 [which picture of themselves ] Mary thought  
 [3 \_\_\_ that the kids's teacher liked \_\_\_]]]

## 10. The necessity of successive-cyclic *wh*-movement: evidence from Dinka

(In class, we discussed this before West Ulster English and before the Binding Evidence given above, but as I realized, it logically comes after that discussion — so that's how I've arranged things here.)

Dinka is a Nilotic language spoken in Southern Sudan. The data below come from work of Coppe van Urk (including a paper co-authored with Norvn Richards).

- **Fact 1:** Dinka is a verb-second language.

- (55) **V2 property of Dinka: main clauses**
- a. C̄an ac̄am kw̄in.  
 Can eats food  
 'Can [a proper name] is eating food.'
- b. B̄ol aci w̄eŋ kw̄al̄ r̄òk.  
 Bol has cow stolen town  
 'Bol [another proper name] has stolen a cow in the town.'
- c. Kw̄in ac̄ém C̄an.  
 food eats Can  
 'Food, Can is eating.'
- d. W̄eŋ acií B̄ol kw̄al̄.  
 cow has Bol stolen  
 'A cow, Bol has stolen.'
- c. R̄ók acií B̄ol w̄eŋ kw̄al̄.  
 town has Bol cow stolen  
 'In the town, Bol has stolen a cow.'

some ungrammatical examples:

- f. \*Cám Cạn kwɪn.  
eats Can food  
'Can is eating food.'
- g. \*Cíi Bòl wéŋ kwàl ròòk.  
has Bol cow stolen town  
'Bol has stolen a cow in the town.'
- h. \*any other non-V2 order

- **Fact 2:** Unlike German, V2 in Dinka is also found in embedded clauses.

(56) **V2 property of Dinka: embedded clauses**

- a. Bòl aci luéel, [Cạn aci kitàp ɣòòc].  
Bol has said Can has book bought  
'Bol has said that Can bought a book.'
- b. Bòl aci luéel, [kitàp aci Cạn ɣòòc].  
Bol has said book has Can bought  
'Bol has said that Can bought a book.'
- c. \*Bòl aci luéel, [aci Cạn kitàp ɣòòc].  
Bol has said has Can book bought  
'Bol has said that Can bought a book.'
- d. \*any other non-V2 order

- **Analysis:** Let us assume the same analysis we have given to V2 in German: movement from T to C of the finite verb, and movement of some other phrase to form the specifier of CP.

(There is more to figure out about this than the data presented below lets on, but let's stick with a simplified story for present purposes.)

- **Fact 3:** Wh-questions involve movement of a *wh*-phrase to the specifier of CP, much as in English — and also T-to-C movement, resulting in a V2 configuration for questions as well as declaratives (again just as in German).

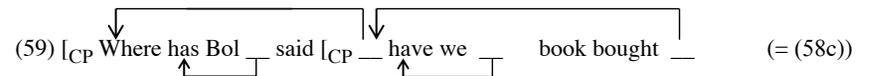
(57) **V2 property of Dinka questions: main clauses**

- a. Yeŋú càm Cạn?  
what eats Can  
'What is Can eating?'
- b. Yeŋú cíi Cạn càm?  
what has Can eaten  
'What has Can eaten?'

- **Now the key facts!** When *wh*-movement takes place from a subordinate clause (as in English 'Who did you say bought a book, **the verb must come first in that subordinate clause**:'

(58) **V1 property of Dinka embedded clauses from which *wh*-movement has taken place**

- a. Yeŋà cíi Bòl luéel, [cíi kitàp ɣòòc]?  
who has Bol said has book bought  
'Who did Bol say [\_\_ bought a book]?'
  - b. \*Yeŋà cíi Bòl luéel, [kitàp aci ɣòòc]?  
who has Bol said book has bought  
'Who did Bol say [\_\_ bought a book]?'
    - c. Yétenò cíi Bòl luéel, [cíi ɣòòk kitàp ɣòòc \_\_]?  
Where has Bol say have we book bought  
'Where did Bol say [that we bought a book \_\_]?' (asking about the location of book buying)
    - d. \*Yétenò cíi Bòl luéel, [kitàp aci ɣòòk ɣòòc]?  
Where has Bol say book have we bought  
'Where did Bol say [that we bought a book \_\_]?'
      - This fact can be explained straightforwardly if ***wh*-movement can only exit a CP via its specifier position — i.e. if *wh*-movement is obligatorily successive-cyclic, stopping off at Spec,CP.** The embedded clause sounds like a V1 clause because its specifier was filled by a moving *wh*-phrase that later moves on:



- This in turn means that a semantically inert +*wh* feature must be available for declarative C that has the same attracting EPP-ish power as its semantically interpretable counterpart in interrogative C. Various questions arose about this in class, which I need to leave for some other semester...

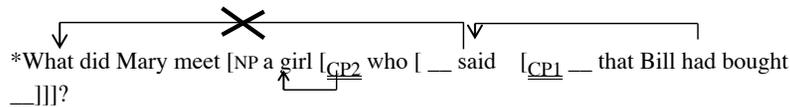
## 11. The necessity of "successive-cyclic" *wh*-movement: *wh*-islands and relative-clause islands

Even without a general V2 property that makes it blindingly obvious that long-distance *wh*-movement must stop off at the specifier of CP, languages like English provide evidence for the **successive-cyclic** nature of *wh*-movement — from certain **island effects** that arise when *wh*-movement tries to take place out of a clause where the specifier of CP is already occupied.

### Wh-islands

This phenomenon is found when one tries to extract a *wh*-phrase from a declarative clause contained in an embedded question. The effect is called the ***wh*-island constraint**:

- (60) **The "Wh-island constraint"**  
 (\*crossing a *that*-clause and then an interrogative)<sup>12</sup>



In example (60), even though *what* may move to Spec,CP1, it may not move to Spec,CP2 — since that specifier is occupied by *who*.<sup>13</sup> Consequently, the second step of *wh*-movement must cross two CPs. It has been suggested that this is not allowed.

### Complex NPs

In fact, not only can *wh*-movement not cross more than one CP at a time — it apparently cannot cross a DP and a CP in the same step. This phenomenon is called the **Complex NP Constraint** (where "complex NP" means an NP — a.k.a. DP — containing a CP). There are two situations to consider: CP complements to N and relative clause modifiers of N' (and D):

Constraints on extraction out of particular domains are called **island conditions**. Domains out of which extraction is forbidden are called **islands**.

<sup>12</sup> Actually, simpler examples in which a *wh*-phrase just moves out of an interrogative clause (without any further embedding) are also bad, though not as bad as (60):

*What did Mary ask [who bought ]?*

— and in fact it's simpler examples like these that are most commonly cited as instances of the *Wh*-island

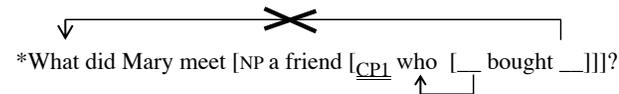
- (61) **The "Complex NP Constraint"**

a. **CP complement to N is an island**

\*Who did Mary resent [DP our claim [CP that Bill had invited ]]]?

b. **A relative clause (CP modifier of N') is an island**

\*What did Mary want to meet [DP the man [CP who had said ]]]?



*If you had voted for another class on *wh*-movement, we would have covered the following topic. We didn't, but you might like to know anyway:*

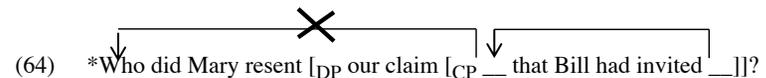
We can understand the complement case of the Complex NP Constraint as a prohibition against crossing not merely two CPs, but also a CP and a DP. This is called the **Subjacency Condition**. The nodes that the subjacency condition cares about are called **Bounding nodes** (also known as **barriers**):

- (62) **The Subjacency Condition**

Movement may cross at most one bounding node at a time.

- (63) **Bounding nodes: CP, DP.**

**Important:** To understand the Complex NP Constraint as a case of Subjacency, we must suppose that D, unlike C, *cannot bear an uninterpretable *wh* feature*. Thus, successive cyclic movement of *wh* is not allowed through Spec,DP. In this sense, DPs are just like CPs whose specifier is otherwise occupied.



## 12. Another island condition: the Condition on Extraction Domains (CED)

The statement in (65) also appears to be true:

constraint. As you can calculate for yourself, the Subjacency Condition as stated below does not rule these examples out — but can be tweaked to do so. I will leave this tweaking for a future syntax class, however.

<sup>13</sup> Notice that *who* must move first to Spec,CP2 by Attract Closest. One might wonder whether examples like (60) are also ruled out by Attract Closest, since after *who* has moved to Spec,CP2, it is closer to the highest C than *what* is. This is a reasonable question — one that might undermine the arguments for the necessity of an independent Subjacency Condition. But there is more to it than this, a topic I won't develop here.

(65) **Condition on Extraction Domains**  
Wh-movement is forbidden from non-complements.

For example, extraction from subjects is forbidden:

- (66) \*Who are [pictures of \_\_\_] on sale at the Coop?
- (67) \*Who would [for Mary to talk to \_\_\_] annoy Peter?

And extraction from adjuncts:

- (68) a. ??Who will Bill be unhappy [unless I invite \_\_\_]?
- b. \*To whom did Sue leave the room [because she had spoken \_\_\_]?
- c. \*What will Mary get mad [since I didn't finish \_\_\_]?

**Note:** Extraction out of a relative clause is forbidden both by Subjacency and by the CED. Is this overkill? Or does it perhaps explain why the island effects are particularly strong with relative clauses? You decide!

**Note:** Head movement also obeys CED!

**13.The Coordinate Structure Constraint (CSC)**

Finally, another island constraint:

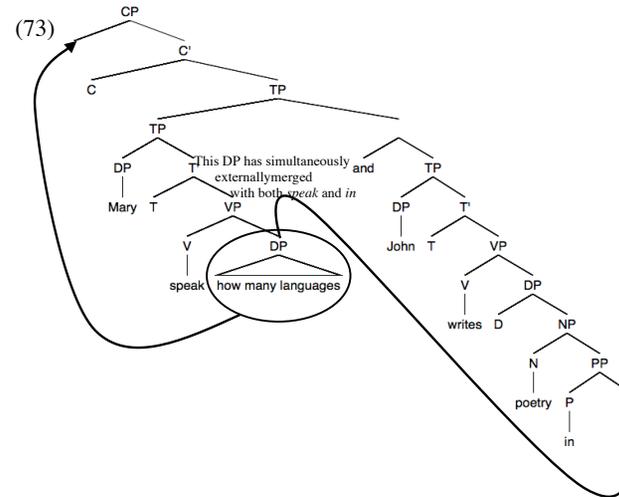
(69) **Coordinate Structure Constraint You submitted an order in the amount of \$29.47 USD to Jarden Consumer Solutions**  
1. A conjunct in a coordinate structure may not be moved out of that coordinate structure [strong effect]; and  
2. Extraction out of a conjunct is also forbidden [weak effect]

- (70) **CSC clause 1**
    - a. \*Which book did you read *Harry Potter* and \_\_\_?
    - b. \*Which book did you read \_\_\_ and *Harry Potter*?
  - (71) **CSC clause 2**
    - a. [\*] How many languages does [Mary speak \_\_\_ fluently] and [has a translator's certificate from the UN]?
    - b. [\*]What kind of chocolates did John open [a jar of jelly-beans] and [a box of \_\_\_]
- but:**
- c. What kind of chocolates did John [go to the store] and [buy \_\_\_]

Interestingly, it appears possible to simultaneously extract a single *wh*-phrase from two or more conjuncts at once -- a possibility we will not explore further here. This is called "Across the Board" (ATB) movement, and appears to by-pass the CSC:

- (72)a. How many languages does [Mary speak \_\_\_ fluently] and [John write poetry in \_\_\_]
- b. What kind of chocolates did John eat a [bag of \_\_\_] and [a box of \_\_\_]?

ATB movement can be analyzed as a situation in which the element shared by the two conjuncts simultaneously externally merged in both of them — and then moved to the specifier of a shared CP:



**14.Covert Movement**

We have developed the following proposal throughout the class:

- **Movement is "Internal Merge", i.e.**
  - (i) make a copy of a constituent inside the current tree; and
  - (ii) merge the copy, forming a specifier (or adjoined position)

In this section, it will convenient to assume the following terminology:

- **The copies formed by movement are coindexed and form an object called a *chain*.**
- **Lower copies in a chain are called *traces*.**

(74) [C *uWh*] Mary bought which book -->  
[*which book*<sub>*i*</sub> [C *uWh*] Mary bought which book<sub>*i*</sub>]

Chain: (*which book*, which book)

How does the phonological component of the grammar talk to the syntax? So far, it looks like (75) is the operative principle:

(75) **Pronunciation Principle:**  
Pronounce the top member of the chain.

In this summary, however, we see some evidence that suggests that (75) is not always correct, at least not on the surface of things...

At first sight, it looks as though Japanese has the interesting property of lacking *wh*-movement entirely:

- (76) **Japanese: matrix questions**
- a. John-ga<sup>14</sup> Mary-ni nani-o ageta no?  
John-NOM Mary-DAT what-ACC gave Q<sup>15</sup>  
'What did John give to Mary?'
- b. John-ga naze kubi-ni natta no?  
John-NOM why was fired Q  
'Why was John fired?'

Japanese, in essence, has "John gave what to Mary" and "John was fired why" where English has comparable examples with *wh*-movement. Of course, so does English, in particular contexts (e.g. "remind me" questions, echo questions, etc.). But Japanese really goes whole hog and leaves *wh* phrases in situ even in embedded questions, where this is impossible in English [I'm slightly reordering the presentation in the handout]:

(77) **Embedded questions also show *wh*-in-situ**

Mary-ga [<sub>CP</sub>John-ga nani-o katta-ka] sitte-iru  
Mary-NOM John-NOM what-ACC bought-Q know  
'I know what John bought' [lit. 'I know John bought what']

- One might wonder, however, if Japanese has *wh*-movement after all, but with the twist that it is the *trace* (the position before movement) that gets pronounced, rather than the head of the chain (the position after movement). This would seem like believing in ghosts — that is, an untestable hypothesis — were it not for the fact that we now have a tool besides *hearing* a displaced element for identifying movement: *islands*!

<sup>14</sup> To a Japanese speaker, this sentence, and others like it, sounds much more natural if the nominative marker *-ga* is replaced with the topic marker *-wa*. Our examples ignore this fact, in the interests of clarity.

- The question is: Is the relation between (I) the position in which we hear a Japanese *wh*-phrase and (II) the position to which it would move in a language like English sensitive to islands? Can an island boundary intervene between these two positions? If so, we have evidence that Japanese has *wh*-movement after all, and we just don't hear it.
- It turns out that if the *wh*-phrase is modified by *ittai* (lit. "one body"), which has something of the flavor of "on earth" or "the hell" in *what on earth* or *what the hell*, it can be embedded in a simple *that*-clause, but not in a relative clause or in an adjunct:

(78) **Baseline:**  
Mary-ga John-ni [ittai nani-o] ageta-no?  
Mary-NOM John -DAT on-earth what-ACC gave - Q  
'What on earth did Mary give to John?'

(79) **Simple embedding:**  
Mary-ga [<sub>CP</sub>John-ga [ittai nani-o] yonda to] itta-no?  
Mary-NOM John-NOM on-earth what-ACC read that said-Q  
'What on earth did Mary say that John read?'

(80) **Complex NP Constraint:**  
??Mary-ga [<sub>DP</sub> [<sub>CP</sub>John-ga [ittai nani-o] yonda] koto-o]  
Mary-NOM John-NOM on-earth what-ACC read fact-ACC  
  
wasureteiru-no?  
remembered- Q  
'What on earth did Mary remember [the fact [that John read \_\_\_]]'

(81) a. **Complex NP Constraint<sup>16</sup>**  
\*Mary-ga [<sub>DP</sub> [<sub>CP</sub>John-ni ittai nani-o ageta] hito-ni] atta-no?  
Mary-NOM John-DAT on-earth what-ACC gave man-DAT met - Q  
'What on earth did Mary meet [the man [who gave \_ to John]]?'

b. **CED effect**  
\*Mary-ga [John-ga [ittai nani-o] yomu mae-ni] dekaketa-no?  
Mary-NOM John-NOM on-earth what-ACC read before left - Q  
'What on earth did Mary leave [before John read \_\_\_]?'

- If *ittai* is omitted, the sentences are not so bad for most speakers, which is a mystery that I will leave unsolved for now.

<sup>15</sup> "Q" is a gloss for the interrogative complementizer.

<sup>16</sup> As you can see, relative clauses precede their N' in Jaonese.

- Actually, there is an exception to the mystery:

Adjuncts like *naze* 'why' obey islands even without *itai*:

(82) a. **Complex NP Constraint (Subjacency) with *naze* 'why'**  
 \*Mary-ga [DP [CP John-ni *naze* hon-o ageta] hito-ni] atta-no?  
 Mary-NOM John-DAT why book-ACC gave man-DAT met - Q  
 'What is the reason *x* such that Mary met [a man who gave John a book for reason *x*].'

b. **Adjunct island effect (CED) with *naze* 'why'**  
 \*Mary-ga [John-ga *naze* hon-o yomu mae-ni] dekaketa-no?  
 Mary-NOM John-NOM why book-ACC read before left - Q  
 'What is the reason *x* such that Mary left [before John read a book for reason *x*].'

- This parallels English, where island effects are often squishy with extraction of DPs but quite robust with extraction of adjuncts.

(83) a. ??What did Mary resent [the fact that they had fixed\_\_ with a wrench]?  
 b. \*How did Mary resent [the fact that they had fixed the car \_\_]?  
 c. \*Why did Mary resent [the fact that they had fixed the car \_\_]?  
 (on the readings indicated by the bracketing)

**The point:**

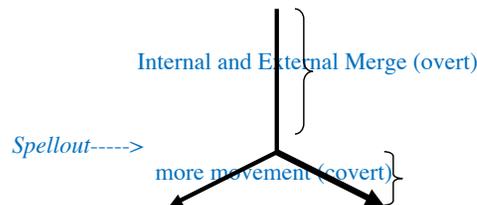
Japanese *wh*-phrases (ignoring the mystery mentioned above) act just as if they had moved to Spec,CP — obeying island conditions! The only difference is that the movement is **covert**. It doesn't change the phonology. We don't *hear* the effects of movement.

**15. Tentative conclusion: the model**

In Japanese, when a verb selects a +*wh* complementizer, the requirement of *wh*-movement to specifier of CP is met by "covert movement" in the embedded clause.

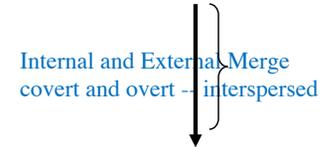
**How this fits in the model:**

(84) **Possibility #1 (the "Y" model)**  
 Wh-movement may happen before or after **Spellout** -- the point at which the syntactic derivation makes contact with phonology. Movement after Spellout is covert, since it does not feed the phonology. The Pronunciation Principle in (75) is correct.



**PF** (Phonetic Form)      **LF** (Logical Form)

(85) **Possibility #2 (the "single output" model)**  
 Wh-movement always happens the same way. The Pronunciation Principle is wrong. The EPP property of certain heads dictates that you pronounce the new top of the chain formed by movement. The EPP property of other heads dictates that you pronounce the old top of the chain formed by movement.



**PF & LF**

Which is right? Take another syntax class for more discussion!