

PROSODY, SYNTAX AND PRAGMATICS OF *WH*-QUESTIONS IN JAPANESE

YOSHIHISA KITAGAWA

Indiana University

It is well-known that the acceptability judgments reported on Subjacency and some related effects in Japanese are fuzzy, unstable and variable. I will attempt to demonstrate that we can bring back order to the chaos in this research area if we, first, pursue a syntactic analysis designed to simultaneously capture prosodic and semantic aspects of *Wh*-questions in Japanese, and second, appeal to extra-grammatical aspects such as pragmatics and processing to account for certain performance biases that hinder the straightforward reflection of grammar in language users' acceptability judgments on Subjacency examples. It is concluded that even the study of formal aspects of grammar must be conducted with much more careful attention to a larger context of language than is generally exercised.*

Keywords: *Wh-questions, Subjacency, prosody, pragmatics, processing*

1. Introduction

From its outset, generative grammar has been pursued with the working hypothesis that grammar functions as an autonomous mental organ

* The core of the research presented in this work has been developed in collaboration with Masanori Deguchi (on the grammatical derivation of prosody-scope correlation in *Wh*-questions), Janet Dean Fodor (on the interaction of prosody and processing as well as pragmatics and processing), and Satoshi Tomioka (on the semantics and pragmatics of *Wh*-questions). I am grateful to these and the following people—Leslie Gabriele for reading the entire manuscript and providing useful comments at the various stages of this work, and Haruo Kubozono for helping me understand some prosodic phenomena in Japanese. Discussion with Shinichiro Ishihara, Masako Hirotsu and S.-Y. Kuroda on the role of prosody in processing and production was also very useful. Janet Dean Fodor provided enormous help in writing up the summary of prosody-based processing in Croatian. The research in this work has been partially supported by COAS Grants-in-Aid and Faculty Research Incentive Fund at Indiana University.

and that language users' intuition on the grammaticality of linguistic expressions faithfully reflects the activity of this mental organ. In reality, however, this hypothesis becomes legitimate only when researchers succeed in distilling grammaticality judgments from the language users' acceptability judgments. In many occasions, this "idealization" approach of generative grammar has proven itself to be useful in elucidating core properties of syntax that do not seem to be attributable to any other cognitive faculty. In many other occasions, however, the same strategy with its somewhat distorted application may have created more confusion than clarification.

The issue is complex and delicate, but can be illustrated by a case study of Japanese syntax. For instance, many interesting and influential theoretical claims have been made in generative syntax based upon the scope interpretations of *Wh*-questions in Japanese, but the empirical facts presented in the literature have been sometimes unclear and confusing. Detection of a Subjacency effect in a sentence like (1) below reported in the literature presents a typical case. Note the ambivalent grammaticality judgment indicated on this example. (In glosses of this and other examples, I will indicate each distinct function of complementizers in Japanese as Comp_{Wh} (*Wh*-scope maker), Comp_{Whr} (a polar-question complementizer), $\text{Comp}_{\text{Y/N}}$ (yes/no question marker) or $\text{Comp}_{\text{That}}$ (declarative complementizer).)

- (1) (?)~??John-wa [Mary-ga nani-o katta-kadouka]
 -Top -Nom what-Acc bought- Comp_{Whr}
 shiritagatte-iru-no?
 want.to.know- Comp_{Wh}
 'What_i does John want to know [whether Mary bought t_i]?'
 (Watanabe (1992: 256-257, 263))

Through the examination of this and other topics involving *Wh*-questions in Japanese, I hope to show in this work that even the study of formal aspects of grammar should be conducted with much more careful attention to a larger context of language, such as prosody, processing and pragmatics, than is usually done, and that exercising such caution may be the key to bringing back order to the chaos in the field.¹ This article is organized as follows. In Section 2, I will first describe

¹ See also Schütze (1996) for highly relevant discussion.

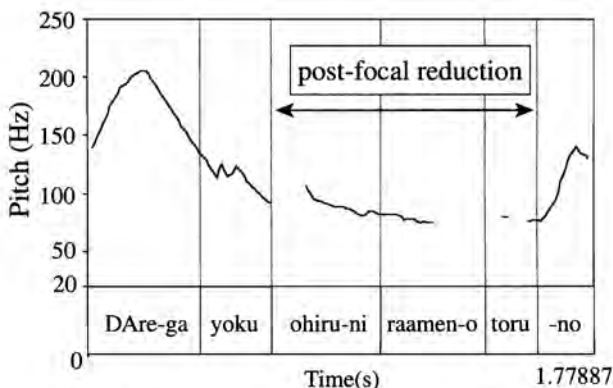
the prosody involved in Japanese *Wh*-questions in general, and then examine the close association holding between prosodic patterns and scope interpretations in this construction. In Section 3, Subjacency phenomena are reanalyzed with close attention paid to this prosody-scope association. In Section 4, a grammatical device to capture the correlation between prosody and *Wh*-scope will be offered. In Section 5, various extra-grammatical factors influencing language users' acceptability judgments are examined. Finally, in Section 6, we will discuss how variability in acceptability judgments should be or should not be treated in the study of generative grammar.

2. Prosody-scope Correlation in Japanese *Wh*-questions

In much of the past research on the syntax of Japanese (and other languages), syntacticians had an unfortunate tendency to either disregard or marginalize the prosody accompanying linguistic data. Deguchi and Kitagawa (2002) and Ishihara (2002), on the contrary, argued that it is essential to examine prosody in order to fully understand the scope interpretation of *Wh*-questions in Japanese. They pointed out that, at least in the Tokyo dialect, *Wh*-questions in Japanese must be generally accompanied by "Emphatic Prosody (EPD)" (or "Focus Intonation (FI)" in Ishihara's terminology) as indicated in (2).

- (2) a. **DA**re-ga yoku ohiru-ni ramen-o toru-no[↑]
 who-Nom often lunch-for ramen-Acc order-Comp_{Wh}
 'Who often has ramen noodles delivered for lunch?'

b.



EPD consists of, first, an *emphatic accent* on the *Wh*-focus, which con-

sists 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 ranges (indicated by shading). Note that *Wh*-words themselves generally carry prosodic prominence in *Wh*-questions in Japanese unlike, for example, in English. This is a typical prosodic property of *Wh*-in-situ languages in general, as Ladd (1996: 170–172) observes. Independently of EPD, *interrogative rise* intonation (indicated by \uparrow) is added at the end of an utterance in the matrix question, terminating post-focal reduction. (2b) is the pitch-track diagram of a recording of (2a).²

The same *Wh*-question sounds unnatural, on the other hand, when it is pronounced without EPD as in (3a), with the lexical accent of the head of each phrase merely retained (as indicated by a \odot circle). This non-emphatic prosody (accompanied by a phonological process of downstep (or catathesis)) is perfectly natural in a declarative sentence as in (3b), whose pitch-tracking is also indicated in (3c).³

(3) a. # \odot da-re-ga \odot ku o \odot ru-ni \odot men-o toru-no \uparrow

b. \odot hn-wa \odot ku o \odot ru-ni \odot men-o toru.

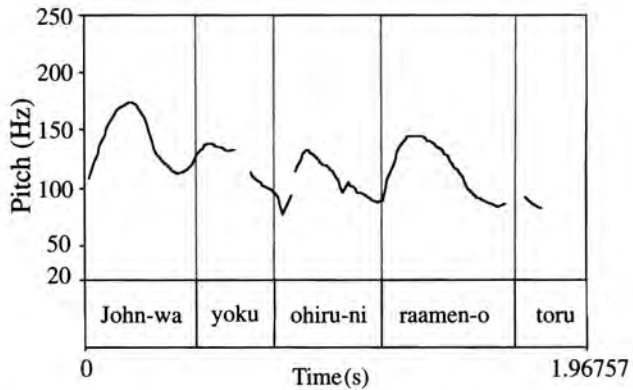
John-Top

'John often has ramen noodles delivered for lunch.'

² The range of pitch and intensity involved in the emphatic accent seems to vary depending on the degree of emphasis and apparently due to the speaker's personal traits as well (cf. Nishigauchi (1990: 34)). Every pitch-track diagram presented in this work was chosen from five to six similar diagrams of the author's own recordings. The utterances were recorded using the software Praat with sampling rate 22,050 Hz. Recordings of the EPDs for examples (2b), (3c), (4b), (5b), (18a–c) in this work can be listened to by visiting "<http://www.iub.edu/~ykling/SoundGallery/EL/index.html>". Although in this paper I use only lexically accented words to illustrate post-focal reduction and its termination, the H tones involved in the unaccented words also behave similarly in this context as long as the *Wh*-phrase is lexically accented. See also Ishihara's article in this volume and his homepage "http://www.sfb632.uni-potsdam.de/homes/s_i/" for more phonetic experiments on EPDs.

³ See also Maekawa (1991) for some phonetic experiments that support the claim that EPD is required for *Wh*-questions in Japanese.

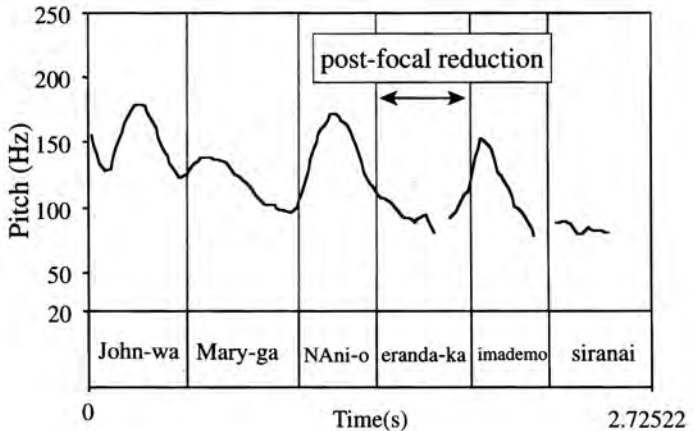
c.



Deguchi-Kitagawa and Ishihara then pointed out that the domain of EPD coincides with the scope domain of a *Wh*-question—the CP at which EPD ends corresponds to the scope domain of a *Wh*-phrase. Therefore, when a *Wh*-question is embedded and interpreted as an indirect *Wh*-question, it is most naturally accompanied by *Local EPD*, which ends at the subordinate Comp, as in (4).

- (4) a. John-wa [Mary-ga NAni-o eranda-ka]
 John-Top Mary-Nom what-Acc chose-Comp_{wh}
 ①mademo shiranai
 still does.not-know
 'John is yet to learn [what_i Mary chose t_i]?'

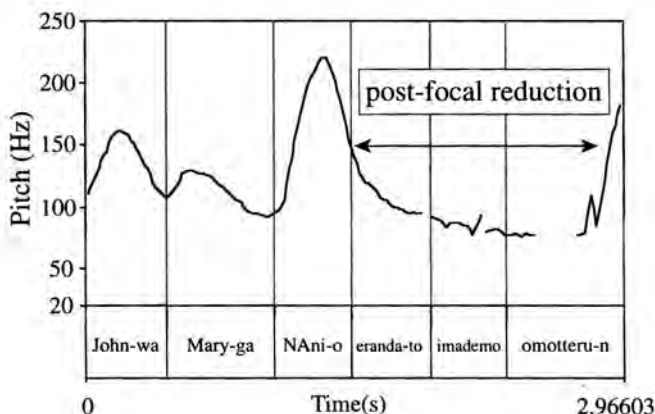
b.



Crucially, post-focal reduction in this sentence terminates at the subordinate Comp, as the retention of the H tone in (i)mademo ‘still’ in the matrix indicates. When the *Wh*-phrase in the subordinate clause is associated with the matrix Comp and the entire sentence is interpreted as a direct *Wh*-question, on the other hand, it is accompanied by *Global EPD* as in (5). Note that post-focal reduction continues up to the matrix Comp in this case.⁴

- (5) a. John-wa [Mary-ga NAni-o eranda-to] imademo
 John-Top Mary-Nom what-Acc chose-Comp_{That} still
 omoikonderu-no↑
 believe-Comp_{Wh}
 ‘What_i is such that John still believes [that Mary chose it_i]?’

b.



⁴ Hints of these observations can be found also in Tomioka (1997) on Japanese and Lee (1982) and Choe (1985) on Korean. Kubo (2001) also reports a similar but somewhat different prosody-scope correlation in *Wh*-questions in the Fukuoka dialect of Japanese. Kim (2002) conducted a small-scale production experiment and identified two pitch patterns Korean speakers use to distinguish different *Wh*-scope interpretations in the same way as Japanese use *Local* and *Global EPD*. Hirotani (2003) and Hirotani (2004), on the other hand, report that a sizable number of speakers in perception experiments could interpret *Wh*-questions accompanied by *Global EPD* as indirect questions. I will discuss this experiment in Section 5.2 below. *Local EPD*, *Global EPD* and *post-focal reduction* were also called *Short EPD*, *Long EPD*, and *eradication*, respectively, in Deguchi and Kitagawa (2002).

When a sentence can be ambiguously analyzed between a direct and indirect *Wh*-question as in (6) below, it can be disambiguated by the two distinct prosodic patterns—an indirect *Wh*-question accompanied by *Local EPD*, as in (6a), and a direct *Wh*-question accompanied by *Global EPD*, as in (6b).

- (6) a. Keisatsu-wa [kanojo-ga ano-ban
 police-Top she-Nom that-night
DAre-to atteita-ka] (i)mademo
 who-with seeing-Comp_{Wh} still
 shirabeteiru-no↑
 searching-Comp_{YN}
 ‘Are the police still investigating [who₁ she was with t₁
 that night]?’
- b. Keisatsu-wa [kanojo-ga ano-ban **DAre-to atteita-ka**]
-Comp_{Wh}
 imademo shirabeteiru -no↑
-Comp_{Wh}
 ‘Who₁ is such that the police are still investigating
 [whether she was with him₁ that night]?’

There is good reason to regard EPD as a prosodic phenomenon independent of echo questions. First, as in (4) above, *Local EPD* can be embedded in a declarative clause. Second, *Global EPD* can be assigned to a direct question that cannot be interpreted as an echo question. For instance, the questions in (5a) and (6b) above can be naturally preceded by a statement as in (7), which prohibits these sentences from being interpreted as echo questions.

- (7) Jaa chotto zenzen kankeinai koto-o tazuneru-kedo.
 then bit at.all unrelated matter-Acc ask-though
 ‘Then, let me ask you about a totally unrelated matter.’

As can be observed in examples like (6a, b), one characteristic of EPD is the prolonged monotony it creates with its *post-focal reduction*, yielding the phonetic marking of the scope domain of *Wh*-questions. Interestingly, distinct but abstractly similar monotonous prosodic patterns are assigned to the domain of “negative polarity” and “concession” expressed by an “indeterminate pronoun” *Wh* combined with *-mo* (Kuroda (To appear) and Tomioka (2004)), as in (8). (Overscores indicate prolonged high tones.)

- (8) a. sonna kantanna koto-o daREMO YAROU-TO
 such easy matter-Acc anyone will.do

SHINAkatta.

did.not

'No one was willing to do an easy thing like that.'

- b. Ano-ko-wa [_{CP} pro [_{CP} pro naNI-O
that-child-Top what-Acc

TABETAI-TO] OMOTTE]-mo

want.to.eat-CompThat think-even

kuchi-ni-wa-dasanai

does.not.mention

'Whatever that kid may want to eat, he will not mention it.'

EPD, in other words, seems to be one variation of a more general prosodic pattern.

It has been also brought to my attention that in the Kansai (western) dialects of Japanese, *Wh*-phrases are not lexically accented and any prosodic pattern corresponding to *Global EPD* does not seem to be permitted, at least not in any easy way, as alluded to by Nishigauchi (1990: 33, fn. 14). I am not aware of any published work to this date, however, in which the properties of *Wh*-questions in the Kansai dialects are systematically examined with their prosody properly controlled.⁵

3. Subjacency Revisited

After a long and winding history of investigation,⁶ it became increasingly popular in 1990s to take the stance that *Wh*-in-situ in Japanese does show Subjacency effects. It was reported, for instance, by Nishigauchi (1990) and Watanabe (1992) that a *Wh*-phrase located within a *Wh*-island as in (9) cannot take matrix scope. The judgment indicated on the example here is from the original source.

- (9) (?)~??John-wa [Mary-ga nani-o katta-kadouka]
-Top -Nom what-Acc bought-Comp_{whr}

⁵ As one anonymous reviewer alluded, what corresponds to *Local EPD* in the Kansai dialects is similar to a typical prosodic pattern of *Wh*-questions in languages like English, often exhibiting prominence on a predicate rather than a *Wh*-word.

⁶ See Kuno (1973), Choe (1984) and Pesetsky (1987), among others, for relevant observations and discussion.

shiritagatte-iru-no?

want.to.know-Comp_{Wh}

'What₁ does John want to know [whether Mary bought t₁]?' (Watanabe (1992: 256–257, 263))

The syntactic judgments reported on such examples, however, are notoriously and perhaps intolerably fuzzy and variable. They are usually accompanied by disclaimers that there is "a subtlety in the judgment" and its "degree of unacceptability varies among different speakers" (Watanabe (1992: 257, 262)).⁷

When we appeal to the prosody-scope correlation in *Wh*-questions observed above, however, we can now shed new light on this chaotic situation. First, let us assign *Local EPD* to the same sentence as in (10) below, in which the adjunct (i) *mademo* 'still' has been added in order to clearly mark the termination of the EPD at the end of the subordinate clause. The sentence now is clearly unacceptable; in fact, much more clearly so than usually reported. Throughout this article, I will use # to indicate that the sentence is unacceptable with the indicated prosody. It is essential therefore that the reader judge each sentence applying the prosodic pattern indicated there. (cf. Recordings at "http://www.iub.edu/~ykling/SoundGallery/EL/index.html".)

- (10) #John-wa [Mary-ga NAni-o katta-kadouka] (i)mademo
 what-Acc -Comp_{Whr} still
 shiritagatteiru-no↑
 -Comp_{Y/N}

'Does John still want to know [whether Mary bought what]?'

Given the prosody-scope correlation in *Wh*-questions, the acceptability judgment in (10) is in fact predicted. The *Local EPD* in this sentence indicates that the *Wh*-phrase *NAni-o* 'what-Acc' is being associated with the subordinate Comp *-kadouka* 'whether or not,' but for most speakers of Japanese, *-kadouka* cannot be associated with a *Wh*-phrase, and ungrammaticality arises.⁸ What is more striking is that when we assign *Global EPD* as in (11), the sentence becomes acceptable and inter-

⁷ Takahashi (1993: 657, fn. 3) even reports that a matrix *Wh*-scope interpretation in a sentence similar to (9) is straightforwardly possible.

⁸ There are some speakers who can interpret *-kadouka* as Comp_{Wh}, and for those speakers, (10) is acceptable as a yes/no question embedding an indirect *Wh*-question.

pretable as a direct *Wh*-question for most speakers.

- (11) John-wa [Mary-ga NAni-o katta-kadouka] imademo
 what-Acc -Comp_{wthr} still
 shiritagatteiru-no↑
 -Comp_{wh}

'What₁ is such that John still wants to know [whether Mary ate it₁]?''

Again, this prosody-scope correlation is exactly what is expected, and the availability of the matrix *Wh*-scope demonstrates that *Wh*-in-situ in Japanese does not show Subjacency effects. Most speakers also find that the matrix *Wh*-scope interpretation in question is much more easily available when the subordinate Comp *-kadouka* is replaced by *-ka*, as in (12), despite the fact that *-ka* here is also interpreted as 'whether.' Note that (12) involves a construction essentially identical to that in (6b) above.⁹

- (12) John-wa [Mary-ga NAni-o katta-ka] imademo
 what-Acc -Comp_{wthr} still
 shiritagatteiru-no↑
 -Comp_{wh}

'What₁ is such that John still wants to know [whether Mary ate it₁]?''

With prosody-sensitive syntactic analyses like these, Deguchi and Kitagawa (2002) pointed out that the ungrammaticality arising from the illegitimate association of a *Wh*-phrase and Comp_{wthr} (*-kadouka*) induced by *Local EPD*, as in (10), has been **misinterpreted in the literature as a Subjacency effect**.

When we pay close attention to the prosody in *Wh*-questions, we can

⁹ The judgment on each example accompanied by the indicated prosody has been confirmed by four to six speakers the author consulted and also by numerous speakers attending the author's lectures and presentations for the past four years or so. As will be presented in Section 6, the result of a wider scale experiment on perception conducted by Hirovani (2004) also generally confirms our judgments (though the result in her experiment on production does not—See Section 5.2 for discussion.) If the reader still detects any unnaturalness in examples like (11) and (12) with *Global EPD*, this could be due to other various extra-grammatical factors we will discuss in Sections 5.1 and 5.2. We will also investigate the contrast between *-kadouka* and *-ka* there. Nishigauchi (1990) regards *Global EPD* as a prosodic pattern that exceptionally repairs the Subjacency violation. We will take up and discuss this view in Section 6.

provide a new angle to look at still another grammatical phenomenon discussed in the literature concerning the paradigm in (13) (Watanabe (1992: 263)). The indicated acceptability judgments are from the original source, and are declared to have been adjusted to “the judgment of the relevant speakers” (p. 262).

- (13) a. John-wa [Mary-ga nani-o katta kadouka]
 John-Top Mary-Nom what-Acc bought Comp_{Wthr}
dare-ni tazuneta-no?
 who-Dat asked-Comp_{Wh}
 ‘What₁ is such that John asked *whom* [whether Mary bought it₁]?’
- b. ??John-wa [Mary-ga nani-o katta kadouka] *Tom-ni*
 what-Acc Comp_{Wthr} Tom-Dat
tazuneta-no?
 -Comp_{Wh}
 ‘What₁ is such that John asked *Tom* [whether Mary bought it₁]?’
- c. ??John-wa [*dare-ga* nani-o katta kadouka] *Tom-ni*
 who-Nom what-Acc Comp_{Wthr}
tazuneta-no?
 -Comp_{Wh}
 ‘*Who*₁ is such that John asked Tom [whether she₁ bought what]?’

First, it was reported that, in (13a), the Subjacency violation allegedly detected in (14) (= (1)/(9)) is obviated by introduction of an additional *Wh*-phrase in the matrix (*dare-ni* ‘who-Dat’).

- (14) (?)~??John-wa [Mary-ga nani-o katta-kadouka]
 -Top -Nom what-Acc bought-Comp_{Wthr}
shiritagatte-iru-no?
 want.to.know-Comp_{Wh}
 ‘What₁ is such that John wants to know [whether Mary bought it₁]?’

Second, when such an additional *Wh*-phrase in the matrix is replaced by a non-*Wh*-phrase (*Tom-ni* ‘Tom-Dat’) as in (13b), a Subjacency violation is reported to reappear. Finally, when an “additional” *Wh*-phrase (*dare-ga* ‘who-Nom’) is introduced within a *Wh*-island as in (13c), it allegedly fails to obviate the Subjacency effect. This set of contrasts reported on the paradigm in (13) is regarded as evidence for what is referred to in the literature as the “additional-*Wh* effect.”

Relevant to the investigation of this phenomenon is Deguchi and Kitagawa's (2002) observation 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.¹⁰ In (15a) below, for instance, *Compound EPD* ends at the subordinate Comp and both *Wh*-phrases must take subordinate scope, while in (15b, c), *Compound EPD* stretches to the matrix Comp and both *Wh*-phrases must take matrix scope. The two instances of EPD terminating at the identical Comp in *Compound EPD* is indicated by underscoring and an overscoring.

- (15) a. Keisatsu-wa [ano-ban DAre-ga
 police-TOP that-night who-Nom
DAre-to atteitta-ka] miN(̂a)-ni tazuneta-no↑
 who-with seeing-Comp_{wh} everyone-Dat asked-Comp_{YN}
 ‘Did the police ask everyone [*who* was with *whom* that night]?’
- b. Keisatsu-wa [ano-ban Mary-ga DAre-to
 police-TOP that-night Mary-Nom who-with
atteitta-ka] DAre-ni tazuneta-no↑
 seeing-Comp_{wthr} who-Dat asked-Comp_{wh}
 ‘*Who*₁ is such that the police asked [*whom* *whether* Mary was with *him*₁ that night]?’
- c. Keisatsu-wa [ano-ban DAre-ga DAre-to
 police-TOP that-night who-Nom who-with
atteitta-ka] kimi-ni tazuneta-no↑
 seeing-Comp_{wthr} you-Dat asked-Comp_{wh}
 ‘*Who*₁ is such that the police asked you [*whether* he₁ was with *whom* that night]?’

Note that the *Compound EPD* in (15a) is local while those in (15b, c) are global. Crucially, the two *Wh*-phrases in each of (15a-c) must be

¹⁰ Following the suggestion by S.-Y. Kuroda, I have renamed the “Complex EPD” of Deguchi and Kitagawa (2002) “Compound EPD,” since two EPDs here seem to function as one prosodic unit rather than as two independent units.

interpreted as a pair under the same clause. Thus, the sentence in (15a) is interpreted as a yes-no question embedding paired *Wh*-questions and answered, for example, as in (16a) below. (15b, c), on the other hand, are interpreted as paired matrix *Wh*-questions and the identity of both *Wh*-phrases must be provided in the answers, for example, as in (16b, c), respectively.

- (16) a. Un sou sou. miNNA-ni [DAre-ga DAre-to
yes so so everyone-Dat who-Nom who-with
atteitta-ka] tazunetandayo.
seeing-Comp_{Wh} asked
'Yes. That's right. They asked everyone [who was
with whom that night].'
- b. Kanojo-ga JOhn-to atteitta-ka(douka) BIlI-ni
she-Nom John-with seeing-Comp_{Wthr} Bill-Dat
tazuneta-rashii-desuyo.
asked-seems
'They seem to have asked Bill whether she (= Mary)
was with John.'
- c. MArY-ga JOhn-to atteitta-ka(douka)
Mary-Nom John-with seeing-Comp_{Wthr}
tazune-rareta-yo.
was.asked
'I was asked whether Mary was with John that night.'

On the contrary, when *Compound EPD* is not assigned to the sentence in (15b) and each *Wh*-phrase makes up its own *Local EPD* as in (17) below, no such pair-wise interpretation is available, and the sentence is interpreted as a direct *Wh*-question embedding an indirect *Wh*-question. Note that involvement of two separate instances of *Local EPD* in each clause is ensured in (17) by the retention of the (phrasal) H tones of the reordered matrix topic *keISATSU-WA* 'police-Top' intervening between them.¹¹

¹¹ The sentence in (15c) (with *-ka* used as the subordinate Comp_{Wh}) permits another distinct interpretation when it is accompanied by a single EPD as in (i).

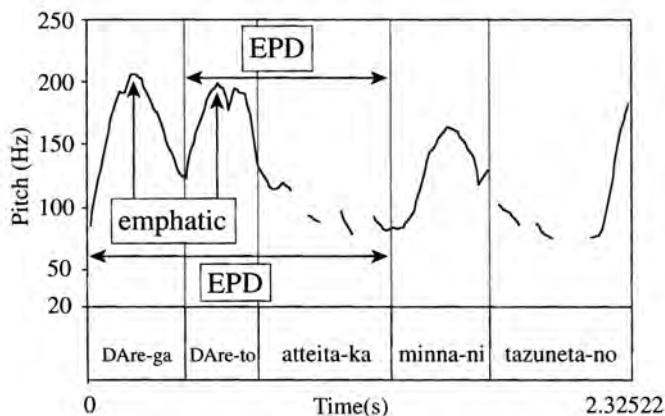
(i) Keisatsu-wa [ano-ban DAre-ga dare-to
police-TOP that-night who-Nom who-with
atteitta-ka] kimi-ni tazuneta-no↑
seeing-Comp_{Wh} you-Dat asked-Comp_{Wh}

'Who₁ is such that the police asked you [who₂ he₁ was with t₂]?'

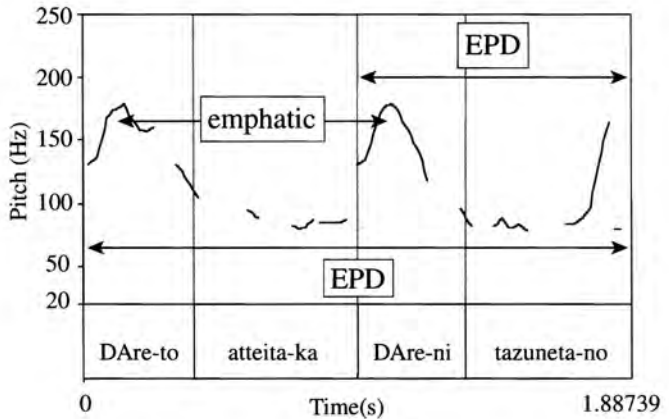
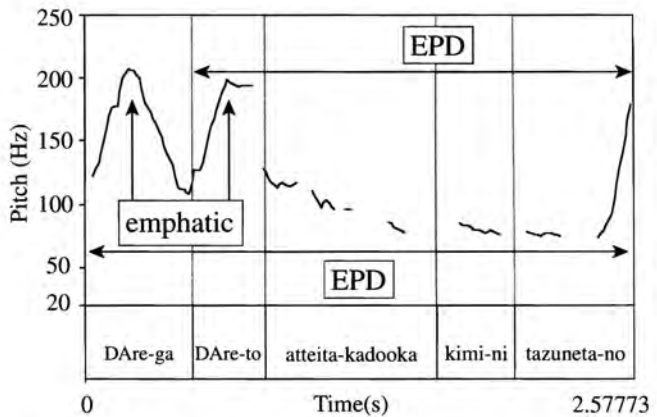
- (17) [ano-ban Mary-ga **DAre-to** atteitta-ka]
 that-night Mary-Nom who-with seeing-Comp_{Wh}
 keISATSU-WA **DAre-ni** tazuneta-no[↑]
 police-TOP who-Dat asked-Comp_{Wh}
 'Whom did the police ask [*whom*₁ Mary was with *t*₁ that night]?'

The pitch-track diagrams for the *Compound EPDs* in (15a-c) are shown in (18a-c), respectively. Notice the pairing of two distinct emphatic peaks of *Wh*-focus for two distinct EPDs, which terminate at the same Comp in each sentence. Again, the readers are urged to pronounce these prosodic patterns themselves. (cf. The recordings of (18a-c) at "<http://www.iub.edu/~ykling/SoundGallery/EL/index.html>".)

- (18) a. *Local Compound EPD* in (15a):



Here, the second *Wh*-phrase *dare-to* 'who-with' takes subordinate scope and is prosodically reduced within the post-focal reduction of the EPD starting from the first *Wh*-phrase *DAre-ga* 'who-Nom,' which takes matrix scope. The sentence, in other words, is not interpreted as a multiple *Wh*-question inducing synchronized scope. See Kitagawa (to appear) for the detailed analysis of this construction.

b. *Global Compound EPD in (15b):*c. *Global Compound EPD in (15c):*

Let us return here to the “additional-*Wh* effect” paradigm in (13), repeated below.

- (13) a. John-wa [Mary-ga nani-o katta kadouka]
 John-Top Mary-Nom what-Acc bought Comp_{Wthr}
dare-ni tazuneta-no?
 who-Dat asked-Comp_{Wh}
 ‘What₁ is such that John asked *whom* [whether Mary bought it₁]?’

- b. ??John-wa [Mary-ga nani-o katta kadouka] *Tom-ni*
 what-Acc Comp_{Wthr} Tom-Dat

tazuneta-no?

-Comp_{wh}

'What₁ is such that John asked Tom [whether Mary bought it₁]?'
 c.??John-wa [*dare-ga nani-o katta kadouka*] Tom-ni

who-Nom what-Acc Comp_{wh}_{thr}

tazuneta-no?

-Comp_{wh}

'Who₁ is such that John asked Tom [whether she₁ bought what]?'
 Note now that the sentence in (13a) is nothing but another instance of a multiple *Wh*-question comparable to (15b), and that the synchronized **matrix** scope of the two *Wh*-phrases, i.e. the "additional-*Wh* effect" in this sentence can be obtained **only when the sentence is accompanied by Global Compound EPD**, which stretches to the matrix Comp as in (19) below.

(19) John-wa [Mary-ga NAni-o katta-kadouka] DARE-ni
 what-Acc -Comp_{wh}_{thr} who-Dat

tazuneta-no↑

-Comp_{wh}

'What₁ is such that John asked whom [whether Mary bought it₁]?'
 Compare (19) with (20), in which two instances of EPDs are separated by the retained lexical accent of the intervening matrix topic (Jo)hn-wa 'John-Top.'

(20) [Mary-ga NAni-o katta-ka] (Jo)hn-wa DARE-ni
 what-Acc -Comp_{wh} John-Top who-Dat

tazuneta-no↑

-Comp_{wh}

'Whom did John ask [what₁ Mary bought t₁]?'
 (20) is interpretable only as a direct *Wh*-question embedding an indirect *Wh*-question (just as in (17) above). (The subordinate Comp in (19) has been changed from *-kadouka* 'whether or not' to *-ka* (Comp_{wh}) to make the resultant indirect *Wh*-question interpretation acceptable for most speakers.)

Now, crucially, even when both of the two *Wh*-phrases are located within the *Wh*-island, as in (13c), synchronized matrix *Wh*-scope becomes available **with a similar Global Compound EPD assigned to the sentence**, as in (21).

- (21) John-wa [DAre-ga NAni-o katta-kadouka] Tom-ni
 who-Nom what-Acc -Comp_{wth} Tom-Dat
tazuneta-no↑
 -Comp_{whs}

'Who₁ is such that John asked Tom [whether she₁ bought what]?'

The alleged Subjacency violation, in other words, does not arise even when the "additional *Wh*-phrase" is located within the *Wh*-island. Again, many speakers find the sentence to be more easily acceptable when the subordinate Comp *-kadouka* is replaced by *-ka* interpreted as 'whether,' as in (22).

- (22) John-wa [DAre-ga NAni-o katta-ka] Tom-ni
 who-Nom what-Acc -Comp_{wthr} Tom-Dat
tazuneta-no↑
 -Comp_{wh}

'Who₁ is such that John asked Tom [whether she₁ bought what]?'

Finally, as we have already confirmed above, a sentence like (13b) does not exhibit a Subjacency effect to begin with, and it is legitimately interpreted as a matrix *Wh*-question as long as it is accompanied by *Global EPD*, as in (23).

- (23) John-wa [Mary-ga NAni-o katta-kadouka] Tom-ni
 what-Acc -Comp_{wthr} Tom-Dat
tazuneta-no↑
 -Comp_{wh}

'What₁ is such that John asked Tom [whether Mary bought it₁]?'

In short, as long as the sentences in (13a-c) are accompanied by the required prosody, they do not yield a Subjacency violation, and this situation holds whether or not an "additional *Wh*-phrase" appears, regardless of where it may appear in the sentence. This suggests that the "additional-*Wh* effect" in Japanese is a pseudo-grammatical phenomenon. (But see Section 5.1 below for some prosodic and processing effects possibly induced by the addition of a *Wh*-phrase.)

With the observations above, I hope to have demonstrated that one of the main culprits which have obscured the empirical facts related to Subjacency in Japanese may be the lack of attention to the prosodic aspects of *Wh*-questions. (I will discuss other influential factors directly below.) Since acceptability judgments are often solicited using only written examples, there is a danger that informants unconsciously and

arbitrarily assign some specific prosodic pattern to a sentence, influencing their syntactic analysis. By neglecting prosodic factors, in other words, a researcher runs the risk of conducting a syntactic test that is not repeatable. I believe that such lack of repeatability of syntactic tests plays a significant role in the variation as well as the instability of native speaker intuitions on the Subjacency effect in Japanese.

4. Synchronization of LF-computation and PF-computation

One question we need to answer is how the prosody-scope correlation in *Wh*-questions arises in Japanese. When we take the position that the output of generative grammar provides instructions for linguistic performance, there is no room for language users to directly associate sounds and meanings, and hence no way for them to arrive at *Wh*-scope interpretations directly from EPDs, or vice versa. Instead, we should consider that there must be a piece of knowledge in our brain, in our grammar more specifically, which eventually permits our performance systems to achieve synchronized effects of sounds (EPDs) and meanings (*Wh*-scope interpretations) when we produce or perceive *Wh*-questions in Japanese.

We can pursue this idea by extending Chomsky's (2000) computational operation "Agree" along the line of the "E-agreement" analysis originally proposed by Deguchi and Kitagawa (2002).¹² A remodeled version of this analysis now postulates what is called an "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 one 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

¹² I would like to acknowledge here that it is Masanori Deguchi who first suggested an analysis of EPD along the line of Chomsky's checking theory.

get deleted.¹³ 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.¹⁴

The two different cases of prosody-scope correlation observed in a “*Wh*-in-situ” sentence 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 (24) and (25), respectively.

- (24) a. LF: [_{CP} John-wa [_{CP} Mary-ga

Subordinate Scope

nani[E_{SEM}]-o tabeta]-ka[E_{SEM}] shirabeteiru-no]
 what-Acc -Comp_{Wh}

- b. PF: [_{CP} John-wa [_{CP} Mary-ga

NA_ni[E_{PHON}]-o tabeta-ka[E_{PHON}] shi(r@beteiru-no) ↑]

Local EPD

- (25) a. LF: [_{CP} John-wa [_{CP} Mary-ga

Matrix Scope

nani[E_{SEM}]-o tabeta-ka] shirabeteiru-no[E_{SEM}]]
 what-Acc -Comp_{Wh}

¹³ 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).

¹⁴ In this approach, the E-agreement need not be translated into any hierarchical phonological phrasing which mediates syntax and the phonetic interpretation of EPD. See Pierrehumbert and Beckman (1988), Nagahara (1994), Truckenbrodt (1995), Sugahara (2003) and Ishihara (2003), among others, for relevant discussion.

- b. PF: [_{CP} John-wa [_{CP} Mary-ga
 NAni[_{E_{PHON}}]-o tabeta-ka] shirabeteiru-no[_{E_{PHON}}]] ↑

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 correspondence between the domain of *Wh*-scope and EPD.¹⁵ Since an E-feature complex can be introduced either under the subordinate Comp or the matrix Comp in an embedded construction, both combinations of *Wh*-scope and EPD in (24) and (25) are equally available in principle in any such ambiguous constructions. In some cases, however, certain influential extra-syntactic/extra-grammatical factors may intervene and induce a preference relation between these two combinations, and sometimes even break the correspondence between *Wh*-scope and EPD when *Wh*-questions are actually produced or perceived by language users. I will take up and discuss such phenomena in the next section.

5. Explaining Performance Biases

I have pointed out above that the chaos and confusion involved in the grammaticality judgments of Subjacency effects as in (1) (repeated below) can be resolved when we pay close attention to the prosody of this sentence.

- (1) (?)~??John-wa [Mary-ga nani-o katta-kadouka]
 -Top -Nom what-Acc bought-Comp_{whr}
 shiritagatte-iru-no?
 want.to.know-Comp_{wh}
 'What₁ is such that John wants to know [whether Mary bought it₁]?'

We can in fact take our research to the next level by addressing an empirical issue as follows. The Subjacency effect reported for (1) in the literature obviously reflects the fact that speakers often prefer the

¹⁵ The E-agreement analysis is further developed and argued for by Kitagawa (to appear), in which the semantic E-feature (E_{SEM}) itself is further analyzed as being complex and heterogeneous in nature and capable of being associated with any focused *Wh*-phrases, unfocused *Wh*-phrases or non-*Wh* focus phrases when it consists of a distinct combination of semantic features.

subordinate *Wh*-scope interpretation induced by *Local EPD* as in (10) (repeated below), overlooking the matrix *Wh*-scope interpretation induced by *Global EPD*, as in (11).

- (10) #John-wa [Mary-ga NAni-o katta-kadouka] ①mademo
 what-Acc -Comp_{wthr} still
 shiritagatteiru-no↑
 -Comp_{Y/N}

'Does John still want to know [whether Mary bought what]?'*

- (11) John-wa [Mary-ga NAni-o katta-kadouka] imademo
 what-Acc -Comp_{wthr} still
 shiritagatteiru-no↑
 -Comp_{wh}

'What₁ is such that John still wants to know [whether Mary ate it₁]?'*

How does this subordinate scope preference arise? I will attempt to show in this section that it is caused by certain biases imposed on the perception and production of sentences by extra-grammatical factors like processing and pragmatics.

5.1. Influence of Prosody-induced Processing

Given the prosody-scope correlation observed above, we can approach the mystery of subordinate scope preference from a different angle and ask the following questions. First, why do language users tend to assign *Local EPD* rather than *Global EPD* to a sentence like (1) while both of these prosodic patterns are possible? Second, since the Subjacency effect can be eliminated when the sentence is presented to informants with *Global EPD* as in (11), the language users' tendency to assign *Local EPD* seems to arise mostly when the sentence is presented in writing. How does this asymmetry between perception through listening and writing arise?

We can provide answers to these questions by appealing to the notion of a processing bias induced by prosody, as discussed in Kitagawa and Fodor (2003). Consider first what actual activities must be involved when a language user attempts to provide acceptability judgments to a sentence. When a sentence is uttered, the listener must first perceive a sequence of sound waves that is conveyed by air molecules, then must recognize what individual lexical items are involved and what syntactic constituents said lexical items make up by way of parsing. The sound waves here include the information on the individual sound units mak-

ing up each lexical item, the phonetic effects arising from their phonological changes as well as the prosody assigned to some larger syntactic constituent, such as intonation. Since the sound waves in question have been produced by human beings, they are necessarily subject to the influence of the physical and physiological limitations of our articulatory and respiratory organs. The situation is even more complicated when a language user attempts to provide acceptability judgments to a sentence presented in writing. First, when the reader tries to understand the sentence by reciting the sentence, she would have to assign sounds on her own since the written sentence merely presents a sequence of words. Under such circumstances, especially when the reader is attempting to identify the syntactic structure involved in the sentence, it is quite natural for her to pronounce it together with a prosodic pattern such as intonation. What this means is that when we attempt to provide an acceptability judgment of a written sentence, we must not only process the sentence but also produce it.

One may think that no such complication arises when we check the acceptability of a written sentence without reading it aloud. Evidence is growing, however, that we do actually assign some specific prosodic pattern to a sentence in our mind even when we process it by way of silent reading, i.e. even when we do not actually pronounce it aloud. This conclusion is based upon the examination of various linguistic phenomena in several different languages by Bader (1998), Fodor (1998), Fodor (2002), Hirose (1999), Lovrič (2003) and others. Fodor (2002) formulated the "Implicit Prosody Hypothesis," which maintains that when more than one prosodic pattern can be assigned to a sentence, the "implicit prosody" that is mentally projected by a reader tends to reflect the default prosodic pattern for that construction and may influence the way the reader parses the sentence.

For example, Lovrič (2003: Chs. 5–6) observed a processing bias in Croatian which seems to be induced by default prosody in silent reading. To understand this, let us consider first the facts of overt prosody in spoken Croatian, and its relation to syntactic structure. A sentence such as (26) is structurally ambiguous, since the relative clause may modify either of the nominal projections that precede it: either the lower one (*odvjetnice*, 'lawyer,') as indicated in (26a), or the higher nominal projection which contains the lower one (*klijenticu (od) odvjetnice*, 'client of the lawyer'), as shown in (26b).

- (26) a. Nazvali smo klijenticu (od) [[odvjetnice] što puši
 phoned are client (of) lawyer[Gen] that smokes
 paket cigareta dnevno]
 pack cigarettes daily
 'We phoned the client of a lawyer; the lawyer smokes a
 pack of cigarettes a day.'
- b. Nazvali smo [[klijenticu (od) odvjetnice] što puši
 phoned are client (of) lawyer[Gen] that smokes
 paket cigareta dnevno]
 pack cigarettes daily
 'We phoned the client of a lawyer; the client smokes a
 pack of cigarettes a day.'

This ambiguity in Croatian (like comparable ambiguities in English and other languages) is open to prosodic influence. A phonological boundary between two prosodic phrases tends to be aligned with a division between phrases in the syntactic structure (Selkirk (2000)).¹⁶ Thus, a speaker who wishes to convey the meaning in (26a) will most likely not make a prosodic break between the lower noun *odvjetnice* and the relative clause, while a speaker who wishes to express the meaning in (26b) is likely to produce a prosodic break there in order to signal to the hearer to avoid attaching the relative clause locally to that noun. Experiments have shown that listeners are sensitive to this prosodic difference. Lovrič found that when Croatian listeners hear a potentially ambiguous sentence like those in (26), their choice of an attachment site for the relative clause is strongly influenced by the prosodic contour with which the sentence is spoken. Prosodic continuity between the lower noun *odvjetnice* and the relative clause encouraged local attachment of the relative clause as in (26a), while a prosodic break between that noun and the relative clause led hearers to choose the structurally more distant relative clause attachment to the higher nominal projection headed by *klijenticu*.

¹⁶ A phonological boundary may be acoustically realized in several ways. A pause is possible but not obligatory. In many languages, perhaps universally, there is lengthening of the syllable(s) immediately preceding the boundary. Also common is the reset of the fundamental frequency, with details that are language-dependent. In a language with high end-tones (like French) a reset would be from high to low, while in a language with low end-tones (as in most contexts in English) a reset is from low to high.

It now becomes possible to understand the choices that Croatian readers make as they interpret sentences that are presented visually with no prosodic cues at all. The distribution of prosodic boundaries in speech is sensitive not only to syntactic tree structure but also to other factors. One such factor is constituent length. There is a certain optimum length for a prosodic phrase, and a sentence is divided up, if possible, in such a way that none of its prosodic phrases is much longer or much shorter than the optimum. In particular, a single phonological word is uncomfortably short as a prosodic phrase. Therefore a very short relative clause, as in (27), will optimally be absorbed into the same prosodic phrase as the words that precede it.

- (27) Nazvali smo klijenticu (od) odvjetnice što puši.
 phoned are client (of) lawyer[Gen] that smokes
 'We phoned the client of a lawyer; the lawyer smokes.'

This results in a contour with no prosodic break before the relative clause, thus favoring low attachment of the relative clause to *odvjetnice*. By contrast, a longer relative clause, as in (26a, b) above, is more amenable to separate prosodic phrasing, and thus is more likely to be attached high in the syntactic structure, to modify *klijenticu (od) odvjetnice*.

Another factor relevant to the position of prosodic breaks is the category of the syntactic constituent with which the break is aligned. The preposition *od* 'of' between the two nouns is optional in Croatian. Lovrič found a high proportion of prosodic breaks at the PP boundary before *od odvjetnice* when the preposition was present, but fewer prosodic breaks at the DP boundary before *odvjetnice* when the preposition was absent. Also, a prosodic break at the PP boundary tended to suppress a break at the beginning of the relative clause (presumably because the intervening material, consisting of just *od odvjetnice*, would have been too short to constitute an optimal prosodic phrase). Thus, the version of the construction with the preposition *od* between the nouns would be expected to favor low attachment of the relative clause, while the version without *od* would be more likely to favor high attachment.

Remarkably, Lovrič found that both of these factors (relative clause length, presence or absence of preposition) had a significant effect not only on prosodic breaks in spoken sentences but also on sentence interpretation in silent reading. Readers were more likely to attach a short relative clause to the lower (local) nominal projection than they were

for a long relative clause, and they were more likely to do so when the preposition was present than for the prepositionless version. These findings are quite mysterious if reading is thought of entirely in terms of visual processing. But in terms of implicit prosody it is exactly as would be expected. The preferred interpretations in silent reading paralleled the preferences of subjects hearing comparable sentences pronounced aloud with their optimal prosodic contours.

Thus, the otherwise mysterious effects of constituent length and PP boundaries in silent reading are explicable on the assumption that readers project onto a sentence its most natural (default) prosody. More generally: the evidence indicates that even in silent reading a sentence has a prosodic contour, though the properties of that contour are determined by the *perceiver* rather than by the producer. This forces us to draw a somewhat surprising conclusion: Even when we try to free acceptability judgments from factors other than 'pure' syntax and semantics, we cannot do so. When we ask consultants to give acceptability judgments on a written example, they are likely to judge it as if it had been spoken with the default prosody. Therefore, if that example happens to be a sentence which requires a non-default prosody, it is quite likely to be rejected as unacceptable/ungrammatical. It follows that even if the grammar is modular, we cannot obtain modular judgments. The data we obtain from syntactic acceptability judgments on written sentences cannot escape the influences of prosody and processing, even if our consultants read them completely silently.

The Implicit Prosody Hypothesis also provides us with a clue to solving the puzzle of the subordinate scope preference in the Subjacency construction when and only when the sentence is perceived in silent reading. That is, if *Local EPD* rather than *Global EPD* can be identified as the default prosodic pattern of *Wh*-questions in Tokyo Japanese, we can reduce the subordinate scope preference to the processing bias caused by the implicit prosody assigned in the silent reading. This indeed seems to be possible when we pay attention to the phonetic characteristic of EPD, taking into consideration a general phonological constraint discussed in the literature. In his work, Kubozono (1993: 51, 59) discusses a possible universal nature of an abstract principle proposed by Selkirk (1984: 248-249), which "has the effect of converting otherwise monotonous patterns into alternating and, in that sense, more rhythmic ones." This general and abstract principle was argued to provide an explanation for otherwise puzzling phonetic phenomena such as

stress-split in English compounds, accent-split in Japanese compounds and extra F_0 boost in Japanese, all of which have the effect of breaking up a monotonous prosodic pattern. For instance, accent-split in Japanese can be illustrated by the contrast between (28)–(29) and (30) below. First, Japanese compounds consisting of two or three elements generally receive their accent on the antepenultimate more in accordance with the Compound Accent Rule, as in (28) and (29).

- (28) a. sha'kai + se'ido → shakai-se'ido
 society system social.system
- b. songai + hoshoo → songai-ho'shoo
 damage compensation damage.compensation
- (29) a. [[tounan a'jia] sho'koku] → tounan-ajia-sho'koku
 south.east Asia nations
- b. [[san koutai] ki'nmu] → san-koutai-kin'mu
 three shift work

On the other hand, when a compound gets longer with four elements, involving a uniformly left-branching structure as in (30) below, the accent pattern in (ii) suddenly becomes available in addition to the regular accentual pattern in (i).

- (30) a. [[[tounan a'jia] sho'koku] rengou]
 south.east Asia nations union
- (i) tounan-ajia-shokoku-re'ngou
- (ii) tounan-a'jia-shokoku-re'ngou
- b. [[[san koutai] ki'nmu] se'ido]
 three shift work system
- (i) san-koutai-kinmu-se'ido
- (ii) san-ko'utai-kinmu-se'ido

Note that the additional accentual pattern in (ii) has the effect of breaking the prolonged stretch of monotony in the middle of the compound arising in the regular accentual pattern in (i). Kubozono points out that a general tendency of human speech to avoid monotony is only a specific case of a more general principle of human cognition such that "the human mind tends to seek in every kind of motor action a rhythmic pattern, or a pattern characterized by an ordered alternation of contrast-

ing elements" (p. 59), as often discussed in the psychology literature. Thus, it is reasonable to consider that there is a universal tendency to avoid monotonous prosody, which we can refer to as "Avoid Monotony."

Now, recall that one of the prosodic characteristics of EPD is that its *post-focal reduction* has the tendency to prolong a monotonous tonal pattern by compressing all H tones appearing in its domain. We can therefore quite naturally consider that *Local EPD* as in (10) (repeated below again) will be regarded as the default prosodic pattern of *Wh*-questions as opposed to the *Global EPD* as in (11). Because of its prolonged post-focal reduction, *Global EPD* tends to create a long monotonous flow of low tones, which offends *Avoid Monotony*. Assignment of *Global EPD*, in other words, requires extra effort on the part of language users even if it is permitted by the grammar.

- (10) #John-wa [Mary-ga **NAni-o katta-kadouka**] ①mademo
 what-Acc -Comp_{wthr} still
 shiritagatteiru-no↑
 -Comp_{Y/N}
 'Does John still want to know [whether Mary bought what]?'
 (11) John-wa [Mary-ga **NAni-o katta-kadouka**] imademo
 what-Acc -Comp_{wthr} still
 shiritagatteiru-no↑
 -Comp_{wh}
 'What₁ is such that John still wants to know [whether Mary ate it₁]?'
 This account of the subordinate scope preference is additionally supported when we observe that even *Local EPD* becomes increasingly unacceptable when the post-focal reduction gets longer. Note that it becomes gradually more difficult to maintain post-focal reduction as we proceed through (31a-d).

- (31) a. John-wa [Mary-ga **NAni-o tabeta-ka**] ①mademo
 John-Top Mary-Nom what-Acc ate-Comp_{wh} still
 shiritagatteiru
 want.to.know
 'John still wants to know [what₁ Mary ate t₁].'
 b. John-wa [Mary-ga **NAni-o shikago-no**]
 what-Acc Chicago-Gen

furenchi-resutoran-de tabeta-ka]

French-restaurant-at ate-Comp_{wh}

①mademo shiritagatteiru]

'John still wants to know [what_{t1} Mary ate *t1* at a French restaurant in Chicago].'

- c. ?#John-wa [Mary-ga NAni-o shikago-no
what-Acc Chicago-Gen

furenchi-resutoran-de mawari-no-hito-ni

French-restaurant-at surrounding.people-by

tomerareru-made tabeta-ka] ①mademo shiritagatteiru]

stopped-until ate-Comp_{wh}

'John still wants to know [what_{t1} Mary ate *t1* at the French restaurant in Chicago until she was stopped by the people on the scene].'

- d. #John-wa [Mary-ga NAni-o shikago-no
what-Acc Chicago-Gen

furenchi-resutoran-de mawari-no-hito-ni

French-restaurant-at surrounding.people-by

tomerareru-made onaka-ippai tabeta-ka] ①mademo

stopped-until full ate-Comp_{wh}

shiritagatteiru]

'John still wants to know [what_{t1} Mary ate *t1* at the French restaurant in Chicago until she became completely full and was stopped by the people on the scene].'

On the other hand, when we eliminate a *Wh*-phrase from (31d), as in (32) below, replacing *Nani-o* 'what-Acc' with *foAGURA-O* 'foie gras-Acc,' no EPD is assigned and all H tones, lexical or non-lexical, are maintained. (32) is still as long as (31d), but no great difficulty arises when we read it aloud with the indicated prosody. (H tones of non-lexically accented items are indicated by capital letters.)

- (32) John-wa [Mary-ga foAGURA-O (sh)kago-no
Mary-Nom foie.gras-Acc Chicago-Gen
fuRENCHI-(re)sutoran-de maWARI-NO-HI(to)-ni
French-restaurant-at surrounding.people-by
toMERARERU-(made) oNAKA-IPPAI (ta)beta-koto]-o
stopped-until full ate-fact-Acc
①mademo shiranai]
still do.not.know

'John is yet to know the fact that Mary ate foie gras at the French restaurant in Chicago until she became completely full and was stopped by the people on the scene.'

This suggests that the problem in (31c, d) is purely prosodic in nature.¹⁷

Recall here the additional-*Wh* effect reported in the literature on (13) (repeated below with the judgments from the original source).

- (13) a. John-wa [Mary-ga NAni-o katta-kadouka]
 John-Top Mary-Nom what-Acc bought-Comp_{Wthr}
DAre-ni tazuneta-no↑?
 who-Dat asked-Comp_{Wh}

'What₁ is such that John asked *whom* [whether Mary bought it₁]?'

- b. ??John-wa [Mary-ga NAni-o katta-kadouka] Tom-ni
 what-Acc -Comp_{Wthr} Tom-Dat
tazuneta-no↑?

-Comp_{Wh}

'What₁ is such that John asked *Tom* [whether Mary bought it₁]?'

- c. ??John-wa [DAre-ga NAni-o katta-kadouka]
 who-Nom what-Acc -Comp_{Wthr}
Tom-ni tazuneta-no↑?
 -Comp_{Wh}

'Who₁ is such that John asked Tom [whether she₁ bought what]?'

We pointed out in Section 3 above that the additional-*Wh* effect cannot be regarded as a grammatical phenomenon. It was shown that *Global Compound EPD* is required in (13a) to provide a synchronized matrix *Wh*-scope interpretation for a multiple *Wh*-question, and the same prosodic pattern also permits (13c) to provide synchronized matrix *Wh*-

¹⁷ A countermeasure that speakers can adopt to avoid such a prosodic problem in (31c, d) is to halt the reduction of some accent in the middle of the *post-focal reduction*, while letting the reduction resume after that and continue up to the appropriate COMP. The sentence in (31c), for example, can be read as in (i) with the accent on *maWARI-NO-HI*(o)-*ni* 'surrounding.people-by' retained.

(i) John-wa [Mary-ga NAni-o shikago-no furenchi-resutoran-de maWARI-NO-HI(o)-*ni* *tomerareru-made tabeta-ka*] (i)*mademo shiritagatteiru*]

scope **when the sentences are read aloud**. We can again take a step further here and raise an empirical question as follows. The fact that the additional-*Wh* effect was reported on (13a) but not on (13c) in the literature suggests that there is a tendency for speakers to be reluctant to assign *Global Compound EPD* in (13c) **in their silent reading** while such is not the case in (13a). How does this asymmetry arise? Our "Avoid Monotony" approach to the account of subordinate scope preference in the regular Subjacency cases (as in (13b)) may provide an answer to this question. Note that the assignment of *Global Compound EPD* in (13a) quite effectively breaks the prolonged monotony starting from the subordinate *Wh*-focus *NA**ni-o* 'what-Acc' at the matrix *Wh*-focus *DA**re-ni* 'who-Dat.' In (13c), on the other hand, *Global Compound EPD* would still leave post-focal reduction somewhat extensively prolonged. In this way, we can explain how the intuition reported as the additional-*Wh* effect in Japanese may arise in some speakers.¹⁸

To sum up this section so far, preference for subordinate *Wh*-scope in the Subjacency construction ((10) vs. (11)) as well as preference for the "matrix" additional-*Wh* effect ((13a) vs. (13c)) can be accounted for by "Avoid Monotony-as a general" constraint imposed on prosody. Both of these "pseudo-grammatical" phenomena, in other words, can be reduced to the processing biases which arise when perceivers unconsciously and implicitly assign a default prosodic pattern to the sentences in their silent reading.

One last thing I would like to take up in this section is the role of default prosody in actual pronunciation. If *Local EPD* is indeed the default prosodic pattern in *Wh*-questions in Tokyo Japanese, it is highly likely that readers tend to assign it to a written sentence even when

¹⁸ Under this prosodic account of the additional-*Wh* effect, we also predict that those who detect awkwardness in (13b, c) should also find (i) below equally awkward despite the addition of a matrix *Wh*-phrase.

- (i) John-wa *DA**re-ni* [*Mary-ga NA**ni-o* katta-kadouka] tazuneta-no↑?
 John-Top who-Dat Mary-Nom what-Acc bought-Comp_{whr} asked-Comp_{wh}
 'What_i is such that John asked *whom* [whether Mary bought it_i]?'

This indeed seems to be the case (e.g. Watanabe (1992: 271)). Note that the addition of *DA**re-ni* 'who-Dat' in (i) is rather ineffective in breaking the prolongation of monotony.

they attempt to read it aloud. At least with respect to the initial round of processing, in which readers are yet to figure out the syntax, semantics and pragmatics involved in the sentence, this is quite likely to happen.¹⁹ If so, we may find another cause for language users' bias toward the subordinate scope preference (and hence Subjacency effect) when they are asked to provide an acceptability judgment. Suppose that the researcher running a syntactic test is not paying enough attention to the prosody of *Wh*-questions. If this researcher presented the example sentences to the informants in writing, *Local EPD* as a default prosodic pattern tends to be assigned by the informants at least in the initial round of processing and the subordinate scope preference is expected to arise. Note now that this should be the case whether they read the sentence silently or aloud. What will happen if the researcher presents example sentences orally but without providing careful control of prosody? Under such circumstances, it is quite possible that this researcher tends to assign *Local EPD* to the sentences as a default prosodic pattern, thereby unconsciously urging the informants to seek the subordinate *Wh*-scope interpretation. Since, as we saw above, listeners actually can obtain the matrix *Wh*-scope interpretation when *Global EPD* is properly assigned to the sentence, another biasing factor like this certainly exists as a possibility.²⁰

¹⁹ This may not necessarily be the case when matrix *Wh*-scope is strongly implied by the discourse and/or the semantics and pragmatics of the sentence at the early stage of processing. We will discuss such biasing factors shortly in Section 5.2 below. Hirotani (2003: Ch. 2) reports that, in her **production** experiment, about half of her subjects assigned what corresponds to *Local EPD* even to complex sentences that are interpretable only as matrix *Wh*-questions. Note that this result fully complies with our hypothesis here.

²⁰ Kitagawa and Fodor (2003) also point out that a general processing constraint as in (i) below can be another factor to bias the perceivers in favor of the subordinate scope of a subordinate *Wh*-in-situ as in (10). ((i) is an approximate reproduction of the unnamed constraint suggested by Miyamoto and Takahashi (2002: Section 6).)

- (i) Minimize Dependencies in processing:

Resolve all dependencies as soon as possible (perhaps to reduce strain on working memory).

Note that (i) encourages the *Wh*-phrase located in the subordinate clause to be associated with the subordinate Comp_{Wh} rather than the matrix Comp_{Wh} .

5.2. Influence of Pragmatics

In interpreting and providing an acceptability judgment to a sentence, we attempt to eventually arrive at the intention of the speaker who uttered the sentence, based upon the syntactic analyses attained by way of the processing of that sentence. This procedure is also strongly influenced by various extra-grammatical factors related to semantics and pragmatics. As pointed out by Kitagawa and Fodor (2003), these can also create a strong bias toward the subordinate *Wh*-scope interpretation in the Subjacency construction, sometimes even breaking the scope-prosody correlation grammatical derivation induces.

A typical Subjacency example like (33) below illustrates this problem. The judgment indicated on the example is from its original source (Nishigauchi (1990: 31)).

- (33) **Satou-kun-wa* [Suzuki-kun-ga N_{ani}-o tabeta-kadouka]
 Mr. Sato-TOP Mr. Suzuki-Nom what-Acc ate-Comp_{wh}
 oboete-imasu-ka↑?
 remember-Comp_{wh}
 'What_i is such that Mr. Sato remembers [*whether or not* Mr. Suzuki ate it_i]?'

It is fair to say that this sentence cannot be easily interpreted as a direct *Wh*-question even when we assign *Global EPD*. Such an interpretation would require the presuppositions described in (34a, b).

- (34) a. There is some food item to which some special attention is being paid in such a way that whether or not Mr. Suzuki ate it is at issue.
 b. Mr. Sato remembers whether or not Mr. Suzuki ate some specific food item.

Satisfaction of the presuppositions in (34a, b), however, requires the envisioning of somewhat unusually elaborate pragmatic context, for example as in (35).

- (35) Mr. Suzuki is suffering from food poisoning and the identity of some specific food item as its cause is being sought. Mr. Sato is believed to remember whether or not Mr. Suzuki ate some specific food item, which may be the crucial piece of information. In quest of the identity of this food item, the question in (33) was asked of the person who is believed to know the answer.

If an informant is given the question in (33) without any context and asked for its acceptability judgment, it is not at all easy to imagine (35)

or any other suitable situation as elaborate as that. Syntactic tests, however, are typically carried out in such a null discourse context.

Moreover, in a question like (33), in which (34b) is presupposed, it is more natural to present the matrix clause in a nominalized form with the use of *-no* as in (36).

- (36) Satou-kun-wa [Suzuki-kun-ga NAni-o tabeta-kadouka] oboete-iru-no(-desu-ka)↑?

Furthermore, a factive predicate like *oboeteiru* 'remember' seems to be rather disharmonious with *-kadouka* 'whether or not,' which embeds a clause involving a presupposition neutral as to polarity, as pointed out to me by Satoshi Tomioka (personal communication). Therefore, when we replace *-kadouka* in (33) with *-ka*, which embeds a clause involving a presupposition with a more clearly positive disposition, the direct *Wh*-question becomes even more easily available to many speakers:

- (37) Satou-kun-wa [Suzuki-kun-ga NAni-o tabeta-ka] oboete-iru-no(-desu-ka)↑?
 'What₁ is such that Mr. Sato remembers [*if* Mr. Suzuki ate it₁]?'

By changing the matrix predicate and controlling the pragmatics of the sentence further as in (38) below, we can make the involved presuppositions much more effortlessly satisfiable, and make a matrix *Wh*-question interpretation quite naturally available.

- (38) Hokenjo-wa [shokuchudoku-kanja-zen'in-ga health.department-Top food.poisoning-victim-all-Nom NAni-o tabeta-ka] kakunin-shiyō-toshiteiru-no↑?
 what-Acc ate-Comp_{wthr} trying.to.confirm-Comp_{wh}
 'What₁ is such that the Department of Health is trying to confirm [whether all of those who suffered from food poisoning ate it₁]?'

This sentence is constructed in such a way that some specific pragmatic context can be effortlessly imagined in which the involved presuppositions as in (39a, b) can be almost automatically satisfied.

- (39) a. There is some food item to which some special attention is being paid because whether all of the victims of the food poisoning ate it is at issue.
 b. The Department of Health has identified some specific food item which they believe caused the food poisoning, and they are trying to confirm it.

When we re-examine (33) after going through all these, we now realize

how strong a bias this sentence has toward the rejection of the matrix *Wh*-scope despite the fact that grammar would permit it. In fact, it is generally quite difficult to construct examples whose semantics and pragmatics are friendly enough to avoid or at least dilute such a bias. The examples in (40) and (41) below are some such examples. It is not too difficult to imagine the existence of a potential suspect in (40) and a rival boy in (41), and matrix *Wh*-scope is correspondingly easier to recognize here (especially when the sentences are accompanied by *Global EPD*).

- (40) Keisatsu-wa [kanojo-ga korosareru chokuzen-ni
 police-Top she-Nom killed immediately.before
DAre-to atteita-ka] tsukitometa-no[↑]?
 who-with seeing-Comp_{wthr} found.out-Comp_{wh}
 'Who₁ is such that the police found out [whether she was
 seeing him₁ right before she was killed]?'
 (41) Tom-wa [Jane-ga **DO**no otokonoko-ni denwashiteita-ka]
 Tom-Top Jane-Nom which boy-Dat calling-Comp_{wthr}
 yatara kinishiteita-no[↑]?
 awfully worried-Comp_{wh}
 'Which boy₁ is such that Tom was so anxious about if Jane
 was calling him₁?'
 (42) Tom-wa [Jane-ga **DA**re to atteita-ka] tsukitometa-no[↑]?
 Tom-Top Jane-Nom who-with seeing-Comp_{wthr} found.out-Comp_{wh}
 'Who₁ is such that Tom was so anxious about if Jane was
 seeing him₁ right before she was killed?'

If we can find any one of these or other similar examples clearly acceptable, this will force us to question the claim that Subjacency as a grammatical condition must be observed in *Wh*-questions in Japanese.

We can summarize what we have observed so far as follows. Generally speaking, even a grammatical sentence is difficult to interpret, and hence is low in acceptability, when a language user fails to imagine a pragmatic context in which it makes sense. This general tendency can be well reasoned when we assume that something like Crain and Steedman's (1985: 333) "Principle of Parsimony" in processing is at work. On the assumption that perceivers of a sentence are not prepared to put any more effort than necessary into creating a discourse context to make sense of a sentence, it follows that they will prefer an interpretation with as few presuppositions as possible that are not already implicitly satisfied.

This consideration provides us with a clue to explaining the breakdown of the prosody-*Wh*-scope correlation observed by Hirotani (2003: Ch. 3) in her psycholinguistic experiment involving **perception**. In her experiment, 40 subjects accepted a subordinate *Wh*-scope interpretation

with the frequency of 54% when they heard 24 sentences accompanied by *Global EPD*. When we examine the example sentences used in this particular experiment, however, we notice that many of them involve semantics and pragmatics that tend to bias the perceivers toward the subordinate *Wh*-scope interpretation, as can be verified in those of her example sentences presented in (42).

- (42) a. Otetsudaisan-wa shujin-ga dare-o
 maid-Top master-Nom who-Acc
 sagashiteiru-ka iimashita-ka?
 looking.for-Comp_{wthr} said-Comp_{wh}
 'Did the maid tell you who the master was looking for?'
 over
 'Who₁ was the maid told you if the master was looking
 for her₁?'
 b. Naoko-san-wa Jakku-ga dare-o saketeiru-ka
 Naoko- Ms.-Top Jack-Nom who-Acc avoiding-Comp_{wthr}
 kiiteimasu-ka?
 informed-Comp_{wh}
 'Has Naoko been informed who Jack is avoiding?'
 over
 'Who₁ is such that Naoko has been informed if Jack is
 avoiding her₁?'
 over

With such biased example sentences involved, it is not surprising that the subjects in this experiment opted for the subordinate *Wh*-scope interpretations, ignoring what the prosody suggests, possibly with a certain amount of uneasiness. When we take into consideration such a handicap, it in fact is somewhat surprising that the subjects still reported the matrix *Wh*-scope interpretation with a frequency of 46%. This perhaps demonstrates the important role prosody plays in the comprehension of *Wh*-questions in Japanese. Thus, close attention to semantics and pragmatics of sentences allows us to elucidate how mismatches may arise between the prosody-scope correlation in *Wh*-questions that grammar encodes and the actual performance of language users in their comprehension.

Finally, let us also present examples which demonstrate that appropriate control of semantics/pragmatics and prosody of *Wh*-questions eliminates Subjacency effects involving islands other than *Wh*-islands. Note that the examples in (43) and (44) below involve a *Wh*-phrase within a complex NP island and an adjunct island, respectively, and this *Wh*-

phrase is accompanied by *ittai* 'on earth,' which is claimed in the literature to force (non-pied-piped) covert *Wh*-movement and hence the Subjacency effect (Pesetsky (1987)). Both sentences are, however, perfectly acceptable for most (if not all) speakers of Tokyo Japanese.

- (43) kono-urekko-sakka₁-ga tsugi-wa [NP [IP pro₁ [*ittai*
 this-popular-writer-Nom next on.earth
 NAni-o] daizai-ni-shita] sakuhin]-o happyou-suru-ka
 what-Acc wrote.about work-Acc make.public-Comp_{Wh}
 tanoshimi-desune.
 look.forward.to
 'It is a big thrill to wonder what material₁ is such that this
 popular writer will publish [a work in which s/he deals with
 it₁] next.'

- (44) pro₁ [CP [IP pro₁ ohirugohan-ni [*ittai* NAni-o]
 lunch.at on.earth what-ACC
 tabeta]-kara] guai-ga-waruku-natta-ndarou-ka? ²¹
 ate-because got.sick-Comp_{Wh}
 'I wonder what food₁ was such that s/he became sick
 [because s/he ate it₁ at lunch].'

The investigations in Section 5 so far demonstrate how difficult it is to construct appropriate example sentences to be used in the syntactic tests for Subjacency effects in *Wh*-questions in Tokyo Japanese. Unless we exercise extreme caution (or perhaps even if we do), the semantics/pragmatics tend to discourage the matrix *Wh*-scope in such a construction. Moreover, when the sentences are presented in writing to informants, there is a strong tendency for a prosodic pattern favoring the subordinate *Wh*-scope (i.e. *Local EPD*) to be assigned, whether the sentences are read aloud or silently. It is vital therefore for us to make extra efforts to neutralize such extra-grammatical factors and present the examples with their prosody fully specified in our syntactic tests. Naturally, we should exercise the same caution when we evaluate the

²¹ It is worth pointing out that the presuppositions involved here are independent of Pesetsky's (1987) D-linking. Note that the speaker who utters the questions in (38), (43) and (44), for instance, need not imagine a list of candidate answers. To the extent that the use of *ittai* 'on earth' is relevant, the acceptability of the *Wh*-questions in (43) and (44) should also demonstrate this point, although *ittai* probably is not a strict anti-D-link marker to begin with, given the fact that *ittai dotira* 'which of the two on earth' is perfectly legitimate.

examples provided in the literature. It must be kept in mind, however, that extra-grammatical factors like pragmatics are subject to individual differences in memory capacity, world view/knowledge, personal taste, and so on. The control of such factors therefore may not necessarily improve the acceptability judgment of all sentences equally well among speakers. If we can construct even a few clearly acceptable examples for any speaker, however, that will be good enough to let us call the alleged ungrammaticality into question. If, in fact, variability among speakers arises or even a single speaker's judgment on a single example is unstable, we should perhaps suspect that some extra-grammatical factors might be interfering with our grammaticality judgment.²²

6. Variability in Acceptability Judgment

Recall that we started our investigation in this work with the ambivalent grammaticality judgment indicated on the Subjacency example reported in the literature as in (1).

- (1) (?)~??John-wa [Mary-ga nani-o katta-kadouka]
 -Top -Nom what-Acc bought-Comp_{Whr}
 shiritagatte-iru-no?
 want.to.know-Comp_{Wh}
 'What_i does John want to know [whether Mary bought t_i]?'

The variable, subtle and unstable nature of the judgments involved in this area of investigation, of course, has not gone unnoticed in the liter-

²² Satoshi Tomioka (personal communication) notes that a subordinate *Wh*-phrase is sometimes interpreted as a matrix focus and assigned *Global EPD* while it must be interpreted as a subordinate question at the same time:

- (i) John-wa sakki-made-wa [Mary-ga Itsu kekkon-suru-ka]
 -Top until.a.few.minutes.ago -Nom when get.married-Comp_{Wh}
 siritagatteita-keredo, ima-wa [Mary-ga DOko-de
 wanted.to.know-though now-Top -Nom where
 kekkon-suru-ka] siritagatteiru.
 get.married-Comp_{Wh} want.to.know

'Until a few minutes ago, John wanted to know when Mary was getting married, but now he wants to know where she is getting married.'

This is a case in which the mismatch of EPD and *Wh*-scope takes place for a grammatical reason, whose account requires an elaborated system of E-agreement along the line of Kitagawa (to appear) with some extension.

ature. Roughly speaking, we can identify two types of research strategy that generative syntacticians have adopted to deal with the unexpected acceptability of Subjacency examples.

The first strategy is to assume that the variety of judgments stems from dialectal or idiolectal variation, and the researchers continue to advance their research focusing only on the grammar of the speakers who share judgments with them. This is certainly a viable option when we pursue our investigation of grammar under idealization. This strategy, however, also assumes a certain amount of responsibility on the part of the researchers who adopt it—responsibility for spelling out the exact variation in the grammar that yields distinct judgments, responsibility for justifying the postulation of such grammatical variation by demonstrating its independent reflection in other linguistic phenomena, and so on. Without fulfilling such responsibilities, adoption of this strategy cannot be fully justified, but I am not aware of any published work in which these responsibilities have been seriously taken. Since grammatical but unacceptable sentences for the matrix *Wh*-scope interpretation can be too easily constructed in Subjacency cases, as we have seen in Section 5, we should take much more seriously the existence of speakers who can accept the Subjacency sentences and reconsider the grammatical claim itself.

There also exists a more concrete reason that makes us hesitate to adopt the dialectal variation approach, at least in the way that has been done, when we cope with the variable judgments in (1). Hirotani (2004: Ch. 3: 22) reports that in the pre-test for her experiment on **perception**, 43 of 52 subjects, i.e. 82.69%, find it possible to interpret the Subjacency sentence in (45) below as not only an indirect *Wh*-question but also a direct *Wh*-question.²³

- (45) Yoshimoto-san-wa joushi-ga dare-o
 Mr/s.Yoshimoto-Top boss-Nom who-Acc
 shukkou-saseta-ka toiawasemashita-ka?
 send.on.loan-cause-Comp_{whr} asked-Comp_{wh}
 'Did Ms. Yoshimoto ask her boss who was sent on loan?' or
 'Who₁ is such that Ms. Yoshimoto asked her boss if that

²³ Note that, unlike examples in (42a, b) used in her production experiment, sentence (45) does not seem to involve semantics and pragmatics that tend to bias the perceivers toward the subordinate *Wh*-scope interpretation.

person_i was sent on loan?’

If we assume that this result reflects the real world more or less faithfully, what it indicates is that such an important theoretical claim as the existence of Subjacency effects in *Wh*-questions in Japanese was made based upon the judgment of less than 18% of language users, disregarding the judgment of a majority.²⁴

Another research strategy that has been often adopted to cope with the unexpected acceptability of Subjacency examples is to marginalize it by ascribing it to what is declared as exceptional and/or peripheral factors that do not belong to grammar and hence reside outside the domain of the explanation of generative syntacticians. For instance, it has been proposed to treat prosody as an extra-syntactic factor that can ‘repair’ ungrammaticality induced by the violation of syntactic constraints like the Subjacency Constraint. Nishigauchi (1990: 35), for instance, takes such a position and assumes that the Subjacency Condition can be overridden by ‘focus-assignment.’ In this approach, EPD in *Wh*-questions, especially *Global EPD*, is regarded as an exceptional extra-grammatical phenomenon which can, quite mysteriously, overturn our grammaticality judgment. As we have already confirmed with the contrast between (2a) and (3a) (repeated below), however, a *Wh*-question sounds natural when it is accompanied by EPD, but is noticeably awkward without it.

²⁴ The real question that needs to be answered therefore seems to be why there are speakers who always reject the matrix *Wh*-scope interpretation. Again, the extra-syntactic factors we have investigated above may play important roles. Since Hirotoni noted that those speakers who reject matrix *Wh*-scope tend to also find *Global EPD* unnatural, that might be the key factor to induce variation. There is also a possibility that such attention to prosodic variation may lead us to a genuine dialectal variation. Of the 9 subjects who rejected matrix *Wh*-scope in Hirotoni’s experiment, 6 were from areas where the Tokyo dialect is not spoken. It is possible that the grammar of these speakers indeed lacks *Global EPD* just as in the Kansai dialects (See the brief description of this point at the end of Section 2), and their judgments are interfered with by their own grammar when they attempt to process the examples from the Tokyo dialect.

While the semantics and pragmatics involved in sentence (45) seem to be reasonably elaborate and neutral to me and my informants, they may not be rich enough to permit matrix *Wh*-scope for some speakers. Variation in fact may arise in this regard. That is, some speakers may attempt to imagine some specific and suitable pragmatic context for a sentence quite thoroughly before pinning down their judgments, while others do not.

- (2) a. **DA**re-ga yoku ohiru-ni ramen-o toru-no↑
 who-Nom often lunch-for ramen-Acc order-Comp_{Wh}
 'Who often has ramen noodles delivered for lunch?'

- (3) a. #**da**re-ga **yo**ku o**hi**ru-ni **ra**men-o toru-no↑

Interpreting a *Wh*-word as focus and assigning EPD to its scope domain, in other words, is a **norm rather than an exception**, at least in Tokyo Japanese.

Furthermore, assignment of *Local EPD* versus *Global EPD* creates the contrast between (46a) and (46b) below, in which a *Wh*-phrase located in a declarative complement clause is to be associated with the matrix Comp.

- (46) a. #John-wa [Mary-ga **N**Ani-o eranda-to]
 John-Top Mary-Nom what-Acc selected-Comp_{That}
imademo omotteiru-no↑?
 still think-Comp_{Wh}
 'What₁ does John still think [*that* Mary selected *t*₁]?'
 (or '*Does John still think [*that* Mary selected *what*]?'')

- b. John-wa [Mary-ga **N**Ani-o eranda-to] imademo
 what-Acc -Comp_{That}
 omotteiru-no↑
 -Comp_{Wh}
 'What₁ does John still think [*that* Mary selected *t*₁]?'

Global EPD, in other words, is required for all scope-extraction, even out of a non-island. It is therefore **not** an exotic prosodic pattern by any means, whose function is to permit or mark exceptional overriding of the Subjacency Condition.

Compound EPD for the synchronized scope interpretation of multiple *Wh*-questions is not exceptional in any sense, either, but is required for such an interpretation, as can be seen from the contrast between (47a) and (47b) below.

- (47) a. **DA**re-ga **N**Ani-o katta-no↑
 who-Nom what-Acc bought-Comp_{Wh}
 'Who bought what?'
 b. #**DA**re-ga nani-o katta-no↑

Note that the absence of EPD starting from *nani-o* 'what-Acc' in (47b) prohibits this *Wh*-phrase from synchronizing its scope with the focused *Wh*-phrase *DA*re-ga 'who-Nom,' and makes this sentence uninterpretable other than as an echo question. It therefore is impossible to provide an

answer for both *Wh*-phrases in (47b).²⁵

The contrast between (48a) and (48b) below also demonstrates that *Global Compound EPD* is required for the scope extraction of multiple *Wh*-phrases even out of a non-island (headed by the declarative *Comp-to* 'that').

- (48) a. #John-wa [DAre-ga NAni-o katta-to] To m-ni
 John-Top who-Nom what-Acc bought-Comp_{That} Tom-Dat
 omowaseta-no↑
 made.believe-Comp_{Y/N}
 '*Did John make Tom believe *that who* bought *what*?'
 b. John-wa [DAre-ga NAni-o katta-to] Tom-ni
 John-Top who-Nom what-Acc bought-Comp_{That} Tom-Dat
 omowaseta-no↑
 made.believe-Comp_{Wh}
 'Who₁ is such that John made Tom believe [*that she*₁
 bought *what*]?'

Global Compound EPD, in other words, is nothing like an exotic prosodic pattern which permits or marks exceptional overriding of the Subjacency Condition, but is **a normal and required prosody in multiple *Wh*-questions**.

When we consider the theoretical implications of the research strategy in question, we also notice that it is not a position that can be adopted too casually. A researcher adopting this strategy would have to take an enormous burden of proof for the existence and explication of the extra-grammatical factors that are so strong as to reverse language users' grammaticality judgments. Such a researcher is, in a sense, significantly undermining the role of grammaticality judgments in the study of generative grammar, and it could even lead us to question the meaning of postulating a grammatical constraint that can be so easily overturned.

7. Summary and Conclusions

Through the examination of *Wh*-questions in Tokyo Japanese, we have attempted to show that even the formal study of syntax must be advanced with much more careful distilling of the data than usually

²⁵ See Kitagawa (to appear) for more detailed description of the problem here and the related issues.

exercised, with attention paid to such extra-syntactic/extra-grammatical factors as prosodic variability, processing preference and contextual information. Since such extra-syntactic factors are susceptible to personal variation and preference, it may be true that no such thing as an absolutely uniform and completely fixed grammaticality judgment is actually attainable. As has been demonstrated in Sections 2–5 above, however, proper control of these extra-syntactic factors significantly improves, for too many speakers, acceptability of what have been standardly treated as ungrammatical in some of the literature. It will be much less than satisfactory, therefore, to simply disregard or marginalize such variability in judgments. An approach incorporating closer attention to extra-syntactic factors, on the other hand, permits us to advance our research by explaining such variations in judgment.

The observations presented in this article do not necessarily reject the postulation of covert *Wh*-movement in Japanese. Nor do they directly threaten the validity of the Subjacency Condition in universal grammar.²⁶ Some researchers might still refuse our observations and account of the alleged Subjacency effect in Japanese, based upon the fact that they do not conform to what has been reported on English and other Indo-European languages. In languages involving overt *Wh*-movement like English, however, the scope-prosody correlation naturally may and does manifest itself differently, involving an extra factor of transferring phonetic features from one position to another. When we respect and pursue a sharper split of PF and LF under the Minimalist Program, in other words, we may consider that languages like English involve an extra factor of associating a *Wh*-phrase and Comp at PF in addition to their association at LF as required in Japanese. In this way, we can acquire a new perspective on our research which urges us to reanalyze and reevaluate the theory on movement based upon the insight obtained through the examination of the languages in which such overt dislocation is not necessarily induced.

²⁶ Kitagawa et al. (2004) in fact argue that “interpretive” island effects are observed in some multiple *Wh*-questions in Japanese and that they are induced by the application of covert *Wh*-movement.

REFERENCES

- Bader, Markus (1998) "Prosodic Influences on Reading Syntactically Ambiguous Sentences," *Reanalysis in Sentence Processing (Studies in Theoretical Psycholinguistics, Vol. 21)*, ed. by Janet Dean Fodor and Fernanda Ferreira, Kluwer, Dordrecht.
- Choe, Jae-Woong (1984) "LF WH-Movement: A Case of Pied Piping?," ms., University of Massachusetts, Amherst.
- Choe, Jae-Woong (1985) "Pitch-accent and q/wh Words in Korean," *Proceedings of 1985 Harvard Workshop on Korean Linguistics (WOKL)*, 113-123.
- Chomsky, Noam (2000) "Minimalist Inquiries: The Framework," *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, ed. by Roger Martin, David Michaels and Juan Uriagereka, 89-155, MIT Press, Cambridge, MA.
- Crain, Stephen and Mark Steedman (1985) "On Not Being Led Up the Garden Path: The Use of Context by the Psychological Syntax Processor," *Natural Language Parsing: Psychological, Computational and Theoretical Perspectives*, ed. by David R. Dowty Lauri Karttunen and Arnold M. Zwicky, 320-358, Cambridge University Press, Cambridge.
- Deguchi, Masanori and Yoshihisa Kitagawa (2002) "Prosody and Wh-questions," *NELS* 32, 73-92.
- Fodor, Janet Dean (1998) "Learning to Parse?," *Journal of Psycholinguistic Research* 7, 285-318.
- Fodor, Janet Dean (2002) "Prosodic Disambiguation in Silent Reading," *NELS* 32, 113-137.
- Hirose, Yuki (1999) *Resolving Reanalysis Ambiguity in Japanese Relative Clauses*, Doctoral dissertation, The Graduate Center of the City University of New York.
- Hirovani, Masako (2003) "Prosodic Effects on the Interpretation of Japanese Wh-questions," *University of Massachusetts Occasional Papers in Linguistics 27—On Semantic Processing* 117-137.
- Hirovani, Masako (2004) *Prosody and LF: Processing of Japanese Wh-questions*, Doctoral dissertation, University of Massachusetts, Amherst.
- Ishihara, Shinichiro (2002) "Invisible but Audible Wh-scope Marking: Wh-constructions and Deaccenting in Japanese," *WCCFL* 21, 180-193.
- Ishihara, Shinichiro (2003) *Intonation and Interface Conditions*, Doctoral dissertation, MIT.
- Jackendoff, Ray (1972) *Semantic Interpretation in Generative Grammar*, MIT Press, Cambridge, MA.
- Kim, Namhee (2002) "A Prosodic Analysis of Wh-Phrases in Korean," paper presented at Mini-Workshop on Prosody, Syntax and Information Structure, Indiana University.
- Kitagawa, Yoshihisa (to appear) "Wh-scope Puzzles," *NELS* 35.
- Kitagawa, Yoshihisa and Janet Dean Fodor (2003) "Default Prosody Explains

- Neglected Syntactic Analyses of Japanese," *Japanese/Korean Linguistics* 12, 267-279.
- Kitagawa, Yoshihisa Dorian Roehrs and Satoshi Tomioka (2004) "Multiple Wh-Interpretations," *Generative Grammar in a Broader Perspective: Proceedings of the 4th GLOW in Asia 2003*, 209-233.
- Kubo, Tomoyuki (2001) "Syntax-Phonology Interface in the Fukuoka Dialect," *Journal of the Phonetic Society of Japan* 5, 27-32.
- Kubozono, Haruo (1993) *The Organization of Japanese Prosody*, Kurocio, Tokyo.
- Kuno, Susumu (1973) *The Structure of the Japanese Language*, MIT Press, Cambridge, MA.
- Kuroda, S-Y. (to appear) "Prosody and the Syntax of Indeterminates," *Indiana University Working Papers in Linguistics Vol. 5—Syntax and Beyond*.
- Ladd, Robert (1996) *Intonational Phonology*, Cambridge University Press, New York.
- Lee, Hyo Sang (1982) "Asymmetry in Island Constrains in Korean," ms., University of California, Los Angeles.
- Lovrič, Nenad (2003) *Implicit Prosody in Silent Reading: Relative Clause Attachment in Croatian*, Doctoral dissertation, The Graduate Center of the City University of New York.
- Maekawa, Kikuo (1991) "Perception of Intonation Characteristics of WH and Non-WH Questions in Tokyo Japanese," *Proceedings of the XXII International Congress of Phonetic Science* 4, 202-205.
- Miyamoto, Edson T. and Shoichi Takahashi (2002) "The Processing of Wh-phrases and Interrogative Complementizers in Japanese," *Japanese/Korean Linguistics* 10, 62-75.
- Nagahara, Hiroyuki (1994) *Phonological Phrasing in Japanese*, Doctoral dissertation, University of California, Los Angeles.
- Nishigauchi, Taisuke (1990) *Quantification in the Theory of Grammar*, Kluwer, Dordrecht.
- Pesetsky, David (1987) "Wh-in-Situ: Movement and Unselective Binding," *The Representation of (In)definiteness*, ed. by E. J. Reuland and A. G. B. ter Meulen, 98-129, MIT Press, Cambridge, MA.
- Pierrehumbert, Janet and Mary Beckman (1988) *Japanese Tone Structure*, MIT Press, Cambridge, MA.
- Schütze, Carson T. (1996) *The Empirical Base of Linguistics: Grammaticality Judgments and Linguistic Methodology*, University of Chicago Press, Chicago.
- Selkirk, Elisabeth (1984) *Phonology and Syntax: The Relation between Sound and Structure*, MIT Press, Cambridge, MA.
- Selkirk, Elisabeth (2000) "The Interaction of Constraints on Prosodic Phrasing," *Prosody: Theory and Experiment*, ed. by Merle Horne, 231-262, Kluwer, Amsterdam.
- Sugahara, Mariko (2003) *Downtrends and Post-focus Intonation in Tokyo*

- Japanese*, Doctoral dissertation, University of Massachusetts, Amherst.
- Takahashi, Daiko (1993) "Movement of *Wh*-Phrases in Japanese," *Natural Language and Linguistic Theory* 11, 655-678.
- Tomioka, Satoshi (1997) "Wh-in-situ, Subjacency, and LF Syntax," ms., Cornell University.
- Tomioka, Satoshi (2004) "Pragmatics of LF Intervention Effects: Japanese and Korean Interrogatives," ms., University of Delaware.
- Truckenbrodt, Hubert (1995) *Phonological Phrases: Their Relation to Syntax, Focus, and Prominence*, Doctoral dissertation, MIT.
- Watanabe, Akira (1992) "Subjacency and S-structure Movement of WH-in-situ," *Journal of East Asian Linguistics* 1, 255-291.

Department of Linguistics
Memorial Hall 322, Indiana University
Bloomington, IN 47405, U.S.A.
e-mail: kitagawa@indiana.edu