

1 What's functioning as the variable in a wh-question?

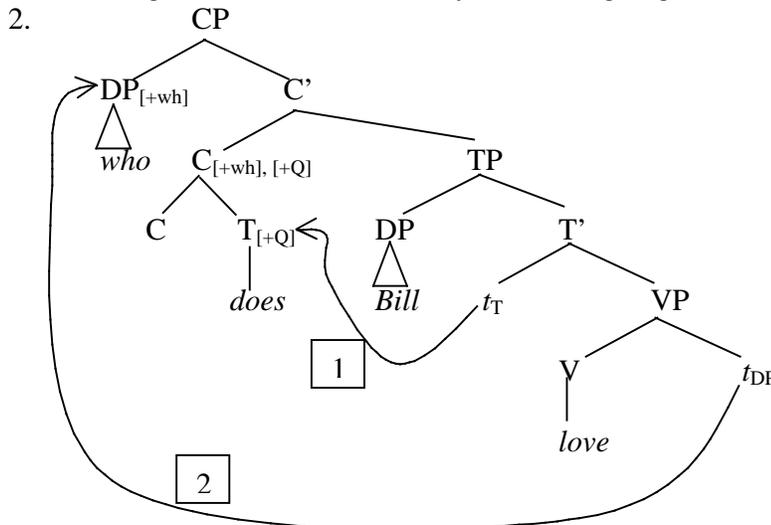
Recall that: A roughly model-theoretic way of thinking about the meaning of a wh-question like *Which books did Bill read?* is something like, "Of the set of things which are books, Bill read some of the members of that set. Tell me which ones." This is similar to the model-theoretic interpretation of "Bill read every book", which is "Of the set of things which are books, Bill read every member of that set". Similarly for the existential quantifier "some", "Bill read some books" has the interpretation "Of the set of things which are books, Bill read some of the members of that set."

- 1. a.  $x:\text{book}(x), \text{read}(B, x)$
- b.  $x:\text{book}(x), \text{read}(B, x)$
- c.  $\text{Wh}x:\text{book}(x), \text{read}(B, x)$

Wh-pronouns like "what", "who" work the same way, except that instead of the restrictor being "book", it'll be "person" or "thing" (for some x such that x is a person, Bill likes X; tell me which ones).

Since logicians term the universal and existential quantifiers "operators", which are said to *bind* the variable (in this case x) over which they quantify — i.e. determine its reference—, the *wh*-word is also termed an operator. In fact, a popular semantic treatment of wh-words is to treat them as a combination of the existential quantifier and an imperative: "Bill read some books, tell me the names of those books = Which books did Bill read?" (This is an interesting treatment, since in many languages, *wh*-words are homophonous with existentials like *someone, something, sometime.*)

So, given the movement analysis, what's going on in a sentence like 1a?



→ This gives you a representation *very close* to the predicate-logical representations above, if you think of the **wh-word as an operator** and the **traces as the variables**

- 3.  $\text{Wh}_i [ \text{does Bill love } t_i ]$  (compare to 1c)

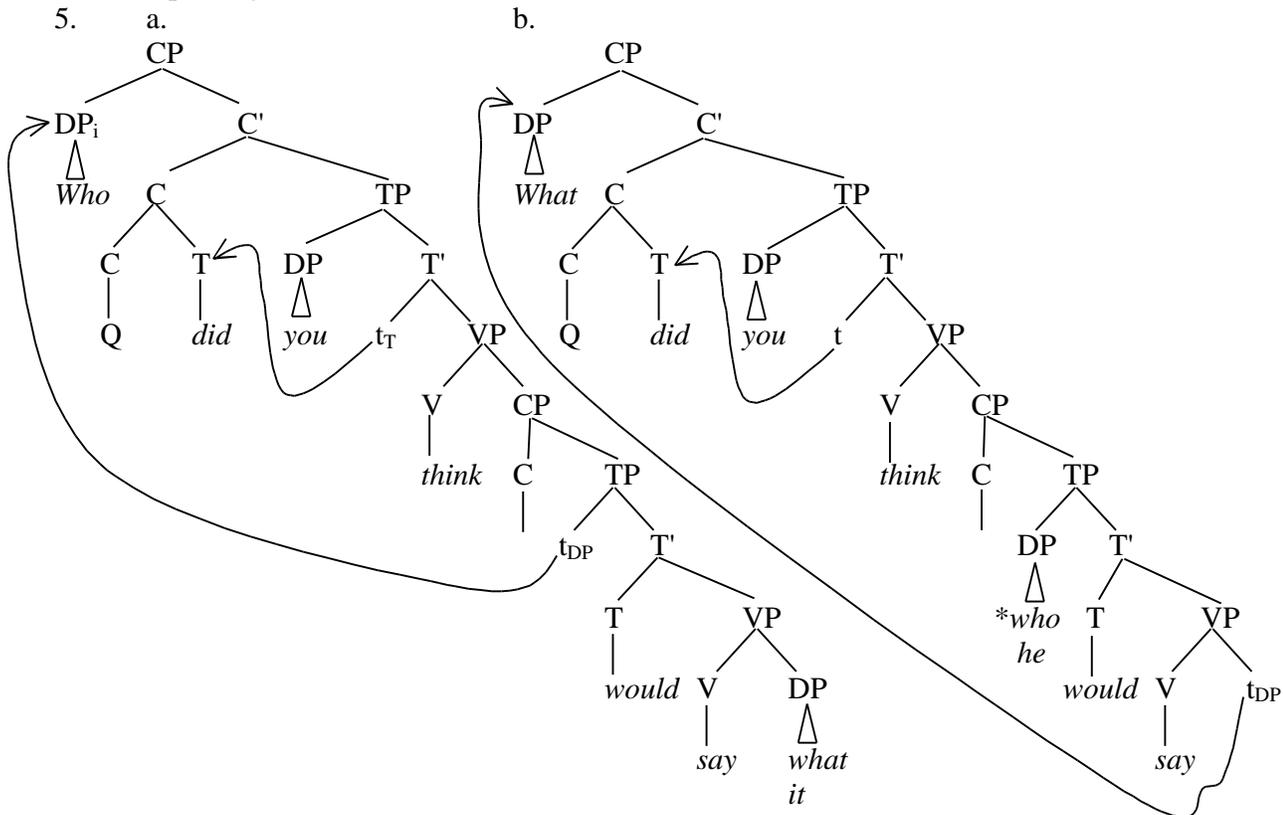
## 2. A Minimalist Approach to Islands: Shortest Move

→ Recall that in all our instances of head-movement, it looked like the *closest* appropriate head had to move to the attracting head; we called this the "Head Movement Constraint", and used it to account for *\*John walked not*. It also predicts that something like *\*Been John has t walking?* or *\*Was John had t walking?* is ungrammatical (similarly for head movement in German and French). (This is also true of phrasal movement, which I'll fold into the overall Minimalist picture next Tuesday).

Interestingly, we can see that there seems to be a similar constraint on wh-movement:

4. a. Who<sub>i</sub> did you think t<sub>i</sub> would say it?
- b. What<sub>i</sub> did you think John would say t<sub>i</sub>?
- c. Who<sub>i</sub> did you think t<sub>i</sub> would say what?
- d. \*What<sub>i</sub> did you think who would say t<sub>i</sub>?
- e. \*Who<sub>i</sub> what<sub>j</sub> did you think t<sub>i</sub> would say t<sub>j</sub>?
- f. \*What<sub>i</sub> who<sub>j</sub> did you think would t<sub>j</sub> say t<sub>i</sub>?

Notice especially the contrast between (c) and (d), illustrated below:



They are essentially the same except that instead of moving the highest *wh*-phrase, as in (c), in the ungrammatical (d), we've tried to move the lower *wh*-phrase. Notice, of course, that (d) is grammatical when the subject is not a *wh*-pronoun but a regular pronoun. (In neither order can we move both: (e) and (f).) Seems like we can say that movement is constrained in the same way in both head-movement and *wh*-cases: the "Shortest Movement Principle" says that if there are two movement possibilities to check a feature, the shortest one is the only one that works: shorter movements are more economical. (This is also called the "Minimal Link Condition" (MLC), or the "minimality condition", after the original version, discovered by Rizzi, "Relativized Minimality".

What about other island effects? Extraction out of relative clauses can be accounted for the same way:

6. a. This is the book which<sub>x</sub> Bill gave e<sub>x</sub> to Sue.
- b. \*Who<sub>i</sub> is this the book which<sub>x</sub> Bill gave e<sub>x</sub> to t<sub>i</sub> ?
- c. This is the person who<sub>x</sub> Bill gave a book to e<sub>x</sub>.
- d. \*What<sub>i</sub> is this the person who<sub>x</sub> Bill gave t<sub>i</sub> to e<sub>x</sub>?

### 3. Condition on Extraction Domains: some other islands.

A minimalist approach to subject and adjunct islands, however, can't appeal to Shortest Move:

7. Pied-piping + island:

- a. [Whose mother]<sub>i</sub> did he take [<sub>DP</sub> pictures of t<sub>i</sub> ]?
- b. \*[Whose mother]<sub>i</sub> did you think [pictures of t<sub>i</sub> ] were on the mantel?
- c. \*[Whose]<sub>i</sub> did you think [pictures of t mother] were on the mantel?
- d. \*[Of whose mother]<sub>i</sub> did you think pictures were on the mantel?
- e. [Pictures of whose mother]<sub>i</sub> did you think t<sub>i</sub> were on the mantel?

Here, although extraction from an object DP is ok (11a), extraction from the same DP in subject position is very bad. This is a "subject island"; sadly, there's no obvious way to reduce this to the MLC (although people try; possible paper topic!). In subject position, the only way to ask who the picture is of is to move the whole subject DP, as in (11e).

(Note: extraction from adjunct DPs is also bad:

- f. \*Who did John hit Mary with pictures of t?
- g. \*Pictures of who did John hit Mary with t?
- h. With pictures of who did John hit Mary?

Basically, if you're going to extract out of a DP, it better be the complement of a V; adjuncts and subjects don't let you do it. Huang called this the *Condition on Extraction Domains*.)

#### 4 Wh-movement to subject position in English?

#### 8. Wh-movement from subject position?

Hard to tell because with ordinary auxiliaries there would be no difference in the surface order.

- a. [CP Who [C' is [ TP  $t_{wh}$  [T'  $t_{is}$  [VP dancing ]]]] movement
- b. [CP [C' [TP Who [T' is [VP dancing ]]]] no movement

#### 9. FOR wh-movement from subject positions:

allows us to unify wh-features, the same feature is associated with wh-words in subject position as with object position.

In many languages there IS wh-movement of subject.

- a. Cé a bhfaca é Irish  
who wh-comp saw him  
“Who saw him”

(cf. Chonaic sé é  
saw him it  
“He saw it”(don't worry about the suppletive form of the verb)

We also get wh-movement out of subjects of embedded clauses in English:

- b. Who did Roger say [  $t_{wh}$  loved Bill?]

AGAINST wh-movement from subject position:  
no do-support in subject forms:

- c. \*Who does dance? (non-emphatic meaning)

(Although note: movement of the subject to specCP removes the phonological barrier between V and C: perhaps that's why do-support is unnecessary. )

#### 5. Review: wh-in situ: what's going on?

In English, to form a direct question, you have to move a wh-phrase (1a). If you want to ask about two things, you have to move one wh-phrase (1b), but you can't move both (1c), or neither (1d):

- 10. a. Who does Bill love  $t$ ?
- b. Who does Bill think  $t$  likes who?
- c. Who who does Bill think  $t$  likes  $t$ ?
- d. Does Bill think who likes who?<sup>1</sup>/Bill thinks who likes who?<sup>2</sup>

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<sup>1</sup> Good as a quote or an echo question.

In a certain subset of languages, though, you don't have to move the wh-word:

11. Chinese:  
Zhangsan yiwei [Lisi mai-le shinwe]?  
Zhangsan thinks [Lisi bought what] → well-formed direct question

English:  
What does Zhangsan think [Lisi bought t] ?

Consider the difference between the English verb *think* and the English verb *wonder*: *think* subcategorizes for a declarative clause (3a,b), while *wonder* subcategorizes for an interrogative clause (3c,d). Further, you can ask a question about an argument of the embedded clause with *think* (3e), but not with *wonder* (3f):

12. a. John thinks [Lisa bought a spoon]  
b. \*John thinks [what Lisa bought t]  
c. \*John wonders [Lisa bought a spoon]  
d. John wonders [what Lisa bought t]  
e. Who does John think [t bought a spoon]?  
f. \*Who does John wonder [t bought a spoon]?

3a-f are very easy to express if we assume that *wonder* selects for a CP complement with a [+Q] feature, and *think* selects for a CP complement with a [-Q] feature.

13. Huang noticed, however, that the same facts hold in Chinese. That is, the wh-in-situ phrase gives you an embedded question when the matrix verb is *wonder* and a matrix question when the matrix verb is *think*:

- a. Zhangsan xiang-zhidao [Lisi mai-le shenme]  
Zhangsan wonders Lisi bought what  
(i) "Zhangsan wonders what Lisi bought?"  
(ii) "\*What does Zhangsan wonder Lisi bought?"
- b. Zhangsan yiwei [Lisi mai-le shinwe]?  
Zhangsan thinks [Lisi bought what]  
(i) "What does Zhangsan think Lisi bought?"  
(ii) "\*Zhangsan thinks what Lisi bought?"

These facts receive an immediate explanation if Chinese does covert wh-movement, exactly like English wh-movement except that you cannot see it. In the sentence in (a), *xiang-zhidao* selects for a [+Q] complement clause, and it gets a [+Q] complement clause, where the wh-phrase *shenme* raises to give you an LF structure that's just like the English one.

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<sup>2</sup> Good as a quote or an echo question.

In the sentence in (b), *yiwēi* 'think' selects for a [-Q] complement clause. The questioned object of *mai-le* 'buy' cannot then raise at LF just to the embedded CP, giving the unavailable embedded question reading; rather, it raises all the way to the matrix [+Q] CP, resulting in the direct question. We can account for the different interpretations of the embedded clause *Lisi mai-le shenme* in exactly the same way that we can account for them in English.

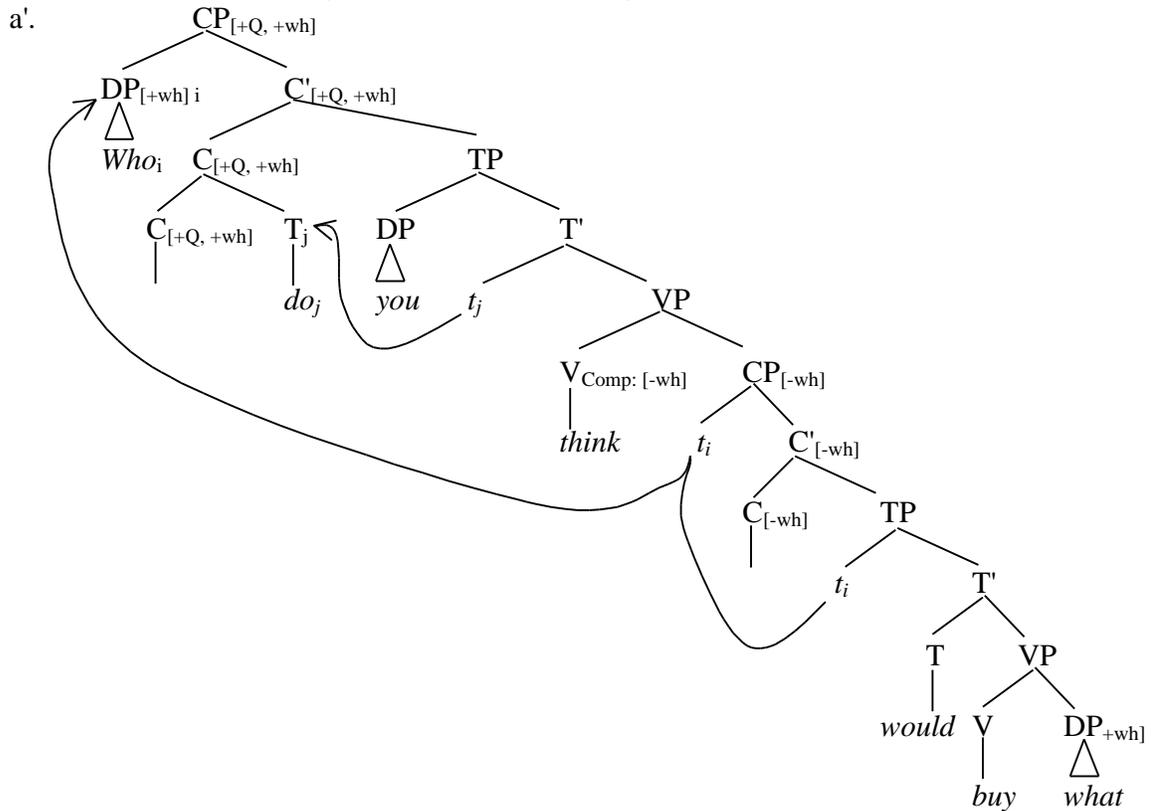
## 6 Islands in Wh-in-situ languages

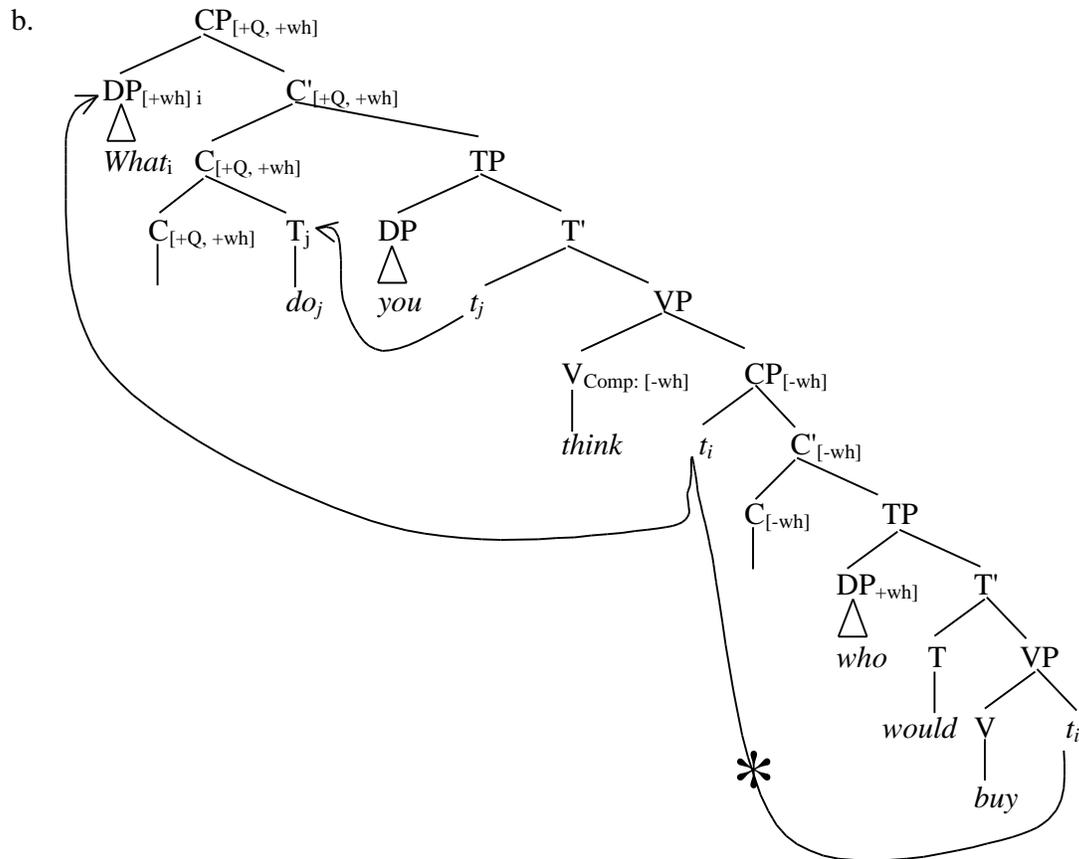
If there's actual covert movement of the wh-phrases in these languages, as Huang proposes, then if things like the Minimal Link Condition are part of Universal Grammar, we should perhaps expect to see that in-situ wh-phrases inside islands are ungrammatical in these languages. Here's a couple of things that are islands in English:

14. a. \*What do you remember [CP where we bought *t*]? *Wh-island*  
 (contrast with "You remember [CP where we bought the spoon]" —  
 same as the wh-islands with *wonder* we saw last time)  
 b. \*Who is he reading [DP a book that *t* wrote]? *NP-island*  
 (contrast with "He is reading [DP a book that John wrote]"

An aside: recall our treatment of wh-islands in terms of the Minimal Link Condition last time:

15. a. Who<sub>i</sub> do you think *t<sub>i</sub>* would buy what?  
 b. \*What<sub>i</sub> do you think who would buy *t<sub>i</sub>*?

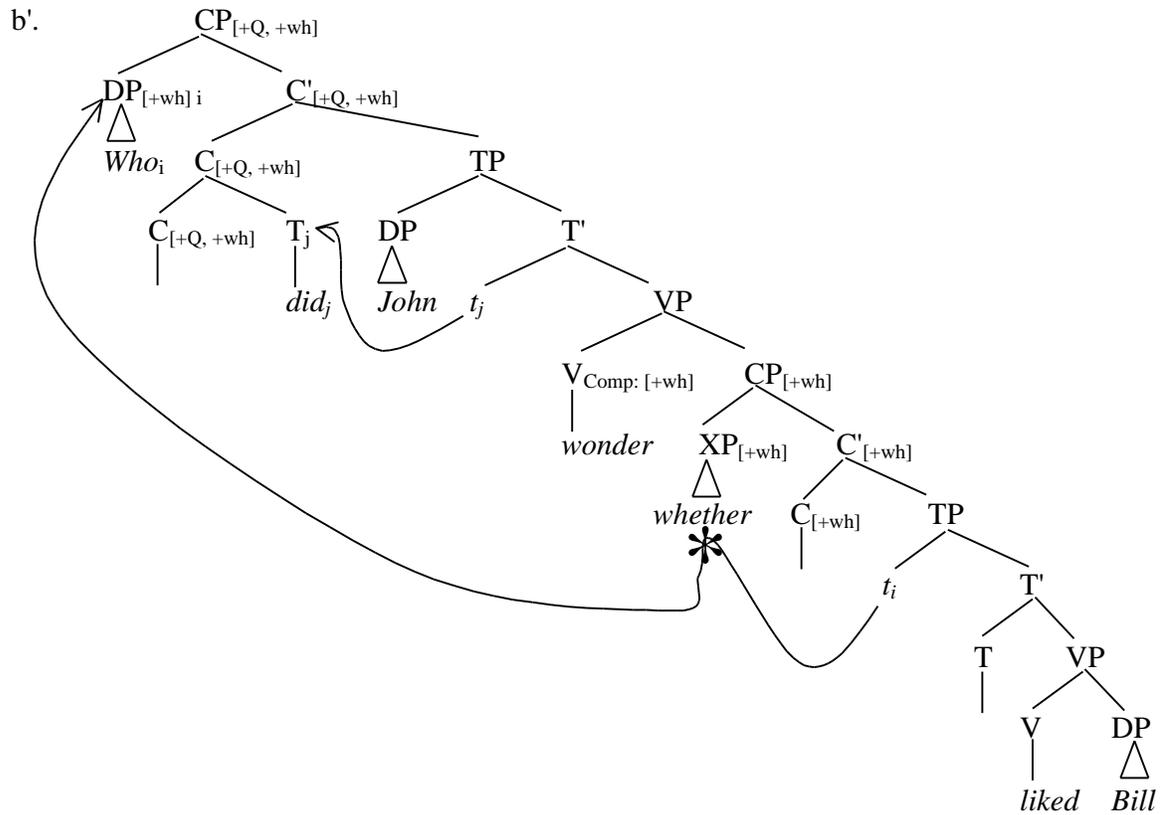




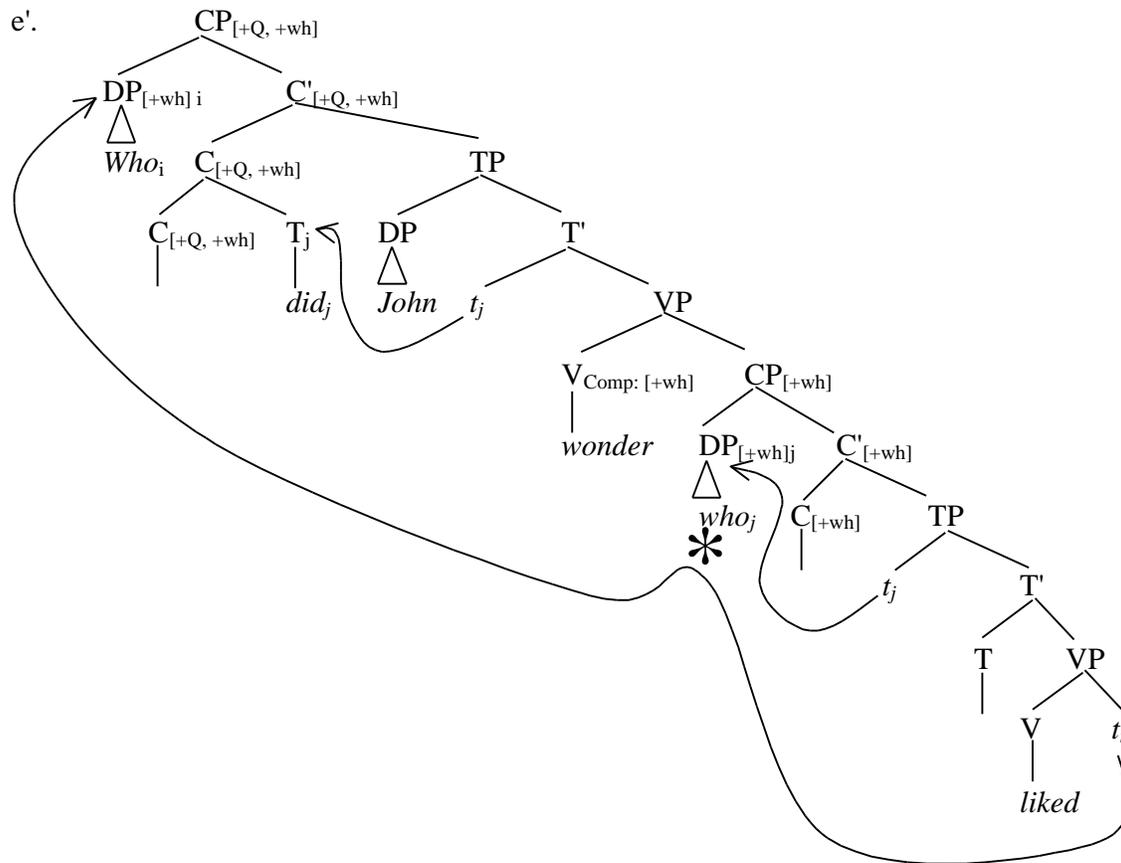
These are a type of *Wh*-island that is easy to account for in terms of the MLC. Slightly more difficult are the embedded question cases, exemplified in (13a) and also by our *wonder* cases from last time, exemplified in (16):

16. a. John wondered whether Mary liked Bill.  
 b. \*Who did John wonder whether *t* liked Bill?  
 c. \*Who did John wonder if *t* liked Bill?  
 d. John wondered who Mary liked *t*.  
 e. \*Who did John wonder who *t* liked *t*?  
 f. I remember [we bought the spoon at Bed, Bath and Beyond].  
 g. I remember [where we bought the spoon *t*]  
 (=7a). h. \*What do you remember [where we bought *t t*]?

Here's an illustration of the analysis we proposed last time for why (9b) is ungrammatical:



If *whether* occupies Spec-CP, and if wh-movement must be cyclic, stopping in every Spec-CP along the way, then the presence of *whether* in Spec-CP will block movement of *who*. (No appeal to the MLC is necessary here). Similarly for 9e, *Who did John wonder who liked*:



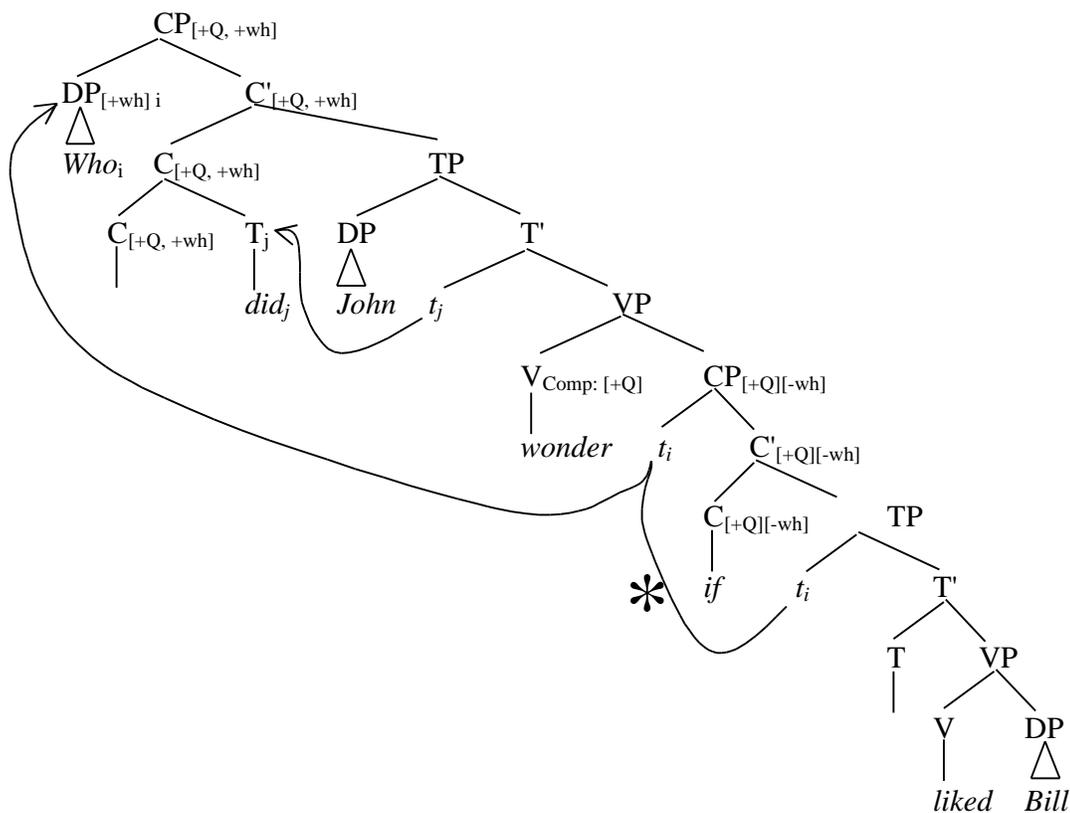
With this one, you might think that there were two reasons why it is bad: first, the embedded question has a *wh*-phrase in its specifier, blocking movement of another *wh*-phrase past it (as was the case for 9b, above), and second, we're violating the Minimal Link Condition by trying to move the object *wh*-phrase across the subject *wh*-phrase. In fact, that latter violation isn't necessarily occurring. Consider what's happening just at the level of the embedded question CP: the [+wh] feature of the CP is attracting the closest [+wh] item, subject *who*, and the [+wh] feature of subject *who* is consequently being checked. When the matrix [+wh] CP looks down the tree for the closest thing with a [+wh] feature, it's possible that it's looking for the closest *unchecked* [+wh] feature, which would put subject *who* out of the running; object *who* is the closest unchecked [+wh] item. The issue is: does the MLC look for the closest feature of the appropriate type, checked or unchecked, or does it look for the closest appropriate unchecked feature? If the former, then there are two things wrong with this sentence; if the latter, there's just one thing wrong, the filled Spec-CP.

(In the most recent Minimalism, there's no specifier/adjunct distinction, so the 'filled Spec-CP' problem isn't a problem; you can just adjoin on top of it. But don't worry about that for the moment!)

BUT! Notice that we don't have either an MLC or a Filled Spec-CP explanation for the badness of 9c, repeated below:

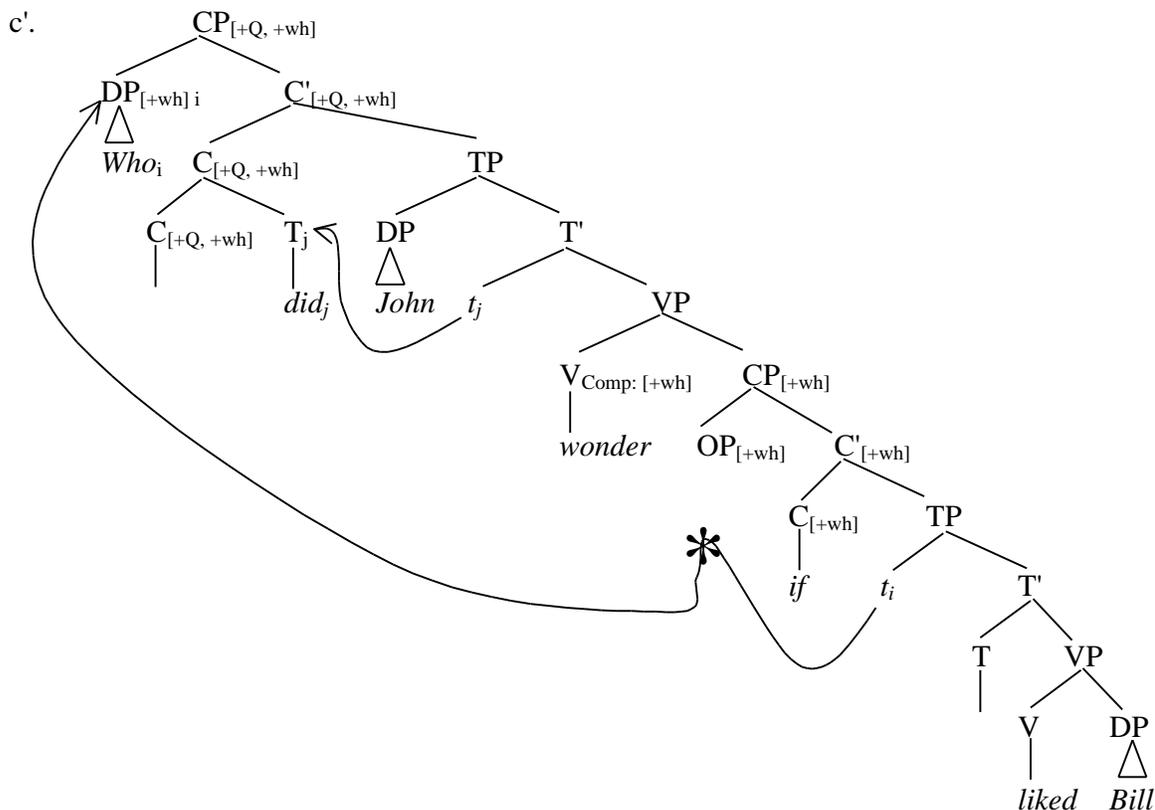
9. c. \*Who did John wonder if t liked Bill?  
 c'. John wondered if Mary liked Bill.

We know that *wonder* selects for embedded questions, so the clause [*if Mary liked Bill*] must count as a question. Prima facie, though, it's not a [+wh] clause; there's no overt [+wh] item in the specifier of CP. If there's no [+wh] item in the specifier of CP, then maybe it's just a clause marked [+Q], like a yes/no question. In that case, the tree looks like this:



Notice that neither the MLC nor the "Filled Spec" explanation work on this one: the wh-phrase is moving to satisfy the matrix [+wh] feature, and there's no closer phrase that could conceivably satisfy that feature; neither, apparently is SpecCP filled. We have two options. First, we could invent another constraint, according to which the presence of the intervening [+Q] feature on the embedded question blocks the movement of the [+wh] phrase; we could call it the "Question-Island Constraint", or something like that. (Not very nice, although of course it'll allow us to get rid of the Filled-Spec Constraint, because anything we've seen that the Filled-Spec Constraint took care of, the Question-Island Constraint will also take care of). Alternatively, we could assume that there is an *invisible* wh-word -- an invisible

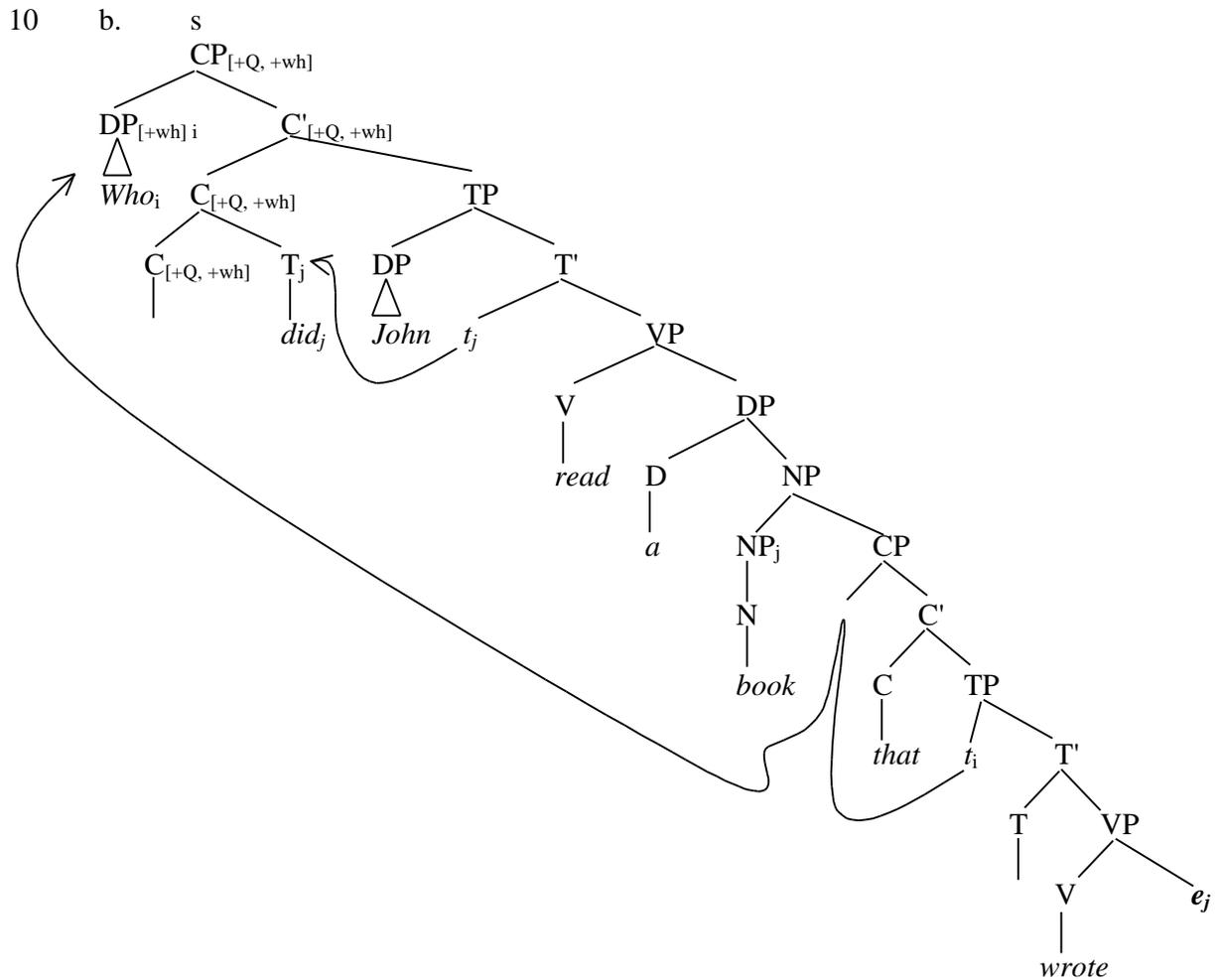
operator, like *whether* in all respects except that it's null -- in Spec-CP in these sentences; then our Filled-Spec constraint will take care of their ungrammaticality. In that case, the analysis will look like this:



Ok. So now we know what our options are, at least. Back to the examples in 7, presented again below as 10:

10. a. \*What do you remember [<sub>CP</sub> where we bought *t*]? *Wh-island*  
(contrast with "You remember [<sub>CP</sub> where we bought the spoon]" —  
same as the *wh*-islands with *wonder* we saw last time)
- b. \*Who is he reading [<sub>DP</sub> a book that *t* wrote]? *NP-island*  
(contrast with "He is reading [<sub>DP</sub> a book<sub>is</sub> [<sub>CP</sub> that John wrote *e*<sub>i</sub> ]]"

We understand, at least, we're pretty sure we understand 10a: it's like 9e above, trying to extract out of an embedded *wh*-question *where we bought what*. We *don't* understand 10b yet. Let's draw the tree for it and see what we get:



So at the moment we haven't got a hope of accounting for this one; there's definitely no [+Q] feature, no other [+wh] item around. If there's a null operator in Spec-CP in relative clauses, that might do it, but so far we don't have any evidence for such a thing. (At least with embedded *if*-yes/no questions, we have the *whether* variant to show us an overt version of the proposed null operator).

In the olden days, all these violations were subsumed under a single principle: used to be because of a principle called *Subjacency*; all the bad sentences in 7 and 9 are often collectively referred to as Subjacency violations. We'll separate them into Wh-Island violations and NP-Island violations.

But anyway, at least we've got a typology of bad wh-movements in English, which we can use to test whether or not there is covert movement in wh-in-situ languages.

Watanabe works on Japanese, so the first evidence he presents is from that language. The Japanese versions of 10a,b are below:

11. a. ??[nani-o doko-de katta ka] oboete-iru no?  
       what-ACC where-at bought Q remember Q  
       "What do you remember where we bought?"
- b. kare-wa [[dare-ga kaita] hon-o ] yonde-iru no?  
       he-TOP [[who-NOM wrote] book-ACC] read-PROG Q  
       "Who is he reading a book that wrote?"

Interestingly, while the Wh-Island violation is bad, the NP-Island violation is ok in Japanese. Many researchers have taken 11a as evidence in favor of LF wh-movement: wh-movement is subject to Subjacency, whether it's covert (as in Japanese) or overt (as in English). The Japanese and English derivations will be the same in 11a and 10a, both bad at LF for the same reasons (either Filled-Spec or Question-Island). Then the question is why NPs are islands in English but not in Japanese. (This might be nice, given that we have an explanation that seems to work for the wh-island case in English, but not for the NP-island case).

Can we find any case where an NP seems to be an island in Japanese? it turns out that we can: if we try to form a wh-question about a cause adjunct inside a relative clause, it's ungrammatical. First the English version:

12. a. He's reading a book that Sue wrote because she was unhappy.  
       b. \*Why<sub>i</sub> is he reading a book that Sue wrote t<sub>i</sub>?  
       c. Sue wrote a book because she was unhappy.  
       d. Why did Sue write a book?

The Japanese version of 12b is ungrammatical too:

13. ??Kare-wa [DP [CP John-ga naze kaita] hon-o] yonde-iru no?  
       he-TOP John-ga why wrote book-ACC read-PROG Q  
       "He is reading a book that Sue wrote why?"

So, there's some evidence that Japanese and English work the same way when it comes to wh-movement, even though wh-movement in Japanese is covert and in English it's overt. (The proposed solution to the grammaticality of 11b is that in Japanese certain NPs with relative clauses can pied-pipe — so 11b is grammatical in the same way that *Pictures of whose mother are on the mantelpiece?* is grammatical in English; the whole NP pied-pipes along with the wh-phrase. Adjunct wh-phrases like that in 13 can't trigger such pied-piping, however).

So far the case is looking good: wh-movement works mostly the same way in English and Japanese, but you just can't see it in Japanese. But....

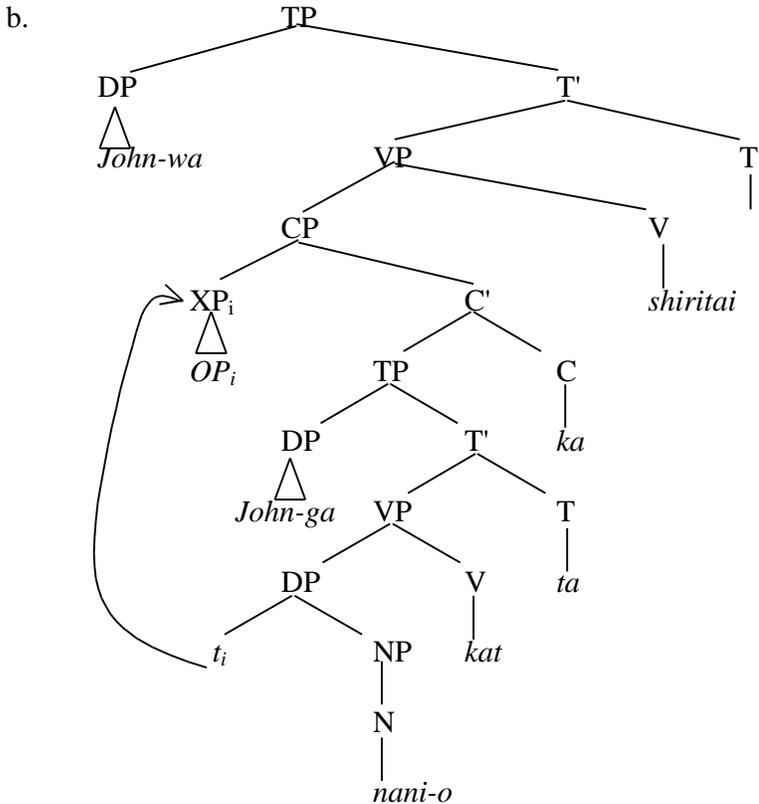
Watanabe in his thesis noticed that this seems to present a problem. You *can* do wh-in-situ in English, in (at least) multiple wh-questions. And when you do, there is no *wh*-violation involved:

14. a. Who bought what?  
 b. John asked who bought what?  
 c. Who did John think bought what?

Problem!! If wh-movement applies at LF to the second wh-phrase (which seems semantically likely, as they're both operators etc.), then we're back where we started; the Filled-SpecCP problem should arise at LF for English in these questions as well as in the converse question where we try to raise the object.

Two choices: either *a)* wh-in-situ in English multiple questions doesn't involve LF-movement or *b)* LF-movement in general is not subject to the Minimal Link or Filled-Spec conditions (perhaps because it's just movement of features, not of phonological items) AND...Japanese wh-movement is overt... it's movement of a null Operator, like we saw proposed for English embedded *if* questions earlier. In effect, the *dare* part only provides the indefinite variable that the operator binds; the actual operator is a null element that moves away, leaving *dare* behind. In English, the indefinite and the operator are all bundled up together in the *wh*-word; in Japanese they come in two pieces, one of which that can move to check the [+wh] feature separately. This is the account that Watanabe proposed in his thesis. On this account, the tree for 15a below looks like 15b:

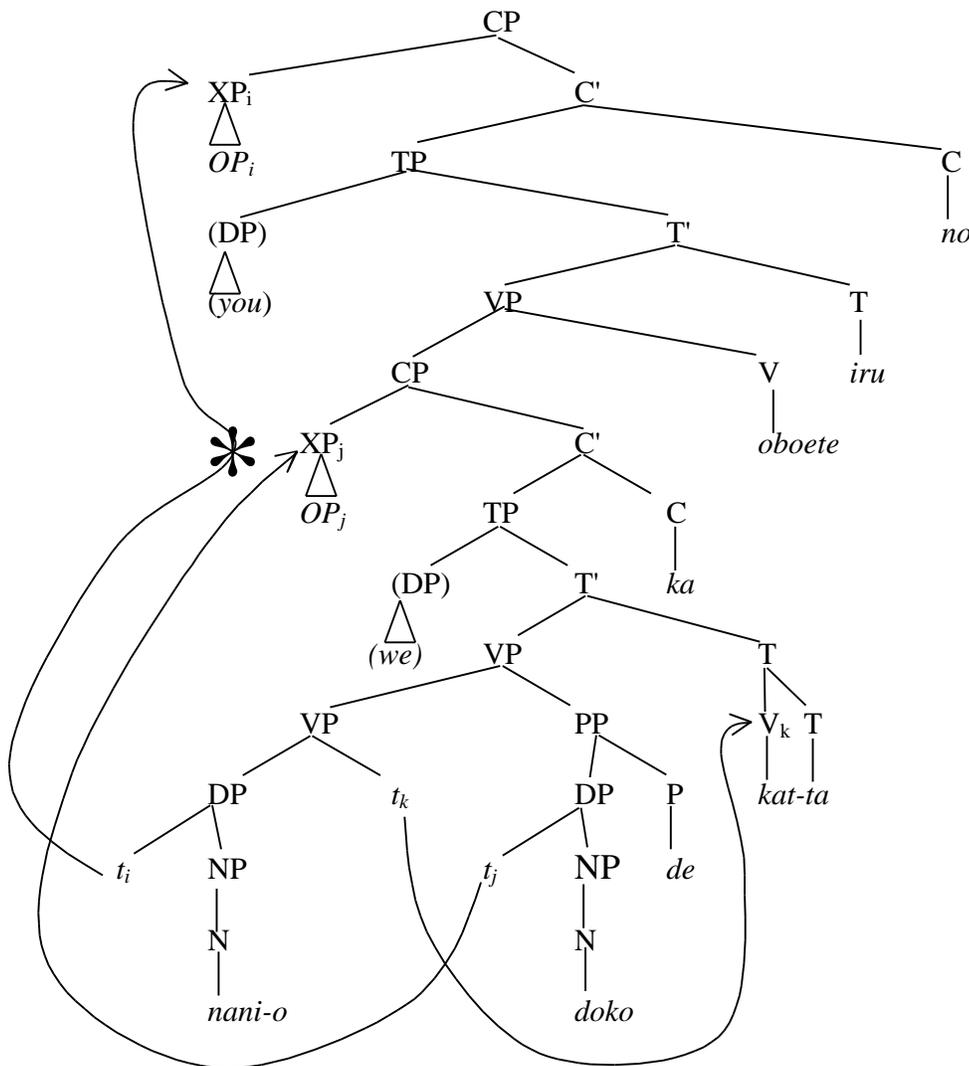
15. a. Boku-wa [John-ga nani-o katta ka] shiritai  
 I-TOP John-NOM what-ACC bought Q want-to-know  
 "I want to know what John bought"



And, the reason that 11a is bad is for the same reason that its English equivalent is bad: its Spec-CP is filled by overt movement of the embedded question's operator, and blocks the movement to the matrix clause of the other operator. This is illustrated as 16a and b below:

16. a. ??[nani-o doko-de katta ka] oboete-iru no?  
 what-ACC where-at bought Q remember Q  
 "What do you remember where we bought?"

b.



The other option, instead of assuming invisible operator movement, is to assume that the English multiple-Wh questions do not involve covert LF movement of any kind, but that the Japanese ones do. That will also get the right results -- so far. But there's another

tricky twist to throw into the equation: if you add another wh-phrase outside the clause in the Japanese Wh-Island violation, things get better. Contrast 17a and b:

17. a. ??John-wa [Mary-ga nani-o katta kadooka] Tom-ni tazuneta no  
 John-NOM [Mary-NOM what-ACC bought whether] Tom-DAT ask Q  
 "What did John ask Tom whether Mary bought?"
- b. John-wa [Mary-ga nani-o katta kadooka] dare-ni tazuneta no  
 John-NOM [Mary-NOM what-ACC bought whether] who-DAT ask Q  
 "Who did John ask whether Mary bought what?"

Again, just as in the English case, the sentence gets markedly better when a matrix wh-phrase is thrown into the mix. If in the English case we are proposing that the difference between *\*What did John ask Tom whether Mary bought?* and *Who did John ask whether Mary bought what?* is that in the latter, the *what* remains in-situ, not undergoing LF-movement and hence avoiding the violation. Not ice that here in Japanese, we need to be able to assume the same thing — some wh-phrases that are in situ *stay* in situ (in 17b) and are hence good, while others undergo covert movement (17a) and are hence bad. *OR*, we can adopt Watanabe's account: all *overt* movement is subject to Subjacency effects ("Filled Spec-CP" effects), but all covert movement is exempt — and Japanese has both, despite surface appearances.

(The whole theory runs into trouble with Serbo-Croatian and Bulgarian, where multiple overtly-moved Wh-phrases are possible; see Richards (1999? 2000?) for an account of those lgs.)

Let's skip the part about Comparative Deletion, and move on to Watanabe's discussion in section 3: "Morphology and the typological perspective".

What kinds of things are characteristic of languages that allow *wh*-in situ? Watanabe suggests that it might be homophony between wh-words and other quantificational expressions, illustrated for Chinese in 18:

18. a. ni xiang mai shenme ne?  
 you want buy what Q?  
 "What do you want to buy?"
- b. Wo shenme dou mai.  
 I everything all buy.  
 "I'll buy everything"
- c. Wo bu xiang mai shenme.  
 I not want buy anything.  
 "I don't want to buy anything".
- d. Ta dagai mai-le shenme-le.  
 He probably buy-PERF something-PART  
 "He probably bought something"

Almost the same thing is true of Japanese, but there's a crucial difference: to get the quantifiers in Japanese an additional particle must be added to the root wh-form, as illustrated in 19:

19. a. Dare-ga ringo-o tabeta no  
 Who-NOM apple-ACC ate Q  
 "Who ate an apple?"
- b. Daremo-ga ringo-o tabeta  
 Everyone apple ate.  
 "Everyone ate an apple"
- c. Daremo-ga ringo-o tabe-nak-atta  
 No one apple ate-NEG-PAST  
 "No one ate an apple."
- d. Dareka-ga ringo-o tabeta  
 Someone apple ate  
 Someone ate an apple.

Remember, however, that we've just seen it proposed that Japanese is *not* really a wh-in-situ language, but rather that there's overt movement in Japanese wh-questions. And, there are some crucial differences between Chinese and Japanese that Watanabe is going to propose are linked to the morphological differences seen in 19 above.

First, remember that we found Wh-Island effects in Japanese. In Chinese, however, the Wh-Island effect is absent! Compare 20a and b (20a is our old friend 11a repeated):

20. a. ??[nani-o doko-de katta ka] oboete-iru no?  
 what-ACC where-at bought Q remember Q  
 "What do you remember where we bought?"
- b. ni xiang-zhidao [wo wishenme mai shenme]  
 you wonder [I why buy what]?  
 "What do you wonder why I bought?"

Similarly, there's an interaction of wh-object with quantified subjects in Japanese (the object must be scrambled to the left of the subject) (21), but not in Chinese (22) (we'll continue to see similarities between quantifiers and wh-phrases as we go along):

21. a. \*?daremo-ga nani-o katta no?  
 Everyone-NOM what-ACC buy Q  
 "What did everyone buy?"
- b. nani-o daremo-ga katta no?  
 what-ACC everyone-NOM buy Q  
 "What did everyone buy?"
22. meigeren dou mai-le shenme?

everyone      all      buy-PERF      what?  
"What did everyone buy?"

All of this is what we would expect if Watanabe is right and Japanese has overt wh-movement of a null operator, but Chinese has no overt movement and questions are hence unaffected by things like the MLC or the Filled-Spec restriction (Subjacency).

What happens in Chinese? Essentially the proposal is that Chinese interprets its Wh-questions differently than English or Japanese. Rather than move an operator and leave behind a variable, Chinese just has the variable, and *base-generates* an operator binder – an "unselective" binder — up high in the clause. Essentially, Chinese has the equivalent of resumptive pronouns — *shenme* — in all its wh-constructions, and the real wh-word is simply not pronounced. Watanabe argues that the morphological difference between Japanese and Chinese is relevant here; the fact that Japanese quantifiers are built out of the *dare plus* a particle is a signal that it's possible for the wh-word to be built out of *dare* plus an invisible operator. In Chinese, there's no such morphological cue and the operator may not be added on to the *shenme* in any situation.

## 2 Wh-in-situ and scope marking

So far, we've seen four typological types of wh languages:

- I. English: overt movement of wh-phrases, movement of wh-phrases subject to island conditions. Wh-phrases in situ (in echo questions, pair-list questions, etc.) are not subject to island constraints.
  - a. Possible treatment: LF-movement of Wh-phrases or features is not subject to island constraints.
  - b. Another possible treatment: wh-words in situ simply do not need to move to get scope or check any features, either overtly or at LF, and are hence not subject to island constraints.
  
- II. Japanese: apparent wh-in-situ. Interpretation of wh-words as matrix questions subject to island conditions (except NP-islands with wh-arguments). Wh-words similar to quantifiers except for a morphological particle element.
  - a. Watanabe's treatment: overt movement of a null operator particle. LF movement of wh-phrases or features not subject to islands.
  - b. Another possible treatment: wh-words actually do move at LF to get matrix question interpretations, and LF-movement *is* subject to islands; some occurrences of wh-words in Japanese, like in English, are truly *in situ* and need never move.
  
- III. Chinese: true wh-in-situ. Interpretation of wh-words as matrix questions in Chinese is not subject to island constraints at all (except in one case, that is, interpretation of a wh-phrase in an adjunct island). Wh-words identical to quantifiers.

Tsai's treatment: an unselective binder (an operator) is base-generated high in the clause in Chinese questions, and can bind any variables (marked by the apparent wh-

words) in its scope, without any of them having to move. It doesn't work in adjunct islands because there is no variable available to bind in adjuncts.

IV. Irish: Wh-movement, like in English, with the key difference that it is apparently possible for a wh-phrase to ask a question about an XP buried in an island in Irish. However, when the wh-phrase is asking about an XP in an island, that XP cannot be just a trace, but rather must be a *resumptive pronoun*. (When asking about a phrase that 's not in an island, Irish behaves just like English, leaving an unpronounced trace behind in that position).

Possible analysis: when asking questions about phrases that are not within islands, Irish is like English, moving the wh-phrase. When asking questions about phrases that *are* within islands, Irish is like Chinese, base-generating an operator high up in the clause (the wh-phrase), and base-generating variables in the desired position within the island, which are unselectively bound.

Now, a fifth type of language: Scope-marking languages. Consider the following sentences from Hindi and Iraqi Arabic:

1. a. Raam-ne puuchaa [ki Mohan-ne kis-ko dekhaa]  
 Ram-ERG asked that Mohan-ERG who saw  
 "Ram asked who Mohan saw" (Hindi)
- b. Mona se?lat Ali [Ro?a ishtarat sheno]  
 Mona asked Ali Ro?a bought what (Iraqi Arabic)  
 "Mona asked Ali what Ro?a bought"

In these indirect questions, it looks like Hindi and IA are wh-in-situ languages like Japanese or Chinese: the wh-phrase is in the position of the argument. But now consider the sentences in 2:

2. a. kOn<sub>i</sub> Raam-ne socaa [ki t<sub>i</sub> aayaa hE].  
 who<sub>i</sub> Ram-ERG think that t<sub>i</sub> come has  
 "Who did Ram think had come?"
- b. \*Raam-ne socaa [ke kOn aayaa hE]  
 Ram-ERG think that who come has  
 "Who did Ram think had come?" (Hindi)
- c. Sheno<sub>i</sub> tsawwarit Mona [Ali ishtara t<sub>i</sub>]  
 What<sub>i</sub> thought Mona Ali bought t<sub>i</sub>  
 "What did Mona think Ali bought?"
- d. \*Mona tsawwarit [Ali ishtara sheno]  
 Mona thought Ali bought what  
 "What did Mona think Ali bought?" (Iraqi Arabic)

Here, these languages look like English: it's ungrammatical to leave the wh-phrases in the embedded clause, and grammatical to move them out. Essentially, it looks like the wh-phrases have to occur in the clause in which they have scope: in the embedded clause in indirect questions, and in the matrix clause in matrix questions.

There's another way to ask the questions in 2, however, without moving the wh-word. They're listed below:

3. a. Raam-ne kyaa socaa [ki kOn aayaa hE]  
 Raam-ERG SCOPE thought that who come has  
 "Who did Raam think had come?"
- b. Sh-tsawwrarit Mona [Ali ishtara sheno]  
 SCOPE-thoughtMona Ali bought what  
 "What did Mona think Ali had bought?"

These questions are interpreted as grammatical direct questions even though the wh-phrase remains in the embedded clause. The difference between them and (2b, d) above is the presence in the matrix clause of a scope-marking question particle.

Very interestingly, it appears that a separate scope marker must appear for each clause that intervenes between the *wh*-phrase and its desired scope in the matrix clause — another argument for cyclic LF movement. Compare the Hindi examples in (a), (b), (c) and (d) below:

4. a. \*Raam-ne socaa [ki Ravii-ne kahaa [ki kOn sa aadmii aayaa thaa]]  
 Ram-ERG thought thatRavi-ERG said that which man came  
 "Which man did Ram think that Ravi said came?"  
 (Ungrammatical for the same reason as 2b above)
- b. \*Raam-ne kyaa socaa [ki Ravii-ne kahaa [ki kOn sa aadmii aayaa thaa]]  
 Ram-ERG SCOPE thought thatRavi-ERG said that which man came  
 (Ungrammatical — scope marker *kyaa* only in the matrix clause)
- c. \*Raam-ne socaa [ki Ravii-ne kyaa kahaa [ki kOn sa aadmii aayaa thaa]]  
 Ram-ERG thought thatRavi-ERG SCOPE said that which man came  
 (Ungrammatical — scope marker *kyaa* only in the intermediate clause)
- d. Raam-ne kyaa socaa [ki Ravii-ne kyaa kahaa [ki kOn sa aadmii aayaa thaa]]  
 Ram-ERG SCOPE thoughtthatRavi-ERG SCOPE said that which man came  
 "Which man did Ram think that Ravi said came?"  
 Grammatical because there's a scope marker in each clause between the *wh*-phrase and its matrix scope.

Further, and most interestingly, even when you do overt movement of one *wh*-phrase, if you have a pair-list question like the English *Who thought Sita saw who?* then you have to have a matrix scope marker for the embedded object, even though the subject phrase has moved to the matrix clause:

5. Kis-ne \*(kyaa) socaa [ki siitaa-ne kis-ko dekhaa]?  
 Who-ERG \*(SCOPE) thought that Sita-ERG who-ABS saw  
 Who thought Sita saw who?

Notice, of course, that this contrasts with movement — in movement languages you only have to move one of the *wh*-phrases in order to satisfy the features of the matrix question. Here, however, it appears you need a marker for each *wh*-phrase; movement for one, scope-marker for another. (He doesn't say whether you can leave both downstairs on the strength of one scope-marker).

In German, you get a kind of a combination of the *wh*-movement and scope-marking strategies:

6. Was glaubt Hans [CP mit wem<sub>i</sub> [IP Jakob t<sub>i</sub> jezt spricht]]?  
 SCOPE believeHans with whom<sub>i</sub> Jakob t<sub>i</sub> now speak  
 "With whom does Hans think Jacob is now speaking?"

In 6, it is apparent that the *wh*-phrase (accompanied by its pied-piped PP) has moved from its base-position to Spec of the intermediate CP, and at the same time, the scope-marker *was* has appeared in Spec of the matrix CP. (*Was* and *kyaa* are the same as the words for *what* in German and Hindi respectively).

Since German has two strategies (English-like movement, which hasn't so far been illustrated, and intermediate movement+scope marker), an interesting question arises: in German pair-list questions, will the second (island-bound) *wh*-phrase move partway, remain in situ, and/or take a scope marker? Consider the sentences in 7:

7. a. Wer glaubt [<sub>CP</sub> dass ich meinte [<sub>CP</sub> dass Jakob mit wem gesprochen hat]]?  
 Who believes that I thought that Jacob with whom spoken has  
 "Who believes that I thought Jacob spoke with who?"
- b. \*Wer glaubt [<sub>CP</sub> dass ich meinte [<sub>CP</sub> mit wem<sub>i</sub> [<sub>IP</sub> Jakob  $t_i$  gesprochen hat]]]]?  
 Who believes that I thought with whom Jakob  $t_i$  spoken has
- c. Wer glaubt [<sub>CP</sub> was ich meinte [<sub>CP</sub> mit wem<sub>i</sub> [<sub>IP</sub> Jakob  $t_i$  gesprochen hat]]]]?  
 Who believes that I thought with whom Jakob  $t_i$  spoken has

In 7a, we see that the English-like version of the sentence is grammatical in German, with the higher *wh*-phrase moved to Spec of the matrix CP and the lower one in situ. In 7b, we see that the lower one cannot move to the Spec of an intermediate CP without a scope marker in the Spec of the higher intermediate CP, while in 7c, we see that such movement is perfectly grammatical when the higher intermediate CP has a scope marker in it.

Are there differences between the two, or is it simply a case of *movementus interruptus* — a movement that can take place at LF getting half-way there before Spell-Out? In fact, it seems like 7a and 7c are not simple synonymous paraphrases. The scope marking strategy, for instance, is blocked by negation (Rizzi):

8. a. Mit wem<sub>i</sub> glaubstdu nicht [dass Hans  $t_i$  gesprochen hat]?  
 With whom<sub>i</sub> believe you not that Hans  $t_i$  spoken has  
 "Who don't you think Hans has talked to?"
- b. \*Was glaubstdu nicht [mit wem<sub>i</sub> [Hans  $t_i$  gesprochen hat]]?  
 SCOPE believeyou not with whom<sub>i</sub> Hans  $t_i$  spoken has?  
 "Who don't you think Hans has talked to?"

Watanabe says that these facts lead Boskovic to propose an LF-feature movement analysis of scope-marking.

One final interesting thing. Contrast the English dialogues below:

9. i) A: What did everyone bring?  
 B: Everyone brought potato salad.

- ii) A: What did everyone bring?  
 B: John brought chips and dip, Sue brought a casserole, Bill brought wine...

Notice that B's answer in (ii) would also be appropriate to answer the question "Who brought what?" That is, a *wh*-phrase in the scope of a quantifier can generate a pair-list answer, as well as a single DP answer. These two answers correspond to two different scopes for the universal quantifier and the *wh*-operator:

- Wh(y) (x) (x brought y). "What is the y such that every person brought y?"  
 (x) Wh(y) (x brought y). "For every person x, what did x bring?"

(Notice that *Who brought everything?* doesn't even begin to admit of an answer like B — the *wh*-operator *has* to take wide scope).

In Japanese, as we've seen, a quantified subject phrase must occur to the right of an object *wh*-phrase — that is, here's one case where it looks like some kind of *wh*-movement is necessary in Japanese:

10. a. \*?daremo-ga nani-o katta no?  
 Everyone-NOM what-ACC buy Q  
 "What did everyone buy?"  
 b. nani-o daremo-ga katta no?  
 what-ACC everyone-NOM buy Q  
 "What did everyone buy?"

The Chinese equivalent of 10a is well-formed, however:

11. meigeren dou mai-le shenme?  
 everyone all buy-PERF what?  
 "What did everyone buy?"

What's even more interesting is that the Chinese sentence, but not the grammatical Japanese sentence in 10b, admits of a pair-list answer, like the English *wh*+quantifier question above.

So that's another respect in which *wh*-in-situ languages can differ. (The scope-marking languages we've seen seem to behave like English and Chinese in this regard).

Given that we've got some evidence that *wh*-movement and quantifier scope can interact, we can now explore the idea that quantifiers move covertly to take scope at LF. We'll look at that next week, when we consider Huang's article, and also

→ other species of variables: parasitic gaps, ACD and comparative deletion