

## Wh-scope Puzzles \*

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### 1. Background —Prosody-scope correlation in Japanese Wh-questions

For a long time, syntacticians have had a tendency not to take prosodic factors into consideration in obtaining grammaticality judgments, in some cases intentionally so. Several recent works converged on the view of research methods, however, which calls for the necessity to pay close attention to prosody even in the formal study of syntax. Deguchi and Kitagawa (2002), Kitagawa and Deguchi (2002) and Ishihara (2002), for instance, argued that it is essential to examine prosody in order to fully understand the scope interpretation of Wh-questions in Japanese. They point out that Wh-questions in Japanese must be generally accompanied by "Emphatic Prosody (EPD)" (or "Focus Intonation (FI)" in Ishihara's terminology) as in (1a) below. EPD consists of, first, an *emphatic accent* on the Wh-focus, which consists of sharp rise of  $F_0$  (indicated by **BOLD CAPITALS**) followed by its fall, and second, *post-focal reduction*, which virtually (though not entirely) suppresses all lexical and phrasal H accents up to the end of some clause by compressing their pitch and amplitude range (indicated by **shade**). Independently of EPD, interrogative rise intonation (indicated by  $\uparrow$ ) is added at the end of an utterance in the matrix Wh-question, which terminates post-focal reduction. The same Wh-question sounds unnatural when it is pronounced without EPD as in (1b), with the lexical accent of the head of each phrase merely retained (as indicated by a  $\odot$  circle). This non-emphatic prosody is perfectly natural in a declarative sentence as in (1c).

- (1) a. **DA**re-ga itumo ohiru-ni piza-o taberu-**no** $\uparrow$   
who-NOM always lunch-for pizza-ACC eat-COMP<sub>Wh</sub>  
'Who always eats pizza for lunch?'
- b. # $\odot$ (da)re-ga  $\odot$ (i)tumo o $\odot$ (hi)ru-ni  $\odot$ (pi)za-o taberu-no $\uparrow$

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- c. (Jo)hn-wa (i)tumo o(hi)ru-ni (pi)za-otaberu. 'John always eats pizza for lunch.'  
-TOP

They then pointed out that the domain of EPD coincides with the scope domain of Wh — the [+Wh] CP at which EPD ends corresponds to the scope domain of a Wh-phrase. Therefore, when a Wh-question is accompanied by *Local EPD*, which ends at the subordinate COMP as in (2) below, subordinate Wh-scope is obtained and the sentence is interpreted as containing an indirect Wh-question.

- (2) Keesatu-wa [ kanozyo-ga **DA**re-to atteita-ka ] (i)mademo sirabeteiru-no↑  
police-TOP she-NOM who-WITH seeing-COMP<sub>Wh</sub> still searching-COMP<sub>Y/N</sub>  
'Are the police still investigating [ **who**<sub>1</sub> she was seeing **t**<sub>1</sub> ]?'

Crucially, post-focal reduction in this sentence stretches only up to the subordinate COMP, as the retention of the H tone in the matrix indicates. When the same Wh-question is accompanied by *Global EPD* as in (3) below, on the other hand, matrix Wh-scope is obtained and the sentence is interpreted as a direct Wh-question. Note that post-focal reduction continues up to the matrix COMP in this case.<sup>1, 2</sup>

- (3) Keesatu-wa [ kanozyo-ga **DA**re-to atteita-ka ] imademo sirabeteiru-**no**↑  
police-TOP she-NOM who-WITH seeing-COMP<sub>Whether</sub> still searching-COMP<sub>Wh</sub>  
'**Who**<sub>1</sub> are such that the police are still investigating [**whether** she was seeing **him**<sub>1</sub> ]?'

Deguchi and Kitagawa (2002) also point out that this prosody-scope correlation is observed in multiple Wh-question in Japanese in the form of the correspondence between what they call *Complex EPD*, in which more than one EPD is compounded and ends at the same COMP, and a "pair-wise" interpretation, which arises when more than one Wh-phrase takes synchronized scope. In (4a), Complex EPD ends at the subordinate COMP (as indicated by two boxes) and both Wh-phrases must take subordinate scope, while in (4b-c), Complex EPD stretches to the matrix COMP and both Wh-phrases must take matrix scope.

<sup>1</sup> At least the seed of these observations can be found also in Tomioka (1997) on Japanese and Lee (1982) and Choe (1985) on Korean. Kubo (2001) also reports similar but somewhat different prosody-scope correlation in Wh-questions in the Fukuoka dialect of Japanese. Hirotsu (2003) and Hirotsu (2004), on the other hand, report that a sizable number of speakers in her perception experiment could interpret Wh-questions accompanied by *Global EPD* as indirect questions. Many of the example sentences used in her experiments, however, are biased, involving semantics and pragmatics that strongly encourage indirect question interpretations. See Kitagawa and Fodor (2003) for relevant discussion on this issue.

<sup>2</sup> In *Local EPD*, the subordinate COMP also tends to be (though not necessarily) accompanied by a short pause while *Global EPD* is not. *Local EPD* and *Global EPD* were also called Short EPD and Long EPD, respectively, in Deguchi and Kitagawa (2002), Kitagawa and Deguchi (2002). Some recordings of EPDs can be heard by visiting <http://www.iub.edu/~ykling/Symposium.html>.

- (4) a. Keesatu-wa [ano-ban **DAre-ga DAre-to atteita-ka**] mi(nna)-ni  
 police-TOP that-night who-NOM who-WITH seeing-COMP<sub>Wh</sub> everyone-DAT  
 tazuneta-no ↑  
 asked-COMP<sub>Y/N</sub> 'Did the police ask everyone [ **who** was with **whom** that night ]?'
- b. Keesatu-wa [ano-ban Mary-ga **DAre-to atteitta-ka DAre-ni tazuneta-no**] ↑  
 police-TOP that-night -NOM who-WITH seeing-COMP<sub>Whthr</sub> who-DAT asked-COMP<sub>Wh</sub>  
 'Who<sub>1</sub> are such that the police asked **whom** *whether* Mary was with him<sub>1</sub> that night?'
- c. Keesatu-wa [ano-ban **DAre-ga DAre-to atteitta-kadooka**] kimi-ni tazuneta-no ↑  
 police-TOP that-night who-NOM who-WITH seeing-COMP<sub>Whthr</sub> you-DAT asked-COMP<sub>Wh</sub>  
 'Who<sub>1</sub> are such that the police asked you *whether* **he**<sub>1</sub> was with **whom** that night?'

Since the observations here revealing the grammaticality of (3) and (4c) suggest that Wh-questions in Japanese are not constrained by the Subjacency Condition for movement, it leaves room for the possibility that scope of interrogative Wh-phrases in Japanese is determined independent of movement. This work discusses some puzzling scope phenomena, whose explanation would lead us to postulate a Wh-scope-determining mechanism which is in perfect harmony with this implication.

## 2. Puzzles

When we reanalyze Wh-questions in Japanese paying attention to the prosody-scope correlation described above, many puzzling scope phenomena come to be observed anew. Since prosody plays an essential role in the examples we will examine, readers must assign the prosodic pattern indicated on each example in interpreting them.

### 2.1. Anti-scope-synchronization of *WH-P* and *wh-P*

To begin with, as we have already confirmed with the contrast between (1a) and (1b) above, Wh-phrases in general must be focalized in a sentence. This generalization holds even in multiple Wh-questions, as illustrated by the contrast in (5). (In what follows, Complex EPD will be indicated by the combination of single and double underlines rather than two boxes for ease of presentation.)

- (5) a. DAre-ga asoko-de NAni-o katta-no ↑? 'Who bought what there?'  
 who-NOM there what-ACC bought-COMP<sub>Wh</sub>
- b. #DAre-ga asoko-de nani-o katta-no ↑?

In (5a), the two Wh-phrases accompanied by Complex EPD exhibit synchronized scope and the sentence is grammatical with the resulting "paired foci" interpretation. When one of the Wh-phrases (*nani* 'what') fails to be focused in the same sentence as in (5b), on the other hand, the sentence does not permit the two Wh-phrases to synchronize in scope.

The sentence in fact fails to provide any legitimate Wh-question interpretation except as an echo question a dialogue between two speakers as in (6).

- (6) A: John-wa asoko-de **NA**ni-o katta-**no**↑? 'What did John buy there?'  
 John-TOP there what-ACC bought-COMP<sub>Wh</sub>  
 B: E? **DA**re-ga asoko-de **nani**-o katTA-NO↑?  
 Huh who-NOM there what-ACC bought-COMP<sub>Wh</sub>  
 'Huh? What did WHO BUY THERE?'

(6B) as an echo question is accompanied by its distinctive rising intonation starting in the middle of the predicate (as indicated by the capitalization in *katTA* 'bought') and is answerable with something like *John(-desu-yo)*. '(It is) John,' which provides the identity of only the focused Wh-phrase. (5b) without such a context, on the contrary, cannot provide any legitimate Wh-scope interpretation, and is ungrammatical as a multiple or any other non-echo Wh-question. A sentence like (5b) becomes grammatical, however, when we embed it in another Wh-interrogative clause as in (7), and assign the scope interpretation of the two Wh-phrases as indicated there.

- (7)   
 Amy-wa [**DA**re-ga asokode **nani**-o katta-**ka**] sonnani siritagatteiru-**no**↑?  
 -TOP who-NOM there what-ACC bought-COMP<sub>Wh</sub> that.much want.to.know-COMP<sub>Wh</sub>  
 |.....|  
 'WHO<sub>1</sub> is such that Amy wants to know so eagerly [*what* *he*<sub>1</sub> bought there]?'  
 |.....|

One obvious difference between (5b) and (7) is that the latter permits a focused Wh-phrase and a non-focused one each to take scope in a distinct CP while the former does not have any room for this option. Their contrast therefore suggests that a focused Wh-phrase and a non-focused Wh-phrase cannot synchronize in their scope even when they are located in the same CP. Let me refer to this phenomenon as "anti-scope-synchronization between a focus Wh-phrase and a non-focus Wh-phrase."

## 2.2. Anti-scope-synchronization of *WH-P* and *FP*:

We encounter another interesting interpretive puzzle when we extend our investigation on prosody-scope correlation from Wh-focus to non-Wh-focus. We observe first that a non-Wh-focus phrase in Japanese is also generally accompanied by EPD, whether it is a presentational focus as in (8a-c) or a contrastive focus as in (9a-c).

- (8) a. **JO**hn-ga Mary-ni kagi-o watasimasita  
 -NOM -DAT key-ACC handed  
 'It is John who handed a key to Mary.'  
 b. John-wa **MA**ry-ni kagi-o watasimasita  
 -TOP  
 'It is Mary to whom John handed a key.'

- c. John-wa Mary-ni ka**GI**-o watasimasita  
'It is a key that John handed to Mary.'
- (9) a. **JO**hn-wa Mary-ni kagi-o watasimasita  
-CONTR  
'At least John handed a key to Mary.'
- b. John-wa **MA**ry-ni-wa kagi-o watasimasita  
-TOP -DAT-CONTR  
'John handed a key at least to Mary.'
- c. John-wa Mary-ni ka**GI**-wa watasimasita  
-TOP -CONTR  
'John handed at least a key to Mary.'

An interesting contrast arises when we introduce both Wh-focus and non-Wh-focus into a single sentence as in (10a-b).

- (10) [ Someone talking about professional baseball teams says: ]
- a. Oonaa-wa [ **DA**re-ga tugi-no kantoku-ni-naru-**ka** ] // **SE**nsyutati-ni osienakatta-**no** ↑  
owner-TOP who-NOM next manager.become-COMP<sub>Wh</sub> players-DAT informed-COMP<sub>Y/N</sub>  
'Was it to the players that the owner did not inform who would be the next manager?'
- b. #Oonaa-wa [ **DA**re-ga tugi-no kantoku-ni-naru-**to** ] **SE**nsyutati-ni osienakatta-**no** ↑  
-COMP<sub>THAT</sub> -COMP<sub>Wh</sub>

(10a) contains a subordinate CP headed by an interrogative COMP *-ka*. When separate EPD is assigned to focus in each clause, the sentence is interpretable, presumably with each focus taking scope in a distinct CP. (// in (10a) indicates a little pause inserted to separate the two instances of EPD.) (10b), on the other hand, is quite awkward when two separate local EPDs same as in (10a) are assigned, which would require the Wh-focus to be associated with the declarative COMP *-to* in the subordinate CP. What is puzzling is that (10b) still cannot be interpreted in any legitimate way even when it is assigned (single) Complex EPD as indicated there, which should have permitted the subordinate Wh-focus to be successfully associated with the interrogative COMP in the matrix CP. This observation suggests that Wh-focus and non-Wh-focus are not interpretable when they are forced to take scope under the same CP. We will refer to this phenomenon as "anti- scope-synchronization of a Wh-focus phrase and a non-Wh focus phrase."

### 3. Proposals and arguments:

To deal with these scope puzzles, we first establish a "Case-sensitive" labeling of all the relevant types of phrases and notions, as summarized in (11).

- (11) a. **WH**-P ("Big Wh-P") = *Focus Wh*-phrase  
b. **wh**-P ("Small Wh-P") = *Non-focus Wh*-phrase  
c. **FP** = *Non-Wh focus* phrase (both presentational and contrastive)  
d. **Wh** = Reference to Wh- in general as in "Wh-question, Wh-phrase, Wh-in-situ"

We then propose that the scope of *WH*-Ps, *wh*-Ps and *FP*s is determined when each of them is associated with a specific formal feature of COMP as summarized in (12).

- (12) a. COMP [*wh*]: COMP with a **wh**-feature (= an interrogative feature) is *unselectively* associated with one or more *wh*-Ps.  
 b. COMP [*F*]: COMP with an **F**-feature (= an emphatic feature) is associated with an *FP*.  
 c. COMP [*WH*]: COMP with a **WH**-feature (= an interrogative emphatic feature), is *unselectively* associated with one or more *WH*-Ps.

The association of COMPs with *wh*-Ps, *FP*s and *WH*-Ps takes place both at PF and LF by means of agreement involving their shared feature [*wh*], [*F*], or [*WH*], along the line of Kitagawa and Deguchi (2002).<sup>3</sup> I also assume that some economy principle prohibits any COMP feature from being redundantly introduced into a syntactic representation.<sup>4</sup> Note that a *wh*-feature is characterized by its interrogative property and an *F*-feature by its emphatic property, and crucially, a *WH*-feature is regarded as a hybrid feature which has both interrogative and emphatic properties. This means that the introduction of the features [*WH*] and [*wh*] to a single COMP is prohibited due to the redundancy of an interrogative property. Likewise, the features [*WH*] and [*F*] cannot be introduced simultaneously to a single COMP because of the redundancy of an emphatic property.

Let us now re-examine the anti-scope synchronization phenomena observed above with the proposed scope-determining mechanism. First, we saw a contrast in (5) repeated below — more than one *WH*-P can be successfully interpreted as "paired foci" when they are accompanied by Complex EPD as in (5a), but the same construction cannot be legitimately interpreted (except as an echo question) when one of the *Wh*-phrases fails to be focused as in (5b).

- (5) a. **DA**re-ga asoko-de **NA**ni-o katta-**no**↑? 'Who bought what there?'  
 who-NOM there what-ACC bought-COMP<sub>[WH]</sub>  
 |.....|.....|  
 b. #**DA**re-ga asoko-de *nani*-o katta-**no**↑?  
 who-NOM what-ACC -\*COMP<sub>[WH][wh]</sub>  
 |.....|.....|

The contrast here arises because the unselective association of two *WH*-Ps with COMP [*WH*] as in (5a) is legitimate while association of a *WH*-P and a *wh*-P with a single

<sup>3</sup> I tentatively assume that this association yields Reinhart (1997)'s "choice function" as its semantic consequence. It is not clear to me if more than one *FP* may be also unselectively associated with a single COMP [*F*].

<sup>4</sup> We may consider that this is a specific instance of the economy on lexical information argued for in Kitagawa (1999), which requires the grammar to examine and evaluate a reference set at LF in terms of the amount of lexical information involved in the representation.

COMP as in (5b) would require COMP to have both [WH] and [wh], which is not possible because of the redundancy of an interrogative property.

We also observed above that, in contrast to (5b), a WH-P and a wh-P can still co-occur when they take distinct scope as in (7).

- (7)
- |  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  |   |
|  |  | Amy-wa [DAre-ga asokode <i>nani</i> -o katta- <i>ka</i> ]   |  | sonnani siritagatteiru- <i>no</i> ↑?        |
|  |  | -TOP who-NOM there what-ACC bought-COMP <sub>[wh]</sub>   |  | that.much want.to.know-COMP <sub>[WH]</sub> |
|  |  | .....   |  | .....                                       |
|  |  | 'WHO <sub>1</sub> is such that Amy wants to know so eagerly [ <i>what</i> <i>he</i> <sub>1</sub> bought there ]?' |  |   |

We also predict this phenomenon, since each Wh-phrase (WH-P and wh-P) is legitimately associated with an appropriate type of COMP (COMP [WH] and COMP [wh], respectively) in its own clause. When we replace the subordinate COMP with a declarative COMP *-to* and use an appropriate predicate in the matrix as in (7') below, on the other hand, both WH-P and wh-P would be forced to be associated with the matrix COMP [WH][wh], which again is prohibited, and the sentence becomes uninterpretable.

- (7')
- |  |  |   |  |                                 |
|--|--|---|--|---------------------------------|
|  |  |   |  |                                 |
|  |  | #... [DAre-ga asoko-de <i>nani</i> -o katta- <i>to</i> ]  |  | imademo omotteiru- <i>no</i> ↑? |
|  |  | who-NOM what-ACC -COMP <sub>THAT</sub> still think- <i>*COMP</i> <sub>[WH][wh]</sub>                                  |  | .....                           |
|  |  | .....   |  | .....                           |
|  |  | 'Who <sub>1</sub> is such that Amy still thinks [ <i>that</i> (s) <i>he</i> <sub>1</sub> bought <i>what</i> there ]?' |  |                                 |

We also pointed out above a contrast in (10) repeated below, in which a WH-P appears in a CP embedded in a clause which contains an FP. The sentence is interpretable if the subordinate CP is interrogative ((10a)) but not interpretable if it is declarative ((10b)).

- (10) a. Oonaa-wa [DAre-ga tugi-no kantoku-ni-naru-*ka* ] //SEnsyutati-ni osienakatta-*no* ↑  
owner-TOP **who**-NOM next manager.become-COMP<sub>[WH]</sub> **players**-DAT informed-COMP<sub>[F]</sub> ↑  
|.....| |.....|  
'Was it to the players that the owner did not inform who would be the next manager?'
- b. #Oonaa-wa [DAre-ga tugi-no kantoku-ni-naru-*to* ] SEnsyutati-ni osienakatta-*no* ↑  
|.....| |.....|  
-COMP<sub>THAT</sub> | |.....|  
|.....| |.....|  
-*\*COMP*<sub>[WH] [F]</sub>

This contrast also follows from the proposed scope-determining mechanism. Since the WH-P and FP in (10a) can be associated with COMP [WH] and COMP [F], respectively in two distinct clauses, the sentence is legitimately interpreted. In (10b), on the other hand, the declarative COMP in the subordinate CP forces the WH-P and FP to be associated with a single, illegitimate COMP with both [WH] and [F]. For the same reason,

(10a) also becomes uninterpretable if *Global EPD* is assigned, the subordinate COMP *-ka* is to be interpreted as *whether*, and the *WH-P* in the subordinate clause is forced to be associated with the matrix COMP, which now would have to be an illegitimate COMP [WH][F]. The anti-scope-synchronization effects involving *WH-P*s, *wh-P*s, and *FP*s thus follow from the proposed scope-determination mechanism, whose analyses are summarized in (13).

(13) a. Permitted:

Type of COMP	COMP [ <i>wh</i> ]	COMP [ <i>F</i> ]	COMP [ <i>WH</i> ]	COMP [ <i>F</i> ] [ <i>wh</i> ]
Feature properties	interrogative	emphatic	interrogative & emphatic	interrogative & emphatic
Associated phrases	<i>wh-P</i>	<i>FP</i>	<i>WH-P</i>	<i>FP &amp; wh-P</i>

b. Prohibited:

Type of COMP	*COMP [ <i>F</i> ] [ <i>WH</i> ]	*COMP [ <i>WH</i> ] [ <i>wh</i> ]
Feature properties	<b>emphatic &amp; [emphatic &amp; interrogative]</b>	[emphatic & <b>interrogative</b> ] & <b>interrogative</b>
Associated phrases	* <i>FP &amp; WH-P</i>	* <i>WH-P &amp; wh-P</i>

Note that, as described in the last column in (13a), the proposed system also predicts that the features [*F*] and [*wh*] can be simultaneously introduced under a single COMP and be associated with an *FP* and a *wh-P* at the same time since no conflict or redundancy should arise in this situation. Such a construction indeed seems to be possible and a sentence like (14) can be properly interpreted.

(14)

	-----	
Zyaa	-----	
then	-----	
	-----	

**John-wa nani-o eranda-no** ↑? 'Then, what did **JOHN** select?'  
 then -CONT what-ACC selected-COMP [F][wh]

#### 4. Further motivation — working out more puzzles

##### 4.1. Pseudo-superiority effect

Attempting to motivate overt Wh-movement in Japanese, Takahashi (1993: 664) reports awkwardness induced by long-distance scrambling of a Wh-phrase as in (15), which he considers to be an instance of Superiority effect.

(15) ??*Nani*<sub>1</sub>-o John-ga *dare*-ni [ Mary-ga *t*<sub>1</sub> tabeta-to ] itta-no?

what-ACC -NOM who-DAT -NOM | ate-COMP<sub>THAT</sub> said-COMP<sub>wh</sub>  
 ↑ \_\_\_\_\_  
 'What<sub>1</sub> is such that John said to whom that Mary ate it<sub>1</sub>?'

In one of the footnotes, however, he also reports (16).





konpyuutaa-kara syookyositesimatta koto ]-o sitta  
 computer-from deleted fact-ACC came.to.know  
 'We came to know that they had deleted **each one's** file from **each one's** computer.'

Here, both instances of *zibun* can be bound by the matrix subject *watasitati* 'we', or they can be both bound by the subordinate subject *karera* 'they'. Either combination of the "mixed" binding, one *zibun* bound by *we* and the other by *they*, however, is not permitted. The binding of more than one *zibun*, in other words, must be synchronized.

Second, as has been observed by Baker (1970), a Wh-in-situ in English within an embedded clause like (21) below is permitted to be paired with the Wh-phrase in the Spec of either matrix or subordinate CP.

(21) [<sub>CP</sub> **Who** knows [<sub>CP</sub> **when** George received *what* ] ]?

Therefore, when two Wh-phrases appear in situ in the subordinate CP as in (22) below, we expect that four distinct combinations of such "Wh-pairing" will be possible.

(22) [<sub>CP</sub> **Who** knows [<sub>CP</sub> **when** George received *what* from *whom* ] ]?

It, however, is restricted in a very peculiar way. The two Wh-phrases in situ can be paired, as expected, with the Wh-phrase in the Spec of either matrix or subordinate CP in an across-the-board (ATB) fashion, and (22) can be interpreted as a Wh-question asking for the identity of *who*, *what* and *whom* (with ATB matrix Wh-pairing) or *who* only (with ATB subordinate Wh-pairing). They fail to be paired with the Wh-phrase in Spec-CP, on the other hand, in any mixed way, and the sentence cannot be interpreted as a question asking for the identity of only *who* and *what* (involving an indirect Wh-question concerning *when* and *whom*) or only *who* and *whom* (involving an indirect question concerning *when* and *what*). In short, the Wh-pairing involving more than one Wh-in-situ is also required to be synchronized.

Third, Carlson (1987) points out that *different* in English may exhibit a type of distributive interpretation that arises when implicit comparison between two (or more) elements arises in a plural eventuality. Thus, the sentence in (23) below may describe the situation like "John saw 'Fahrenheit 9/11' and Mary saw 'Lost in Translation'," while it may also exhibit collective interpretations like "John and Mary saw movies distinct from previous choices," "John and Mary saw movies distinct from other people's choice," or "John and Mary saw movies that are novel or unusual."

(23) John and Mary saw **different** movies.

He then observes that such a distributive interpretation can be either transparent (de re) or opaque (de dicto) in a sentence like (24).

(24) John and Mary<sub>1</sub> want [ PRO<sub>1</sub> to visit **different** places next Sunday ].

Here, *different places* may be interpreted as something like "the place desired by John and the place independently desired by Mary, which happened to have been distinct like a museum and a library" (transparent reading) or as something like "any place that is distinct from the other person's choice, whatever place that may be" (opaque reading). Carlson argues that such ambiguity is caused by the involvement of more than one plural eventuality, in (24) for instance, by the two plural eventualities in (25).

- (25) a. John and Mary's wanting X  
 b. PRO's (= John and Mary's) visiting Y

Given all these, when two instances of *different* appear in the same construction as in (26) below, we expect that four distinct combinations of the distributive interpretations of *different* will be available.

- (26) John and Mary<sub>1</sub> want [ PRO<sub>1</sub> to visit **different** places on **different** weekends ].

Here, both instances of *different* may undergo the process of "differentiation" (= implicit comparison yielding a distributive interpretation) being associated with the matrix eventuality (25a) or the subordinate eventuality (25b), and yield an "ATB-transparent" interpretation like "John wants to visit a museum this weekend, and Mary wants to visit a library next weekend," or an "ATB-opaque" interpretation like "John and Mary each wants to visit a place that is not the choice of the other on the weekend that is not the choice of the other." The two instance of *different* may never undergo differentiation separately, and neither of the "mixed" interpretations are available. (26) therefore may never be interpreted as "John wants to visit a museum, and Mary wants to visit a library, and they each wants to do that on the weekend that is not the choice of the other," or "John and Mary each wants to visit a place that is not the choice of the other, and John wants to do that this weekend and Mary wants to do that next weekend." Thus, we may conclude that "differentiation" in English presents yet another case of obligatory synchronization. By now, we can confidently state that all of these seemingly independent grammatical restrictions are of the same nature, although what exact formal properties they share is not immediately clear.

An important clue can be obtained, however, when we appeal to the insight Reinhart and Reuland (1993) offered in reformulating Condition A of the binding theory, which they now regard as a grammatical constraint that guarantees the correspondence between the existence of reflexive interpretation of a predicate and the presence of grammatical marking of reflexivity in a sentence. What this approach presupposes is the view that a reflexive relation holding between two NPs is established by way of the reflexive property of the predicate, as illustrated in (27)

- (27) [<sub>VP</sub> NP<sub>1</sub> ... V ...NP<sub>2</sub> ]  
 |.....||.....|

Reflexivity expressed by *zibun* in Japanese then is characterized by the fact that the pro-form (NP<sub>2</sub> in (27)) can be associated with the mediating predicate (V in (27)) even if it is

not located immediately under its projection (VP) but is located in a lower position. When we pay attention to this head-mediating character of reflexive binding in Japanese, the obligatory synchronization of multiple reflexive binding can be regarded as prohibition against whichever combination of the unsynchronized association between *zibun* and a head verb (whose external argument is the antecedent), e.g., as in (28).

- (28)
- |               |             |                      |                      |                             |                  |  |  |
|---------------|-------------|----------------------|----------------------|-----------------------------|------------------|--|--|
|               |             |                      |                      |                             |                  |  |  |
| watasitati-wa | [ karera-ga | <b>zibun</b> -no ... | <b>zibun</b> -no ... | <b>syookyositesimatta</b> ] | ... <b>sitta</b> |  |  |
| we-TOP        | they-NOM    | self's               | self's               | deleted                     | learned          |  |  |
|               |             |                      |                      |                             |                  |  |  |

When we extend this analysis to multiple "Wh-pairing" in English, its obligatory synchronization can be also regarded as prohibition against the unsynchronized association between Wh-in-situ and **COMP** (which hosts a moved Wh-phrase), e.g., as in (29).

- (29)
- |  |                       |   |                                 |                  |                  |  |  |
|--|-----------------------|---|---------------------------------|------------------|------------------|--|--|
|  |                       |   |                                 |                  |                  |  |  |
| [ <sub>CP</sub> <i>Who</i> <b>COMP</b> | [ <sub>IP</sub> knows | [ <sub>CP</sub> <i>when</i> <b>COMP</b> | [ <sub>IP</sub> George received | <i>what</i> from | <i>whom</i> ] ]? |  |  |
|  |                       |   |                                 |                  |                  |  |  |

We can offer a similar analysis of the obligatory synchronization of multiple "differentiation" as prohibition against the unsynchronized association between *different* and a verb (which introduces a plural eventuality), e.g., as in (30).

- (30)
- |                            |             |                             |                            |                             |  |  |  |
|----------------------------|-------------|-----------------------------|----------------------------|-----------------------------|--|--|--|
|                            |             |                             |                            |                             |  |  |  |
| John and Mary <sub>1</sub> | <b>want</b> | [ PRO <sub>1</sub> to visit | <i>different</i> places on | <i>different</i> weekends ] |  |  |  |
|                            |             |                             |                            |                             |  |  |  |

Note that the restrictions here cannot be reduced to Relativized Minimality (Rizzi (1990)), Defective Intervention (Chomsky (2000)) or LF-intervention (Beck and Kim (1997)) since "across-the-board" non-local head-association is possible in all these constructions, as we have already observed on (20), (22) and (26) above, despite the intervention of a more local head or *zibun*/Wh-in-situ/*different* as a competitor.

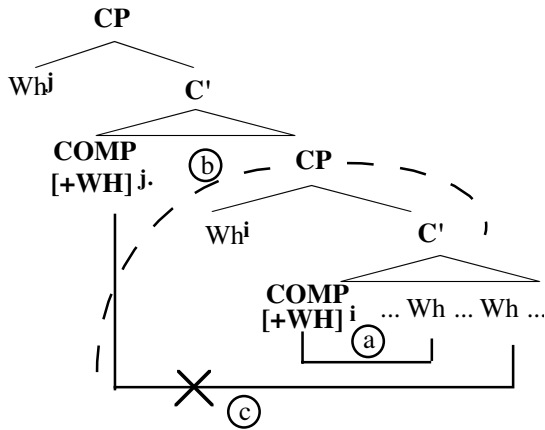
In order to capture this novel type of locality restriction, Kim and Kitagawa (2002) propose what they call Relativized Opacity as in (31), which in a sense defines a type of barrier induced by head features.

- (31) One **actual** instance of head-licensing (Ⓐ) makes its maximal projection **opaque** (Ⓑ) for the **same type of licensing** from outside (Ⓒ).

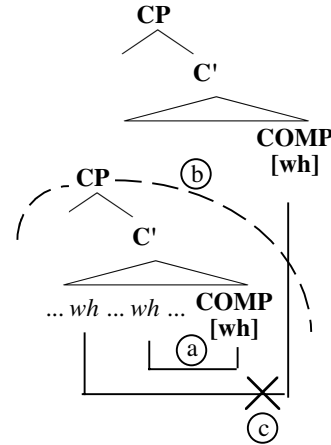
Relativized Opacity captures the problem in (29), for instance, as illustrated in (32a) below, in which the local head-association (Ⓐ) turns the maximal projection of this head

into a barrier (ⓑ) for the non-local head-association of the same kind (ⓒ), and violates Relativized Opacity, yielding the obligatory synchronization phenomenon we have observed in (22). (We will return to (32b) in 4.2.2 below.)

(32) a.



b.



This constitutes the second step of our investigation of the obligatory scope synchronization phenomena involving Wh-phrases.

#### 4.2.2. Obligatory scope-synchronization of *wh*-Ps and *WH*-Ps revisited

We can now reach the third and final step of our investigation and point out that obligatory scope synchronization of *wh*-Ps in (18) also can be straightforwardly reduced to Relativized Opacity. The unsynchronized multiple association between *wh*-Ps and COMPs as in (18') violates Relativized Opacity as illustrated in (32b) above, the local head-association (ⓐ) creating a barrier (ⓑ) for the non-local head-association (ⓒ). The obligatory scope synchronization of *WH*-Ps observed in (19) can be captured in the same way.

(18')

M <u>A</u> ry-wa	[ John-ga	<i>dare</i> -ni	<i>nani</i> -o	watasita -ka]	oboeteiru- <b>no</b> ↑?
Mary-CONTR	-NOM	who-DAT	what-ACC	handed-COMP <sub>[wh]/Y/N</sub>	remember-COMP <sub>[F][wh]</sub>

We have argued in this section that the obligatory scope synchronization involving Wh-phrases can be assimilated to other types of obligatory synchronization phenomena and is accounted for by Relativized Opacity. Note that what permits us to achieve this account is the assumption that the scope of Wh-phrases is determined when they are associated with some specific COMP feature, involving a type of head-association, as we argued for above examining the anti-scope-synchronization phenomena. This, I believe, provides us with another piece of motivation for this approach. To sum up, I have proposed and argued that we need a much finer scope-

determining mechanism for the sentences involving Wh-phrases and focus phrases in Japanese than usually assumed, and that such scope determination can and should be done with the mediation of COMP features, perhaps totally independent of movement.

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