When We Fail to Question in Japanese*

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When we pay close attention to the prosody of Wh-questions in Japanese, we discover many novel and interesting empirical puzzles that would require us to devise a much finer syntactic component of grammar. This paper addresses the issues that pose some problems to such an elaborated grammar, and offers solutions, making an appeal to the information structure and sentence processing involved in the interpretation of interrogative and focus constructions.

Keywords: focus, (implicit) prosody, information structure, processing, Wh-question

1 Background — Some Recent Development in Formal Syntax

In this paper, I will take up some Wh-constructions in Japanese which do not seem to pose any grammatical problem but disallow us to obtain certain type of expected interrogative interpretations. In Section 1, I will summarize some recent development of a research method incorporating prosodic and other extra-syntactic/extra-grammatical analyses into the formal study of syntax. In Section 2, I will sketch out the elaborated version of "*LF E-agreement*" proposed and argued for by Kitagawa (2006). In Section 3, I will investigate

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into the nature of the puzzling phenomenon mentioned above, which would permit us to account for what is left unattended in the *LF E-agreement* approach.

1.1 Pivotal Observations

Deguchi and Kitagawa (2002) and Ishihara (2002), among others, converged on the view that we must examine prosody in order to understand the semantic and formal properties of Wh-questions in Japanese more precisely. They pointed 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 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 ↑) is added at the end of an utterance in the matrix Wh-question, which terminates post-focal reduction.

(1) a. **DA**re-ga itumo ohiru-ni piza-o taberu-**no**↑?
who-NOM always lunch-for pizza-ACC eat-COMP**Wh**
'Who always eats pizza for lunch?'

b. # ⓓare-ga ⓘtumo oⓗiru-ni ⓟiza-o taberu-no↑?
who-NOM

c. Ⓙohn-wa ⓘtumo oⓗiru-ni ⓟiza-o taberu.
John-TOP
'John always eats pizza for lunch.'

Need for EPD in (1a) can be demonstrated when we observe that 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 retained (as indicated by a

(c)ircle) and downstepped. (# on this and other examples indicates that the sentence is unacceptable with the indicated prosody (and interpretation).) This non-emphatic prosody, on the contrary, is perfectly natural in a declarative sentence as in (1c), which further indicates the close association between EPD and Wh-questions.[1]

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]

(2) Hokenzyo-wa [syokutyuudoku-kanzya-zen'in-ga
health.department-TOP food.poisoning-victim-all-NOM
NAni-o tabeta-**ka**] (ma)da kakunin-dekinai-no↑?
what-ACC ate-COMP**Wh** yet confirm-cannot-COMP**Y/N**
'Is the Department of Health yet to be able to confirm
[**what** all of those who suffered from food poisoning ate]?'

Crucially, post-focal reduction in this sentence continues only up to the subordinate COMP, as the retention of the H tone in the matrix ((ma)da 'yet')

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[1] Some recordings of EPDs can be heard by visiting "http://www.iub.edu/~ykling /SoundGallery/index.html". See Kitagawa (2005) for further arguments that EPD is a normal rather than exceptional prosodic pattern to be assigned to Wh-constructions in Japanese, contra Nishigauchi (1990). See also Maekawa (1991) for some phonetic experiments that support this point. The H tones involved in the unaccented words also undergo post-focal reduction, though I will not take them up for simplicity.

[2] In glosses of this and other examples, I will indicate each distinct function of complementizers in Japanese as $COMP_{Wh}$ (Wh-scope maker), $COMP_{Wthr}$ (a polar-question complementizer), $COMP_{Y/N}$ (yes/no question marker) or $COMP_{That}$ (declarative complementizer).

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 is extended to the matrix COMP in this case. [3, 4]

(3) Hokenzyo-wa [syokutyuudoku-kanzya-zen'in-ga
health.department-TOP food.poisoning-victim-all-NOM
NAni-o tabeta-*ka*] kakunin-siyoo-tositeiru-**no**↑?
what-ACC ate-COMP$_{\textbf{Wthr}}$ trying.to.confirm-COMP$_{\textbf{Wh}}$
'**What**$_1$ is such that the Department of Health is trying to confirm
[whether all of those who suffered from food poisoning ate it$_1$]?'

Deguchi and Kitagawa (2002) also point out that multiple Wh-questions in Japanese exhibit their prosody-scope correlation in a very specific way — in the form of the correspondence between what we may call *Compound EPD*, in which more than one EPD ends at the same COMP and makes up a unit. As a result, more than one Wh-phrase takes synchronized scope and yields a "pair-wise" (or "set") interpretation. In (4a), Complex EPD ends at the subordinate COMP and both Wh-phrases must take subordinate scope, while in (4b-c), Compound EPD is extended to the matrix COMP and both Wh-phrases must

[3] 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. Hirotani (2003) and Hirotani (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) and especially Kitagawa (2005) for the description of other factors that bias language users toward subordinate Wh-scope in this construction.

[4] In *Local EPD*, the subordinate COMP also tends to be (though not necessarily) followed 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).

take matrix scope. The two instances of EPD terminating at the identical Comp in Compound EPD is indicated by an underscore and an overscore.

(4)

a. Keesatu-wa [ano-ban **DA**re-ga **DA**re-to atteita-**ka**]
police-TOP that-night who-NOM who-WITH seeing-$COMP_{\mathbf{Wh}}$
miN(na)-ni tazuneta-no↑?
everyone-DAT asked-$COMP_{Y/N}$
'Did the police ask everyone [**who** was with **whom** that night]?'

b. Keesatu-wa [ano-ban Mary-ga
police-TOP that-night -NOM
DAre-to atteitta-ka] **DA**re-ni tazuneta-**no**↑?
who-WITH seeing-$COMP_{Wthr}$ who-DAT asked-$COMP_{\mathbf{Wh}}$
'**Who**$_1$ is such that the police asked **whom** *whether* Mary was with him$_1$ that night?'

c. Keesatu-wa [ano-ban
police-TOP that-night
DAre-ga **DA**re-to atteitta-ka] kimi-ni tazuneta-**no**↑?
who-NOM who-WITH seeing-$COMP_{\mathbf{Wthr}}$ you-DAT asked-$COMP_{\mathbf{Wh}}$
'**Who**$_1$ is such that the police asked you *whether* he$_1$ was with **whom** that night?'

1.2 Initial Grammaticalization

With these factual observations, we are now given the following mission. First, we must let the grammar of Japanese guarantee prosody-scope correlation in Wh-questions in one way or another. Second, the grammaticality of (3) and (4c) suggests that Wh-questions in Japanese are not constrained by the Subjacency Condition. If we maintain that this condition is imposed on movement, we are now obliged to determine scope of interrogative Wh-phrases in Japanese independent of movement, overt or covert.

Kitagawa and Deguchi (2002) proposed what they call "E-agreement" approach to fulfill both of these tasks at the same time. A remodeled version of

this analysis now postulates what is called "E-feature complex" of the form (E_{SEM}, E_{PHON}). This formal feature complex consists of an E-feature relevant to LF (E_{SEM}) and that relevant to PF (E_{PHON}), which are introduced under both COMP and a Wh-word (or any word that is focalized). We may consider that the E-feature complex introduced under COMP is uninterpretable while that introduced under a Wh-word is interpretable. Under Chomsky's Spell-Out analysis, only E_{PHON} would be stripped from the syntactic object and sent to PF, while E_{SEM} would be maintained through narrow syntax and the semantic component, and sent to LF. The E-feature complex induces the computational operation E-agreement between COMP and a Wh-word in the course of derivation to **both LF and PF**, and eventually uninterpretable E-features get deleted.[5] When E-agreement takes place successfully in LF-computation under a c-command relation, it comes to identify a word containing E_{SEM} as the focus and the maximal projection of the COMP containing E_{SEM} as the domain of focus. As a result, E-agreement establishes at LF a domain for Wh-scope to be assigned at the Conceptual-Intentional (C-I) system. Successful E-agreement in PF-computation, on the other hand, identifies, in a linear fashion, the lexical item carrying E_{PHON} as the starting point of focus prosody and the COMP containing E_{PHON} as its endpoint. A prosodic domain marked this way comes to be phonetically interpreted as EPD at the Articulatory-Perceptual (A-P) system.[6]

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[5] Alternatively, we may consider that the E-feature complex on both of COMP and a Wh-word is uninterpretable and there exists asymmetrical assignment of some values between them just as in Case features. Postulation of a property that derives both semantic and phonetic effects can be traced back at least to the focus marker "F" of Jackendoff (1972: 240).

[6] At this point, it is not clear if the E-agreement need to be translated into any hierarchical phonological phrasing which mediates syntax and phonetic interpretation of EPD, at least in the way proposed in the literature. Kubozono (2007: this volume) in fact reports his experimental results which indicate that Wh-focus does not reset the pitch range, which suggests that there exists no major phrase (or intermediate phrase) boundary starting there.

The two different cases of prosody-scope correlation observed in a "Wh-in-situ" sentence in (2) and (3) can be straightforwardly captured when we assume that an E-feature complex may appear in either subordinate or matrix COMP and undergo E-agreement in the course of both LF- and PF-computation, as illustrated in (5) and (6), respectively.

(5) a. ***Subordinate Scope***

LF: [$_{CP}$… [$_{CP}$… **nani**$_1$**[E]**-o tabeta]-**ka$_{COMP}$**~~**[E]**~~]mada kakunin-dekinai-no$_{COMP}$]
what-ACC

b. PF: [$_{CP}$… [$_{CP}$… **NA**ni**[E]**-o tabeta-**ka$_{COMP}$**~~**[E]**~~] (ma) da kakunin-dekinai-no$_{COMP}$↑]

Local-EPD

(6) a. ***Matrix Scope***

LF: [$_{CP}$… [$_{CP}$… **nani**$_1$**[E]**-o tabeta-ka$_{COMP}$] kakunin-siyoo-tositeiru-**no$_{COMP}$**~~**[E]**~~]]
what-ACC

b. PF: [$_{CP}$ … [$_{CP}$… **NA**ni**[E]**-o tabeta-ka$_{COMP}$] kakunin-siyoo-tositeiru-**no$_{COMP}$**~~**[E]**~~↑]

Global-EPD

In short, an E-feature complex (E_{SEM}, E_{PHON}) induces the computational operation E-agreement between COMP and a Wh-word simultaneously in LF- and PF-computation and yields a one-to-one grammatical correspondence between the domain of Wh-scope and EPD.

See Pierrehumbert and Beckman (1988), Nagahara (1994), Truckenbrodt (1995), Sugahara (2003) and Ishihara (2003), among others, for relevant discussion.

2 Elaborated Grammaticalization

Kitagawa (2006) elaborated on the computational process of LF E-agreement and claimed that the semantic E-feature (E_{SEM}) itself is complex and heterogeneous in nature and can be associated with any of *focused* Wh-phrases, *unfocused* Wh-phrases and *non-Wh focus* phrases, when it consists of a distinct combination of semantic features. First, a "Case-sensitive" labeling of distinct types of phrases and notions as summarized in (7) was established.

(7) a. ***WH***-P (to be referred to as "Big Wh-P") = *Focus Wh*-phrase

b. ***wh***-P (to be referred to as "Small Wh-P") = *Non-focus Wh*-phrase

c. ***F***P = *Non-Wh focus* phrase (both presentational and contrastive)

d. **Wh** = Reference to Wh- in general as in "Wh-question, Wh-phrase, Wh-in-situ"

Then it was proposed that the scope of *WH*-Ps, *wh*-Ps and *F*Ps is determined when each of them is associated with a specific formal feature of COMP as summarized in (8).

(8) 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 ***F***P.

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

The association of COMPs with *wh*-Ps, *F*Ps and *WH*-Ps takes place by means of *LF E-agreement* involving their shared feature [*wh*], [*F*], or [*WH*] (along with

PF E-agreement).[7] I also assume that some economy principle prohibits any COMP feature from being redundantly introduced into a syntactic representation.[8] 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. It was argued that this approach would permit us to discover and explain some puzzling scope phenomena, which would otherwise have remained unaccounted for or even unnoticed.

2.1 Novel Puzzles and Solutions #1

First, a paradigm involving multiple Wh-questions as in (9) was presented. Since prosody plays an essential role in the examples examined here, the readers must assign the prosodic pattern indicated on each example in interpreting them.

(9) a.
DAre-ga asoko-de **NA**ni-o katta-**no**↑?
who-NOM there what-ACC bought-COMP$_{\mathbf{Wh}}$
'WHO bought **WHAT** there?'

b. # **DA**re-ga asoko-de ***nani***-o katta-**no**↑?

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

[8] 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.

c.

John-wa [**DA**re-ga asokode ***nani***-o katta-***ka***] siritagatteiru-***no***↑?
John-TOP who-NOM there what-ACC bought-COMP$_{\mathbf{Wh}}$ want.to.know-COMP$_{\mathbf{Wh}}$
'**WHO**$_1$ is such that John wants to know [***what*** *he*$_1$ bought there]?'

As in (9a), the two Wh-phrases accompanied by Compound 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 (9b), on the other hand, the two Wh-phrases cannot synchronize in scope. The sentence in fact fails to provide any legitimate Wh-question interpretation, and is ungrammatical as a multiple or any other non-echo Wh-question. If (9b) is ever accepted, it must be interpreted as an echo question used in a dialogue between two speakers A and B (or A and B') as in (10).

(10) A: John-wa asoko-de **NA**ni-o katta-**no**↑?
John-TOP there what-ACC bought-COMP$_{\mathbf{Wh}}$
'What did John buy there?'

B: E? **DA**re-ga asoko-de ***nani***-o katta-ka-tte↑?
Huh who-NOM there what-ACC bought-COMP$_{\mathbf{Wh}}$-COMP$_{\mathbf{That}}$
'Huh? What did who buy there?'

B':% E? **DA**re-ga asoko-de ***nani***-o katta-no↑?
Huh who-NOM there what-ACC bought-COMP$_{\mathbf{Wh}}$
'Huh? What did who buy there?'

Some speakers find both (10B) and (10B') possible as an echo question while others accept only (10B). Whichever may be accepted, the sentence would be answered with something like *John*(*-desu-yo*) '(It is) John,' which provides the identity of only the focused Wh-phrase ***Da****re-ga* 'who-NOM'. The interrogative

interpretation of the unfocused Wh-phrase *nani-o* 'what-ACC', in other words, must be suppressed.

A sentence like (9b) becomes grammatical, however, when we embed it in another Wh-interrogative clause as in (9c) and assign the scope interpretation of the two Wh-phrases as indicated there. One obvious difference between (9b) and (9c) 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 (*WH*-P) and a non-focused Wh-phrase (*wh*-P) cannot synchronize in their scope even when they are located in the same CP. This phenomenon was referred to as *anti-scope-synchronization* between a *WH*-P and a *wh*-P.[9]

This anti-scope-synchronization phenomenon follows directly from the elaborated version of LF E-agreement introduced above. First, (9a) and (9b) come to involve COMP-Wh association as follows.

(9) a.

DAre-ga asoko-de **NA**ni-o katta-**no**↑?
who-NOM what-ACC -COMP**[WH]**
'Who bought what there?'

b. # **DA**re-ga asoko-de ***nani***-o katta-**no**↑?
who-NOM what-ACC -***COMP**[WH][wh]*

The contrast here arises because the unselective association of two *WH*-Ps with COMP [*WH*] as in (9a) is legitimate while association of a *WH*-P and a *wh*-P

[9] One possibility is that the echo questions (10B/B') involve some abbreviated version of embedding and hence are assimilated to the case like (9c). The appearance of *-ka* '-COMP**Wh**' in (10B) is suggestive of this possibility.

with a single COMP as in (9b) would require the associated COMP to have both [*WH*] and [*wh*], which is illegitimate because of the redundancy of an interrogative property.

A *WH*-P and a *wh*-P can still co-occur, on the other hand, when they take distinct scope as in (9c).

(9) c.

John-wa [**DA**re-ga asokode ***nani***-o katta-***ka***] siritagatteiru-***no***↑?
who-NOM what-ACC -COMP**[wh]** -COMP**[WH]**

'**WHO**$_1$ is such that John wants to know [***what*** *he*$_1$ 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 (11) 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.

(11)

\# John-wa [**DA**re-ga asokode ***nani***-o katta-***to***] omotteiru ***-no***↑?
who-NOM what-ACC -COMP**That** think-*COMP**[WH][wh]**

'**WHO**$_1$ is such that John still thinks [that (*s*)*he*$_1$ bought ***what*** there]?'

2.2 Novel Puzzles and Solutions #2

The "elaborated" LF E-agreement approach leads us to discover and solve another interesting interpretive puzzle when we extend our investigation 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 (12a-c) or a contrastive focus as in (13a-c).

(12) 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.'

(13) a. **JO**hn-*wa* Mary-ni kagi-o watasimasita.
-CONT(RASTIVE)
'At least John handed a key to Mary.'

b. John-wa **MA**ry-ni-*wa* kagi-o watasimasita.
-TOP -DAT-CONT
'John handed a key at least to Mary.'

c. John-wa Mary-ni ka**GI**-*wa* watasimasita.
-TOP -CONT
'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 (14a-b).

(14) [Someone talking about a professional baseball team says:]

a. Oonaa-wa [**DA**re-ga tugi-no kantoku-ni-naru-***ka***]
owner-TOP who-NOM next manager.become-$COMP_{\mathbf{Wh}}$
// **SE**nsyutati-ni osienakatta-***no***↑? Sorya mazuine.
players-DAT not.informed-$COMP_{Y/N}$ that.is unadvisable
'Was it to the players that the owner did not inform who would be the next manager? That is unadvisable.'

b. # Oonaa-wa [**DA**re-ga tugi-no kantoku-ni-naru-***to***]
-$COMP_{\mathbf{That}}$
(//) **SE**nsyutati-ni osienakatta-***no***↑
-$COMP_{\mathbf{Wh}}$

(14a) 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 (14a) indicates a little pause inserted to separate the two instances of EPD.) (14b), on the other hand, is quite awkward when two separate *Local* EPDs same as in (14a) 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 (14b) still cannot be interpreted in any legitimate way even when it is assigned a (single) *Compound 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 (*WH*-P) and non-Wh-focus (*F*P) are not interpretable when they are forced to take scope under the same CP. This phenomenon was again referred to as *anti-scope-synchronization* but this time involving a *WH*-P and a *F*P.

This contrast also follows under the "elaborated" LF E-agreement analysis:

(14) a.

Oonaa-wa [**DA**re-ga tugi-no kantoku-ni-naru-***ka***]
who-NOM -COMP**[WH]**
// **SE**nsyutati-ni osienakatta-***no***↑?
players-DAT -COMP**[F]**

'Was it to the players that the owner did not inform who would be the next manager? That is unadvisable.'

b.

\# Oonaa-wa [**DA**re-ga tugi-no kantoku-ni-naru-***to***] **SE**nsyutati-ni osienakatta-***no***↑?
who-NOM -COMP**That** players-DAT -*COMP**[WH][F]**

Since the *WH*-P and *F*P in (14a) can be associated with COMP [*WH*] and COMP [*F*], respectively in two distinct clauses, the sentence is legitimately interpreted. In (14b), on the other hand, the declarative COMP in the subordinate CP forces the *WH*-P and *F*P to be associated with a single, illegitimate COMP with both [*WH*] and [*F*] in the matrix CP. For the same reason, (14a) would not permit the matrix scope interpretation of the *WH*-P even when *Global EPD* is assigned and the subordinate COMP *-ka* is to be interpreted as *whether*.

The anti-scope-synchronization effects involving *WH*-Ps, *wh*-Ps, and *F*Ps thus follow from the "elaborated" LF E-agreement, whose analyses are summarized in (15).

(15) a. Permitted:

Type of COMP	COMP [***wh***]	COMP [***F***]	COMP [***WH***]	COMP [***F***][***wh***]
Feature properties	interrogative	emphatic	interrogative & emphatic	interrogative & emphatic
Associated phrases	*wh*-P	*F*P	*WH*-P	*F*P & *wh*-P

b. Prohibited:

Type of COMP	*COMP [***F***] [***WH***]	*COMP [***WH***][***wh***]
Feature properties	**emphatic** & [**emphatic** & interrogative **]**	[emphatic & **interrogative**] & **interrogative**
Associated phrases	*****FP* & *WH*-P	*****WH*-P & *wh*-P

Note that, as described in the last column in (15a), the proposed system also predicts that the features [*F*] and [*wh*] can be simultaneously introduced under a single COMP and be associated with an *F*P 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 (16) can be properly interpreted, in which a contrast phrase ***JO****hn-wa* as an *F*P and a *wh*-P may co-occur.

(16)

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

To sum up, the "elaborated" LF E-agreement approach offers much finer and precise feature analysis of complementizers, Wh-words and other focused items in the grammar. By requiring us to pay close attention to the prosody and information structure of these syntactic elements, this approach shows us a simple way to account for various scope restrictions imposed on them. Without this approach, we would not have even noticed the existence of such empirical problems.[10] This in turn makes us realize that we have long been trying to build a syntactic theory of Wh-constructions in Japanese based upon quite limited empirical observations.

3 Unexpected Restrictions:

When we proceed with the "elaborated" LF E-agreement approach further extending our observations, we encounter even more puzzles. They first appear to contradict with this approach but come to reveal themselves to involve problems that go beyond grammar when we examine them closely. It will be pointed out that the problems involve two distinct extra-grammatical factors — information structure and sentence processing. I will examine them in turn.

3.1 Informational Dead End

First, we have seen at the end of the previous section that an *F*P and a *wh*-P can co-occur and their scope may synchronize as in (17) (= (16)).

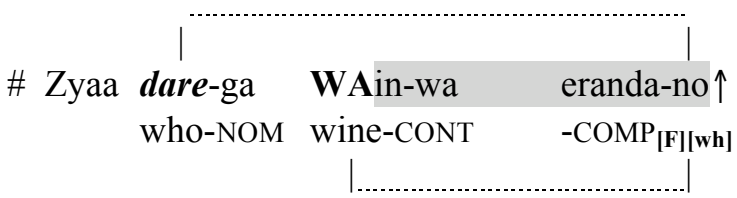
(17)

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

[10] See Kitagawa (2006) for further arguments for this approach.

When an *F*P and a *wh*-P appear in the opposite order in the same construction and pronounced accordingly as in (18), however, the sentence is noticeably awkward.

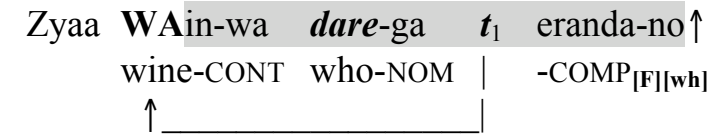
(18)



'Then, who selected (the) **WINE**?'

As indicated in each example, the association between COMP and *wh*-P/*F*P are identical and legitimate in both cases, involving [*F*] and [*wh*]. The computational process of LF E-agreement, in other words, is successfully carried out and no other grammatical problem appears to arise in (18). An interesting and appropriate observation here is that this sentence becomes acceptable again when scrambling reorders the *F*P and *wh*-P as in (19).

(19)



'Then, who selected (the) WINE?'

When we compare (17), (18) and (19), we notice that no problem arises when a *wh*-P appears between an *F*P and its associated COMP while the sentence becomes awkward when a *wh*-P fails to do so. A *wh*-P, in other words, is parasitic to the E-agreement domain of an *F*P, so to speak. Let me capture this observation as a theorematic requirement imposed on *wh*-Ps as in (20).

(20) The *wh*-P Theorem:

> A *wh*-P is parasitic to the LF E-agreement involving a focus property (= [*F*] or [*WH*]) in that the former must be provided its interpretation within the domain of the latter.

It is not clear at this point how exactly this theorem should be derived but it makes perfect sense when we consider the information structure involved in the paradigm (17)-(19). First, as Vallduvi (1992) and Vallduvi (1995) suggested, information packaging of an utterance involves its three primitives typically appearing in the order indicated in (21).

(21) Link [**FOCUS** tail]

Roughly speaking, *link* represents part of the background information that is discoursally or pragmatically anaphoric and hence signals the connection point of background and prominent information.[11] *Focus* introduces the most prominent piece of information to be conveyed and *tail* represents a truly non-salient background context into which this information is introduced. *Focus* and *tail* make up a unit that corresponds to our LF E-agreement domain, which is also prosodically realized as EPD, as indicated in (21) with our notation. In (18), the *wh*-P appears as if it were to serve as *link*, but as Tomioka (2004) points out, a Wh-word by its very nature is incapable of being anaphoric and hence cannot serve as *link* (being an "Anti-Topic Item" in Tomioka's terms). The information structure involved in (18) therefore is inappropriate. As a result, the sentence becomes awkward even if it involves legitimate LF E-agreement and is grammatical. This is a likely source of the *wh-P Theorem* in (20). When we

[11] *Link* itself can be also pragmatically accommodated. cf. Heycock (1994)

replace the *wh*-P in (18) with an item that can serve as a link as in (22), the sentence comes to be interpretable again with the same prosodic pattern.

(22) Zyaa *John*-wa **WA**in-wa eranda-no↑
John-TOP wine-CONT -COMP**[F]**
'Then, did John select (the) **WINE**?'

The *wh-P Theorem* as stated in (20) can also account for another scope restriction. First, with example (9c), we have seen above that a *WH*-P and a *wh*-P can co-occur as long as they are associated with distinct COMPs and take distinct scope.

(9) c.
John-wa [**DA**re-ga asokode ***nani***-o katta-***ka***] siritagatteiru-***no***↑?
who-NOM what-ACC -COMP**[wh]** -COMP**[WH]**
'**WHO**$_1$ is such that John wants to know [***what*** *he*$_1$ bought there]?'

What is puzzling in this regard is that the opposite scope relation of the same *WH*-P and *wh*-P as indicated in (23) is not permitted when we assign *Local* EPD — we can never let the *WH*-P take the subordinate scope and the *wh*-P take the matrix scope here.

(23)
John-wa [**DA**re-ga asokode ***nani***-o katta-***ka***] siRITA ga tteiru-***no***↑?
who-NOM what-ACC -COMP**[WH]** -COMP**[wh]**
'**WHAT**$_1$ is such that John wants to know [***who*** bought *it*$_1$ there]?'

Note that the involved LF E-agreement is legitimate here and grammar should permit this scope relation. This scope restriction follows, however, from the *wh*-

P Theorem as stated in (20) since the *wh*-P in (23) is being associated with the matrix COMP and hence is not provided its interpretation within the LF E-agreement domain involving a focus property ([*WH*] in this case).[12]

Presenting paradigm (1), we also pointed out above that Wh-questions in general require EPD.

(1) a. **DA**re-ga itumo ohiru-ni piza-o taberu-**no**↑?
who-NOM always lunch-for pizza-ACC eat-COMP**Wh**
'Who always eats pizza for lunch?'

b. # ⓓa re-ga ⓘ tumo o ⓗi ru-ni ⓟi za-o taberu-no↑?
who-NOM

---

[12] We can account for a similar contrast between the two sentences in (i). Here, the multiple *wh*-Ps can take subordinate scope within the LF E-agreement domain of a *WH*-P in (ia) but are disallowed to take matrix scope in (ib).

(i) a. Kimi-wa [John-ga
you-TOP -NOM
DAre-ni ***nani***-o ***ikura***-de utta-**ka**] mada oboeteiru-**no**↑?
who-DAT what-ACC how.much-for sold-COMP**[wh]** stillremember-COMP **[WH]**
'**WHO**$_1$ is such that you still remember [***what*** John sold to her$_1$ for ***how much***]?'

b. Kimi-wa [John-ga
you-TOP -NOM
#**DA**re-ni ***nani***-o ***ikura***-de utta-**ka**] ⓜa da oboeteiru-**no**↑?
who-DAT what-ACC how.much-for sold-COMP**[WH]** still remember-COMP**[wh]**
'***What***$_1$ is such that you still remember [**to WHOM** John sold *it$_1$* for ***how much***]?'

The LF E-agreement involved in (ib) is legitimate and also satisfies the Relativized Opacity Condition discussed in Kim and Kitagawa (2002) and Kitagawa (2006). It, however, dissatisfies the *wh-P Theorem*.

c. Ⓙohn-wa ⓘtumo oⓗiru-ni ⓟiza-o taberu.
John-TOP
'John always eats pizza for lunch.'

Having introduced the distinction between *WH*-Ps and *wh*-Ps, we now can reassess the restriction observed in (1b) as the indication that a *wh*-P is incapable of making up a matrix Wh-question by itself. This restriction also follows from the *wh-P Theorem* since the *wh*-P here certainly is not parasitic to any LF E-agreement domain involving a focus property.

Although how exactly the *wh-P Theorem* should be derived remains to be worked out, acknowledging it permits us to capture various restricted behaviors of Wh-words, which otherwise would remain to be mysterious. When we recognize the information structural nature of this theorematic requirement, we can also recognize the extra-grammatical character of the observed restrictions and maintain the integrity of the elaborated LF E-agreement analysis in our grammar.

3.2 Processing Dead End

When we extend our observations to a construction containing more than one *WH*-P, we notice a curious absence of a certain type of scope interpretations. To begin with, suppose that we try to interpret a Wh-construction as in (24), letting both *WH*-Ps there be associated with the matrix COMP as indicated:

(24)

DAre-ga[Mary-ga **NA**ni-o eranda-**ka**] oboeteiru **-no**↑?
who-NOM -NOM what-ACC chose-$COMP_{Wthr}$ remember-$COMP_{[WH]}$
'Who remembers Mary chose what?'

This mode of E-agreement lets the two *WH*-Ps synchronize their scope under the matrix CP and receive *Global Compound* EPD, yielding a legitimate direct multiple Wh-question. What is curious is that when we try to let each *WH*-P in the same sentence be associated with a distinct COMP, we fail to obtain the expected interpretation. This mode of E-agreement is described in (25a-c) in three steps.

(25) a. **DA**re-ga [Mary-ga **NA**ni-o eranda **-ka**] oboeteiru-**no**↑?
what-ACC -COMP$_{[WH]}$

b. **DA**re-ga [Mary-ga **NA**ni-o eranda **-ka**] oboeteiru **-no**↑?
who-NOM -COMP$_{[WH]}$

c. # **DA**re-ga [Mary-ga **NA**ni-o eranda **-ka**] oboeteiru **-no**↑?
who-NOM -NOM what-ACC chose-COMP$_{[WH]}$ remember-COMP$_{[WH]}$
'Who remembers what Mary chose?'

First, we let the subordinate *WH*-P ***NA****ni-o* 'what-ACC' be associated with the subordinate COMP as in (25a), which will establish subordinate Wh-scope and *Local* EPD within the embedded clause. We then let the matrix *WH*-P ***DA****re-ga* 'who-NOM' be associated with the matrix COMP as in (25b).[13] This will establish matrix Wh-scope and *Global* EPD ranging from ***DA****re-ga* to the matrix COMP. When the two are combined, we obtain (25c), which we expect to be able to interpret as a direct Wh-question embedding an indirect Wh-question. In reality, however, this interpretation is not available in (25c), while each instance

[13] It does not matter which E-agreement takes place first in the present context.

of LF E-agreement involved here is legitimate, and no other grammatical problem seems to arise in the attempt to derive this interpretation.[14] We thus face again a situation that is not anticipated in the "elaborated" LF E-agreement.

One thing we notice about (25c), however, is that the prosodic information assigned there is not distinguishable from that assigned to (24). In particular, since the lexical accent of *oBOeteiru* 'remember' in the matrix clause of (25c) is reduced in the post-focal reduction domain of the *Global* EPD starting from ***DA****re-ga*, this representation fails to provide any prosodic cue to mark the end of the *Local* EPD involved in its subordinate clause. The prosodic information assigned to (25c) therefore can be easily — perhaps inevitably — misinterpreted as a phonetic realization of *Global Compound* EPD involving both ***DA****re-ga* and ***NA****ni-o*, which encompasses the entire utterance just as in (24). If so, when we perceive the prosody provided here and attempt to process the sentence, we are forced to analyze it as involving the E-agreement as in (24) rather than (25c), making the scope interpretation in question unavailable. This analysis of the interpretive restriction in (25c) is well in accordance with the processing principle in (26) argued for by Kitagawa and Fodor (2003).[15]

(26) Maximize Prosody-Syntax Congruence (Max PSC):

> Attribute a prosodic property of a sentence to a syntactic property, and vice versa, whenever possible in processing a sentence.

Max PSC is designed to capture a very general preference for congruence between syntactic and prosodic structure in parsing, which encourages perceivers to assume a simple transparent relationship between prosody and

[14] The opposite COMP-*WH*-P association is disallowed since the matrix *WH*-P (***DA****re-ga* 'who-NOM') is not c-commanded by the subordinate COMP. See Section 1.2 above.

[15] (26) is a slightly refined version of the Structural Interpretation of Prosody Principle proposed by Fodor (2002b).

syntax wherever possible, that is, unless they encounter evidence to the contrary. It then should also force the perceiver to derive synchronized matrix scope of *WH*-Ps in both (24) and (25c) based upon the prosody perceived there.

We can also extend this approach to the analyses of the constructions involving both *WH*-Ps and *F*Ps. Observe first that we simply fail to come up with any legitimate interpretation when we combine these two types of focused items even when they appear in distinct clauses in whichever order to represent whatever scope relation, as shown in (27a-b). The general impression of the source of problem here is that both sentences involve an excessive focused item.

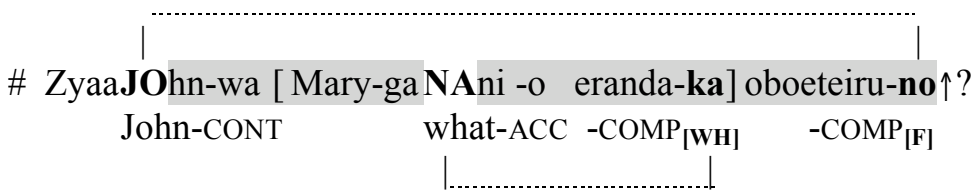
(27) a. # Zyaa**JO**hn-wa [Mary-ga **NA**ni -o eranda-**ka**] oboeteiru- **no**↑?
then -CONT -NOM what-ACC chose-COMP$_{[WH]}$ remember-COMP$_{[F]}$
(i) 'Then, **what** does **at least** John remember Mary selected?'
(ii) 'Then, does **at least** John remember **what** Mary selected?'

b. # Zyaa**DA**re-ga[Mary-ga **WA**in-wa eranda-**ka**] oboeteiru-**no**↑?
then who-NOM -NOM wine-CONT chose-COMP$_{[F]}$ remember-COMP$_{[WH]}$
(i) 'Then, is **at least** wine such that **who** remembers whether Mary selected it?'
(ii) 'Then, **who** remembers whether Mary selected **at least** wine?'

We can also explain the interpretive restrictions here, making an appeal to the Max PSC combined with the LF E-agreement approach. First, as we have already seen in (14) in Section 2.2 above, a *WH*-P and an *F*P cannot synchronize their scope because that would require an illegitimate type of COMP [*WH*][*F*], which would involve redundancy of a focus property. This would disallow the *WH*-P and *F*P in both these examples to take synchronized matrix scope that leads to the interpretation in (27a-i) and (27b-i). What is

puzzling is why the *WH*-P and *F*P cannot involve E-agreement as in (28a-b) and take distinct scope as in (27a-ii) and (27b-ii).[16]

(28) a.



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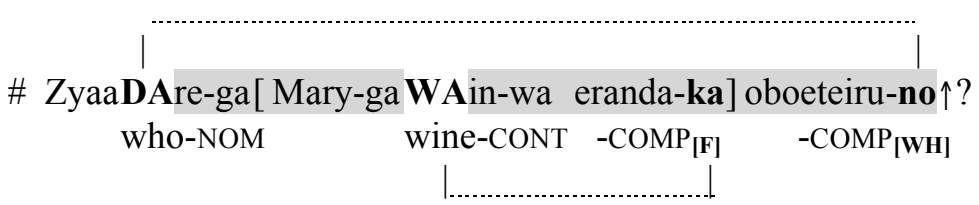
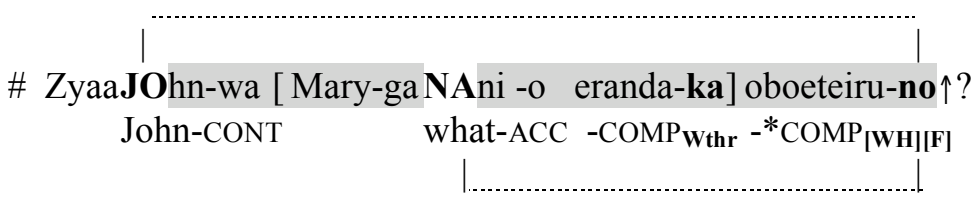


Here again, each E-agreement is legitimate and no other grammatical problem seems to arise, but the intended interpretation is not available. This interpretive restriction, however, can follow from the Max PSC since the prosodic information carried by (28a-b) is indistinguishable from that for *Global Compound* EPD, which we know will lead the perceivers to the parsing requiring an illegitimate type of COMP[*WH*][*F*] as in (29a-b).

(29) a.



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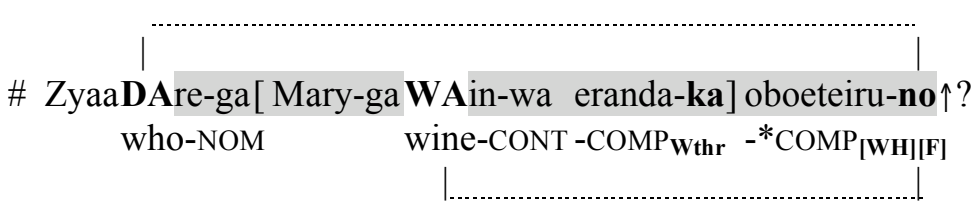
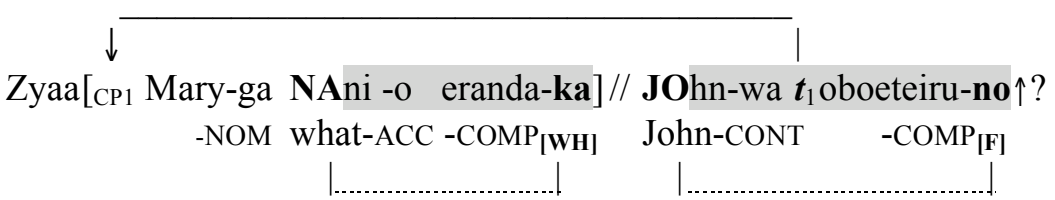


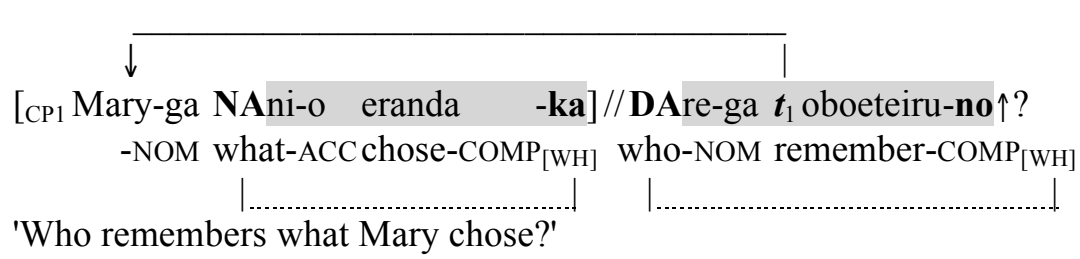
[16] Again, the matrix *WH*-P can never take subordinate scope, failing to be c-commanded by the subordinate COMP.

Quite interestingly, when we scramble the embedded CP over the matrix focus as in (30a), the sentence comes to permit distinct scope for each focused item, as pointed out to me by Satoshi Tomioka (personal communication). As shown in (30b), the unacceptable multiple *WH*-P construction in (25c) also becomes interpretable with distinct scope.

(30) a.



b



'Who remembers what Mary chose?'

One notable effect of scrambling here is that the emphatic accent of the matrix focus now comes to follow the embedded clause, which can be interpreted as a phonetic cue for the termination of the subordinate *Local* EPD, especially when a short pause is also added there. This prosodic pattern then can be interpreted as the phonetic realization of two distinct *Local* EPDs, one in the subordinate and the other in the matrix clause as indicated by // in (30a-b). This successfully leads to the distinct scope of the two focused items in these examples.[17] Since all the grammatical operations involved in (29a-b) and (30a-b) remain the same,

[17] Note that the same prosodic information in (30b) (without any pause) can be also regarded as the realization of *Global Compound* EPD for a matrix multiple Wh-question similar to (4b) above. This interpretation is indeed possible in (30b). Such an analysis, on the other hand, is not permitted in (30a) due to the illegitimacy of COMP[*WH*][*F*].

the contrast between the two cases strongly suggests that the interpretive restrictions observed in (29) does not originate in grammar and the solution appealing to processing as proposed here seems quite appropriate.

Finally, I would like to show how the proposed approach handles the same sentences when they are presented in writing without their prosody indicated, for instance, as in (31) (for (24) above).

(31) Dare-ga [Mary-ga nani-o eranda-ka] oboeteiru-no?
who-NOM -NOM what-ACC chose-COMPremember-COMP$_{[WH]}$
(i) '**WHO** remembers **what** Mary selected?'
(ii) '**WHO** remembers Mary selected **WHAT**?'

It might be thought that reading – especially silent reading – of a written example is immune to prosodic influences, but recent psycholinguistic findings suggest that this is not so. Sentence parsing data for languages as diverse as Croatian and Japanese are explicable in terms of the *Implicit Prosody Hypothesis* (IPH: Fodor (2002a), Fodor (2002b)), which explores the idea that prosody is always present in the processing of language, whether by ear or by eye.[18] In the E-agreement approach pursued in this paper, this amounts to the claim that even the silent reading of sentences are interpreted based upon E-agreement taking place both at PF and LF. I would like to point out here that the silent reading of (31) and other written sentences permits a different range of scope interpretations from the pronounced examples we have examined above, but that range is still controlled by prosody in a very subtle way. First, (31) in silent reading permits the second Wh-phrase *nani-o* 'what-ACC' to be interpreted

[18] IPH also pursues the hypothesis that a default prosodic contour is projected onto the stimulus in silent reading, which biases the parser toward the syntactic analysis associated with it. I will not discuss in this work the implication of this aspect of IPH to Wh-constructions in Japanese. See Kitagawa and Fodor (2003), Kitagawa and Fodor (2006) and Kitagawa (2005) for relevant discussion.

as a *wh*-P taking scope within the subordinate clause, just as in the way its pronounced version (32) is interpreted. This leads us to the interpretation (31-i).

(32)

DAre-ga [Mary-ga ***nani***-o eranda-***ka***] oboeteiru-***no***↑?
who-NOM what-ACC -COMP**[wh]** -COMP**[WH]**

'WHO remembers [***what*** Mary selected]?' (= (31-i))

In silent reading, we can also analyze both of the Wh-phrases in (31) as *WH*-Ps and interpret the sentence as a matrix multiple Wh-question, just as in the way its pronounced version (24) is interpreted. This leads us to the translation in (31-ii).

(24)

DAre-ga[Mary-ga **NA**ni-o eranda-**ka**] oboeteiru **-no**↑?
who-NOM -NOM what-ACC chose-COMP$_{Wthr}$ remember-COMP$_{[WH]}$

'WHO remembers Mary selected **WHAT**?' (= (31-ii))

It probably is true that the distinction of these two interpretations can be sensed in silent reading only when we succeed in mentally associating them with distinct prosodic patterns as in (32) and (24). The reader can try to distinguish the two interpretations while forcing themselves not to assign any such prosodic contours and see how difficult it is. One thing we cannot do in (31), however, is to interpret both of Wh-phrases as foci, i.e., as *WH*-Ps, and let them take distinct scope, just as in the way its pronounced version (25c) is to be interpreted.

(25) c.

DAre-ga [Mary-ga **NA**ni-o eranda **-ka**] oboeteiru **-no**↑?
who-NOM -NOM what-ACC chose-COMP$_{[WH]}$ remember-COMP$_{[WH]}$
'Who remembers what Mary chose?'

We can ascribe this interpretive restriction in silent reading to the Max PSC just as we did above if we assume that the parsing of (31) is controlled by implicit prosody even when it is not accompanied by any overt prosody.[19]

Let us now examine the silent reading of (33) (for (27a) above).

(33) Zyaa John-wa [Mary-ga nani-o eranda-ka] oboeteiru-no↑?
then -TOP/CONT -NOM what-ACC chose-COMP remember-COMP
(i) 'Then, **what**$_1$ is such that John remembers if Mary selected it$_1$?'
(ii) 'Then, does John remember **what** Mary selected?'
(iii)'Then, **what** does **at least** John remember Mary selected?'
(iv)'Then, does **at least** John remember **what** Mary selected?'

When no discourse or pragmatic contexts are provided, the silent reading of this sentence leaves room for *John-wa* in the matrix to be analyzed either as a topic phrase or a contrast phrase. When it is interpreted as a topic phrase, the Wh-phrase must be analyzed as a *WH*-P. This *WH*-P may take either matrix or subordinate scope yielding (33-i) or (33-ii), but the choice depends on which of *Global* EPD and *Local* EPD is assigned to it implicitly, as described in (34a-b).

(34) a.

ZyaaJohn-wa [Mary-ga **NA**ni -o eranda-ka] oboeteiru-**no**↑?
John-TOP what-ACC -COMP$_{\mathbf{Wthr}}$ -COMP$_{\mathbf{[WH]}}$
'Then, **what**$_1$ is such that John remembers if Mary selected it$_1$?' (= (33-i))

[19] The first Wh-phrase in (31) cannot be interpreted as an unfocused Wh-phrase, i.e., as a *wh*-P, due to the *wh*-P Theorem, as we pointed out in Section 3.1.

b. ZyaaJohn-wa [Mary-ga **NA**ni -o eranda-**ka**] o bo eteiru-no↑?
John-TOP what-ACC -COMP$_{\mathbf{[WH]}}$ -COMP$_{\mathbf{Y/N}}$
'Then, does John remember **what** Mary selected?' (= (33-ii))

Again, it would be rather difficult in silent reading to distinguish these two scope interpretations without implicitly assigning the distinct prosodic patterns.

When *John-wa* in (33) is analyzed as a contrast phrase, the sentence also permits both matrix and subordinate scope reading of the Wh-phrase as in (33-iii) and (33-iv), but the Wh-phrase must be demoted to a non-focus, i.e., to a *wh*-P, and assigned implicit prosody as in (35a-b).

(35) a.
ZyaaJOhn-wa [Mary-ga **nani** -o eranda-**ka**] oboeteiru-**no**↑?
John-CONT what-ACC -COMP$_{\mathbf{Wthr}}$ -COMP$_{\mathbf{[F][wh]}}$
'Then, **what** does **at least** John remember Mary selected?' (= (33-iii))

b.
ZyaaJOhn-wa [Mary-ga **nani** -o eranda-**ka**] oboeteiru-**no**↑?
John-CONT what-ACC -COMP$_{\mathbf{[wh]}}$ -COMP$_{\mathbf{[F]}}$
'Then, does **at least** John remember **what** Mary selected?' (= (33-iv))

Since prosody here, implicit or explicit, indicates only the scope of the *F*P, and *wh*-Ps in general are not accompanied by EPD, it is not an easy task to detect the two distinct scope readings of the *wh*-P arising from two distinct modes of E-agreement indicated here. The distinction, nonetheless, can be made when we can consider two distinct situations as follows. First, Mary is known to have selected two items — one item when Bill was with her and the other item when John was with her. After learning that Bill remembers what she selected when

he was with her, the speaker utters (35a), asking for the identity of the other item Mary selected when John was with her. This involves the matrix scope interpretation of the *wh*-P as in (33-iii). In a similar situation, after learning that Bill did not remember what Mary selected, the speaker utters (35b), asking whether John, unlike Bill, remembers what Mary selected. This involves the subordinate scope interpretation of the *wh*-P as in (33-iv). It seems that the direct Wh-question reading can be made more easily available by adding *-no hoo* 'as a choice' before *-wa* in (35a) and the indirect Wh-question reading can be forced by using *-nara* or *-dattara* 'if … is the choice' instead of *-wa* in (35b).

One thing we cannot do in the silent reading of (33), on the other hand, is to analyze *John-wa* as a contrast phrase and at the same time to interpret the Wh-phrase there as focused, i.e., as a *WH*-P, either with its matrix or subordinate scope. This interpretive restriction directly follows from our analyses above when we assume that prosody is implicitly assigned in silent reading, as *Global Compound* EPD as in (29a) and as co-occurrence of a *single Global* EPD and another *single Local* EPD as in (28a) repeated here.

(29) a.

Zyaa**JO**hn-wa [Mary-ga **NA**ni -o eranda-**ka**] oboeteiru-**no**↑?
John-CONT what-ACC -COMP$_{\textbf{Wthr}}$ -*COMP$_{\textbf{[WH][F]}}$

(28) a.

Zyaa**JO**hn-wa [Mary-ga **NA**ni -o eranda-**ka**] oboeteiru-**no**↑?
John-CONT what-ACC -COMP$_{\textbf{[WH]}}$ -COMP$_{\textbf{[F]}}$

As we argued above with the sentences involving overt prosody, E-agreement in (29a) would require an illegitimate COMP with the redundant feature

specification [*WH*][*F*], and the parsing as in (28a) would not be available due to the Max PSC. Both the information structural restrictions imposed by the *wh*-P Theorem and the processing restrictions imposed by the Max PSC, in other words, are observed even when the sentences are processed in silent reading.

4 Conclusions

In Sections 1 and 2, I sketched out a general research method incorporating prosodic and other extra-syntactic/extra-grammatical analyses into the formal study of syntax, and some details of its "elaborated" LF E-agreement approach. In Sections 3.1 and 3.2, I argued that certain representations permitted by grammar with the appropriate application of E-agreement may become unacceptable when some extra-grammatical problems arise. One such case involves an information structural problem, which we proposed to capture with the *wh*-P Theorem. Another case involves processing restrictions imposed by the specific prosodic pattern assigned to a sentence, whether or not the sentence is presented with overt prosody or is assigned implicit prosody by a parser when it is processed in silent reading. I argued that they can be captured by the Max PSC, a prosody-sensitive processing constraint.

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