

## UTTERING AND INTERPRETING TREES

Unabridged version of Kitagawa (2013: *English Linguistics* 30.1, pp. 313-357)

(Those parts which did not appear in the published version are indicated by yellow highlights.)

YOSHIHISA KITAGAWA

*Indiana University*

Department of Linguistics  
Memorial Hall 322, Indiana University  
Bloomington, IN 47405, U.S.A.  
e-mail: kitagawa@indiana.edu  
<http://www.iub.edu/~ykling/>

\*I am grateful to Aaron Albin, Julie Auger, Muamera Begovic, Isabelle Darcy, Laurent Dekydtspotter, Leslie Gabriele, Norbert Hornstein, Yuyin Hsu, Marija Jankovic, Miguel Rodriguez-Mondoñedo, Seth Wood and two anonymous reviewers for invaluable comments, discussion and/or judgments. All the remaining errors are my own. An abridged version of this paper appears in *English Linguistics* 30.1.

1. Introduction.....	1
2. Richards on Pronunciation and Syntax .....	2
2.1. Distinctness in Linearization.....	2
2.2. Prosodic Boundaries and <i>Wh</i> -questions.....	9
2.3. Phase for 'Look-ahead'.....	17
3. Synchronization of Sounds and Meanings.....	18
3.1. Physical Marking for Logical Interpretations.....	18
3.2. Grammaticalizing Sound-Meaning Correlations .....	27
3.2.1 Overt Movement as 'Look-ahead'.....	28
3.2.2 Prosody-Semantics Correlations as 'Look-across' .....	29
3.2.3 Synchronizing and Splitting Sounds and Meanings .....	29
3.2.4 Interface Licensing.....	31
3.2.4.1 Overt Syntax with Prosody.....	32
3.2.4.2 Overt Syntax with Displacement.....	36
3.2.4.3 Structural Condition on the Implementation of L-legibility and Subjacency....	37
3.2.5 Overt Syntax Revisited.....	40
3.3. Summary of Section 3:.....	42

# UTTERING AND INTERPRETING TREES

YOSHIHISA KITAGAWA

*Indiana University*

## Abstract

This article first selectively overviews the discussion on the interaction of phonology and syntax offered in Richards (2010), then pursues the same project from a different angle. Pointing out that both *wh*-in-situ and overt *wh*-movement express sound-meaning correlations by appealing to some physical marking at (near) surface level, we propose that both should be regarded as instances of overt syntax. Accordingly, the notion 'overt syntax' is redefined as the grammatical procedure that synchronizes PF- and LF-effects. We then argue that the synchronized PF-LF effects of overt syntax can be captured if feature complexes that induce the legibility of linguistic expressions at PF and at LF are encoded into lexical items. This approach enables us to solve what we called a 'look-across' problem posed by the prosody-semantics correlations observed in *wh*-in-situ as well as a 'look-ahead' problem posed by overt movement. It also frees us from various potential problems arising in the 'prosodic boundary' approach proposed by Richards, permitting us to strictly maintain the major tenet of the minimalist program.

*Keywords:* *Wh-questions, prosody, Wh-movement, Wh-in-situ, PF-LF synchronization, legibility*

## 1. Introduction

Generative syntax has developed a research methodology which relies on language users' introspective judgments about the acceptability and interpretation of linguistic expressions. Behind this approach is the notion of the autonomy of syntax, which allows us to hypothesize that the syntactic component of grammar can be studied as an independent module. This methodology has proven successful in elucidating several core properties of grammar that cannot be attributed to any cognitive ability other than the syntactic module of the language faculty. It is undeniable, however, that this methodology has sometimes led us to cherish the illusion that our judgments directly reflect our 'idealized grammar.' In reality, we can never provide pure grammaticality judgments of linguistic expressions. Without exception, all we can provide is *acceptability* judgments, which are inevitably influenced by various extra-syntactic factors such as prosodic variation, processing loads, contextual/pragmatic biases, and frequency statistics. All researchers can do, therefore, is attempt to identify and control these influencing factors in our linguistic data as much as possible so that we can *approximate* grammaticality judgments. In this sense, it is extremely important for syntacticians to make efforts to find out how syntax interacts with these extra-syntactic factors in order to improve the precision of their research.

Syntacticians have long known, in particular, that the acceptability and interpretation of a sentence depends on the prosodic pattern assigned to it. Such observations, however, have often been made only in passing, left behind as unsolved mysteries or as matters irrelevant to grammar, typically mentioned in footnotes. Even when consistent correlations between prosody and semantic interpretation are discovered, they are often presented merely as descriptive observations without elucidating how the grammar makes such correlations possible, let alone

addressing what the exact role of syntax is. In this regard, Norvin Richards' recent monograph *Uttering Trees* (Richards (2010)) is a rare and innovative piece of work. It attempts to substantiate the view that some of properties of syntax are determined by its interface with phonology. In Section 2 of this article, we first provide a selective overview of this monograph. Then in Section 3, we explore an approach distinct from the one proposed and argued for in the monograph, concentrating our discussion on the materials presented in Chapter 3 of the book.

## 2. Richards on Pronunciation and Syntax

The two main chapters of Richards (2010), Chapter 2 and Chapter 3, both discuss the relation between pronunciation and syntax. Beyond this general commonality, however, they are largely distinct and independent chapters and there is little connection between the two. Below, we overview the two chapters one by one, starting with Chapter 2.

### 2.1. Distinctness in Linearization

This chapter first advocates the view that grammar universally demands two linguistic expressions to be different when they are pronounced in sequence, then attempts to find out how exactly such a constraint should be formalized. The investigation starts with multiple ellipsis remnants in English as in (1)-(2) below (Richards' (6)-(7) with his acceptability judgments indicated).

- (1) a. \*Every man admired every woman, *except* [DP **John**] [DP **Mary**]  
b. \*I know everyone insulted someone, but I don't know [DP **who**] [DP **whom**]
- (2) a. Every man danced with every woman, *except* [DP **John**] [PP **with Mary**]  
b. I know everyone danced with someone, but I don't know [DP **who**] [PP **with whom**]

Richards claims that the contrast here follows from the formal constraint being proposed, which bans two remnant DPs from being pronounced in sequence in (1a-b). On the other hand, no such violation arises in (2a-b) since the ellipsis-remnants are of two distinct types (DP and PP).

The proposal made in this chapter involves the background assumptions as listed in (3).

- (3) a. The linear order of syntactic nodes and lexical items is determined when Spell-Out applies in accordance with the Linear Correspondence Axiom.

Linear Correspondence Axiom (LCA: Kayne (1994: 33))

Let X, Y be nonterminals and x, y terminals such that X dominates x and Y dominates y. Then if X asymmetrically c-commands Y, x precedes y.

- b. Spell-Out applies cyclically each time a strong phase is created. Strong phases include CP, transitive (not intransitive)  $\nu$ P, PP and KP (Chomsky (2000), Chomsky (2001)).
- c. Lexical heads are merged through 'Early Insertion' as complete lexical items. In contrast, functional heads are merged without their phonological information. Their phonological

information is introduced post-syntactically by 'Late Insertion,' as argued for in Distributed Morphology (Halle and Marantz (1993), Embrick and Noyer (2001), et al.).

- d. Linearization is ordered before Late Insertion, hence the phonological features of functional heads have no effect on linearization. Linearization treats overt and covert functional heads on par.

Within this framework, the constraint in (4) is proposed to be a formal condition imposed on linearization.

(4) Distinctness (Richards' (5))

If a linearization statement  $\langle \alpha, \alpha \rangle$  is generated, the derivation crashes.

This condition rejects trees in which two nodes of type  $\alpha$  are to be linearized in the same "Spell-Out domain," defined as the complement (and, hence, the sister) of the phase head (Nissebaum (2000)). It is also claimed that what counts as distinct types of  $\alpha$  in (4) may vary cross-linguistically. For instance, Richards argues that it is defined by syntactic category in English, by case in Japanese, and by properties like gender and animacy in other languages.

With this proposal, Richards examines various phenomena that, at first glance, do not appear to have anything to do with the notion 'distinctness.' He invites the reader, often in an amusing way, to analyze these phenomena in accordance with the insightful mechanisms offered by his approach. He also makes maximal use of his rich knowledge of typologically diverse languages in the pursuit of this project. The diversity of languages and empirical phenomena covered in this chapter is quite impressive, and the analyses and generalizations offered therein are highly enlightening. The work presents itself as an exemplary research project based on an innovative idea pursued under a tightly-knit formal system of grammar.

Since an attempt to discuss all of the topics and empirical phenomena covered in this chapter would be too reckless, I will only point out in this section some apparent misanalyses of the data and theoretical concerns that arise in the proposed approach, concentrating on the languages that permit me to offer reasonably detailed and deliberate analyses.

First, the impressive diversity of empirical coverage in this monograph in itself might actually have produced the adverse effect of overextending the limits of his analysis. More specifically, some of the empirical phenomena claimed to involve Distinctness violations may in fact not involve such violations at all. For instance, the contrast between (5a) and (5b) below (Richards' (89a-b)) is presented as supporting evidence that the Distinctness effect is sensitive to case in Japanese.

- (5) a. [Sensee-o    hihansita] gakusee-ga koko-ni oozei iru-kedo,  
teacher-Acc criticized student-Nom here-at many exist-but  
*dare-ga dare-o-ka oboeteinai*  
who-Nom who-Acc-Comp<sub>wh</sub> remember-Neg

(literally) 'There are lots of students here who criticized teachers,  
but I don't remember who who.'

- b. \*[Sensee-ga sukina] gakusee-ga koko-ni ooze iru-kedo,  
 teacher-Nom like student-Nom here-at many exist-but  
*dare-ga dare-ga-ka oboeteinai*  
 who-Nom who-Nom-Comp<sub>wh</sub> remember-Neg  
 (literally) 'There are lots of students here who like teachers,  
 but I don't remember who who.'

Richards reports that, while multiple sluicing in Japanese generally allows multiple DP remnants marked by distinct case particles, as in (5a), those marked by the same case, as in (5b), are not permitted.<sup>1</sup> He also reports that acceptability judgments are significantly improved in sentences involving identical case marking but a difference in animacy, as in (6) below, implying that an animacy feature may also play a partial role in the definition of distinctness in Japanese.

- (6) [Doobutu-ga sukina] hito-ga koko-ni ooze iru-kedo,  
 animal-Nom like person-Nom here-at many exist-but  
*dare-ga nani-ga-ka oboeteinai*  
 who-Nom what-Nom-Comp<sub>wh</sub> remember-Neg  
 (literally) 'There are lots of people here who like animals, but I don't remember who what.'

However, the source of the awkwardness that arises in (5b) (at least in its first round of parsing) may be independent of a Distinctness violation. To begin with, (5b) is handicapped by involving a subject NP in the antecedent clause that is ambiguously analyzable, as indicated in (7a-b).

- (7) a. [<sub>NP</sub> [<sub>TP</sub> Sensee-ga **pro**<sub>1</sub> sukina] gakusee<sub>1</sub>]  
 teacher-Nom like student  
 'the student(s) whom the teacher(s) like(s)'  
 b. [<sub>NP</sub> [<sub>TP</sub> **pro**<sub>1</sub> Sensee-ga sukina] gakusee<sub>1</sub>]  
 teacher-Nom like student  
 'the student(s) who like(s) the teacher(s)' (= *Intended interpretation in (5b)*)

The antecedent clause in (5b) therefore makes it difficult for language users (i.e. listeners and readers) to determine how the multiple *wh*-questions fit into specific word order and indicate a 'sorting key' (Kuno (1982)). This troublesome situation is only made worse by the multiple remnants of *wh*-phrases with identical case marking. While the subject NP in (6) is ambiguous between 'people who like animals' and 'people whom animals like' and therefore has the same potential problem, the former is the more pragmatically (and discursively) likely interpretation, with *doobutu-ga* 'animal-NOM' analyzed as the object. More generally, this means that an animacy distinction within multiple remnants encourages the language user utilize pragmatic likelihood, thus making it easy to determine how the remnants fit into default word order in sentences like (6). In fact, if we reduce the likelihood of ambiguity in the subject NP of the antecedent clause,

<sup>1</sup> Note that this means that "NP + case particle" in Japanese does not constitute KP, which is regarded as one of the phases. This may contradict with what is claimed in his Chapter 3 on prosodic phrasing.

as in (8) below, greatly improved acceptability can be obtained, even though the multiple remnants have the same case and the same animacy.

- (8) [Aidoru-kasyu-ga sukida-tteyuu] tiineezayaa-ga sonoba-ni nanninka itakedo,  
 idol-singer-Nom like-saying teenager-Nom there-at some existed-but  
 dono-ko-ga dono-kasyu-ga(-datta)-ka(-wa) oboeteinai.  
 which-kid-Nom which-singer-Nom-was-Comp<sub>Wh</sub>-Top remember-Neg

(literally) 'There were several teenagers there who said they love idol singers, but I don't remember which kid which singer.'

This result brings to question the relevance of Distinctness (defined in terms of case or animacy) to the acceptability difference in (5).<sup>2</sup>

Next, responding to a reviewer's observation, Richards also concludes that "multiple clefts in Japanese are generally allowed, but not when the clefted phrases are DPs with the same case, as in (9b) (Richards' (92b))." (p. 45)

- (9) a. [Sukina-no]-wa Taroo-ga Hanako-o da  
 like-that.which-Top Taroo-Nom Hanako-Acc Cop

(literally) 'It is Taroo Hanako that likes.'

- b. ??[Sukina-no]-wa Taroo-ga Hanako-ga da  
 like-that.which-Top Taroo-Nom Hanako-Nom Cop

(literally) 'It is Taroo Hanako that likes.'

The same interpretive problems just pointed out for (5b) arise here again for (9b), perhaps even more gravely since neither subject nor object is overtly expressed in the antecedent clause ([*pro pro sukina-no*]). Moreover, multiple clefts must be interpreted as a set of 'paired contrastive foci' ("Taro's liking Hanako, Hiroshi's liking Mayumi," etc.), yet an appropriate pragmatic context is not too easy to imagine for (9b). A discourse like (10A-B) below perhaps provides such a context, and the multiple clefts involving identically case-marked animate NPs in (10B) become noticeably easier to interpret.

- (10) A: Tasikani oya-wa saisyo-no-ko-ga itiban kawaii-toka,  
 certainly parent-Top first.child-Nom most feel.affectionate.to-and  
 sinkon-dansee-wa yomesan-ga kawai-kute-tamaranai-toka yuu-kedo,  
 newly.wed-man-Top wife-Nom irresistibly.affectionate-and said-but

'It's certainly true that they say parents feel most affectionate toward their first child and newlywed men feel irresistibly affectionate toward their wives, ...'

<sup>2</sup> (5b) in fact becomes much more (if not completely) acceptable when we replace *sensee* 'teacher' with *sensee-gata* 'teachers (plural),' the first *dare* 'who' with *dono-sensee* 'which teacher,' and the second *dare* with *dono-gakusee* 'which student, leading us to the same conclusion. Moreover, if we fix the interpretation of the antecedent clause in (5b) adopting the analysis in (7a), the identical multiple remnants there will be more easily accepted, especially if the plural *sensee-gata* 'teachers' is used in the antecedent clause.

B: [tonikaku muzyoookende saikooni kawaii-tteyuu-no]-wa  
 at.any.rate unconditionally maximally feel.affectionate.to-said-that.which-Top  
 [ziityan-baatyan-ga mago-ga]-desyoo.  
 grandpa-grandma-Nom grand.child-Nom-Cop  
 (literally) 'At any rate, it is grandparents grandchildren who feel unconditionally and  
 maximally affectionate toward.'

The animacy distinction improves the situation further as in (11) below, making the thematic relation between the multiple clefts even clearer.

(11) Nihonzin-wa kaori-no tuyoi tiizu-ga nigate-tokatte yoku yuu-kedo,  
 Japanese-Top flavor-Gen strong cheese dislike-and.the.like often say-but  
 'They say Japanese people dislike cheese that has a strong flavor, but ...'  
 [Doositemo-taberarenai-tte itiban yoku kiku-no]-wa  
 can.never.eat-that most often hear-that.which-Top  
 [gaizin-ga nattoo-ga]-dana.  
 foreigner-Nom fermented.soybeans-Nom-Cop  
 (literally) 'It is foreigners fermented soybeans that I most often hear can never eat.'

We thus are led to consider that distinctness in terms of case or animacy may not play a major role in the awkwardness detected in (9b) either. <sup>3</sup>

The above observations lead us to a more general potential theoretical problem. Among the numerous examples reported to involve Distinctness violations, quite a few are only relatively less acceptable rather than completely unacceptable. Yet if Distinctness violations represent a grammatical problem caused by the crash of a derivation as prescribed by the Distinctness Condition (4), they should be much more clearly unacceptable due to their ungrammaticality. The multiple clefts in (9b) in Japanese, for instance, involve only some amount of awkwardness and are not judged totally unacceptable. Likewise, the Distinctness violation claimed to arise from consecutive *a*-marked DPs in Spanish seems to be merely "not perfectly well-formed" (p. 31) relative to their improvement in DPs avoiding such a violation through movement, heaviness, and a prosodic break) (Richards' ??(60) vs. (61a-c)). In Kinande, the optionality and dispreference of a 'linker' for the VP-internal multiple DPs (Richards' (203)-(204)) may present another similar case. If a linker is  $v_C$  and creates a strong phrase, it should either exist or not exist — that is, the derivation should either converge or crash.

<sup>3</sup> We can also improve the sentence as in (9b) by controlling its pragmatics as in (i).

(i) Tasikani kono syoosetu-de-wa danzyo-kankee-ga kanari irimidaremasu-kedo  
 certainly this novel-in-Top man-woman-relationship-Nom considerably jumbles-but  
 'It is true that the man-woman relation jumbles quite a bit in this drama, but ...'  
 yappari [hontooni sukinana-no]-wa Taroo-ga Hanako-ga desyoo.  
 after.all truly love-that.which-Top Taroo-Nom Hanako-Nom Cop  
 (literally) 'after all, it is Taroo Hanako that truly loves.'

The situation is similar for multiple *wh*-fronting in Serbo-Croatian, where Distinctness is discussed in terms of case and gender. The crucial contrasts do not involve any clear ungrammaticality (e.g. Richards' ??(107a), ?(109) versus (108)). My informants also confirm that the sentence allegedly involving the failure of distinctness in terms of case and masculine as in (12a) below (Richards' (111)) improves greatly when we replace *which man* and *which boy* with *which father* and *which son*, respectively, as in (12b).

- (12) a. ??**Kojeg** je **čovjeka** **kojeg** **dječaka** sram?  
**which.Gen** Aux **man.Gen** **which.Gen** **boy.Gen** ashamed  
 'Which man is ashamed of which boy?'
- b. **Kojeg** je **oca** **kojeg** **sina** sram?  
**which.Gen** Aux **father.Gen** **which.Gen** **son.Gen** ashamed  
 'Which father is ashamed of which son?'

We did not alter any case or gender marking between the two sentences in (12). All we did in (12b) was to provide the arguments that presumably make it easy to imagine a pragmatic context in which a pair-list interpretation of "X being ashamed of Y" makes sense.

Thus, some cases alleged to involve a Distinctness violation exhibit only a somewhat lowered acceptability, and even this lowered acceptability can often be improved with an appropriate pragmatic context. These observations suggest that the nature of these problems is extra-grammatical rather than grammatical. We thus are led to consider that at least some of the empirical phenomena dealt with in Chapter 2 reside outside the realm of the notion 'Distinctness violation' being advocated there.<sup>4</sup> It perhaps is not impossible to treat such gradient judgments by appealing to an optimality-theoretic approach, possibly limiting its range of application to the phonology-syntax interface as in Pesetsky (1998). That is not, however, what is being pursued in Richards' monograph, and such an account of the observed phenomena probably cannot be put forth too easily in his approach without threatening the integrity of the notion 'grammar.'

---

<sup>4</sup> There also are cases in which the unacceptability of a sentence is ascribed to Distinctness violation but some other factor seems to be at least partially responsible for lowering its acceptability. For example, the remnant DPs of Quotative Inversion (and subject-aux inversion) as in (ic) below (Richards' (22c)) are awkward, but for some speakers, *tell* is more suitable for introducing an indirect quote than a direct quote to begin with, as shown in (iia) and (iic). *Say*, on the other hand, does introduce a direct quote more comfortably but not with a DP, as shown in (iib).

- (i) a. "It's cold," said John  
 b. "It's cold," said [<sub>DP</sub> John][<sub>PP</sub> to Mary]  
 c. \*"It's cold," told [<sub>DP</sub> John][<sub>DP</sub> Mary]
- (ii) a. John **told** Mary that he was not feeling well.  
 b. John **said** \*(to) Mary, "I am not feeling well."  
 c. ??John **told** Mary, "I am not feeling well."



Another theoretical concern arises when we witness that the core theoretical assumptions become increasingly proliferated in attempting to account for a variety of empirical phenomena in several different languages and to cope with the relevant counterexamples. For instance, the list of the properties defining Distinctness extends from 'category' to 'case,' 'gender,' and 'animacy.' If Distinctness violations indeed arise when the nodes are "identified by features" (p. 41), the list could be expanded almost indefinitely. It therefore is not clear where the line can be drawn between those features that are relevant to Distinctness and those that are not. Similarly, as the chapter proceeds, the list of categories functioning as phase heads keeps growing from C to K,  $v_C$ , and  $P_C$ , some of which may not function as phase heads depending on the language. Moreover, once it is taken into consideration how Distinctness interacts with the derivation, the notion Distinctness itself becomes multiplied. Richards distinguishes between Distinctness that can be repaired by grammatical operations like movement ("weak Distinctness") and Distinctness that cannot be similarly repaired ("strong Distinctness"). It is also suggested that Distinctness violation must be globally avoided throughout the derivation. The notion distinctness is also claimed to play a role in determining economy of derivation, as described in (13) below, which "expresses the intuition" that "distinctness-violating configurations are to be avoided as much as possible, not just as parts of final PF representations but throughout the derivation." (p. 114)

(13) Derivational Distinctness (Richards' (249))

Given a choice between operations, prefer the operation (if any) that causes a Distinctness violation to appear as briefly as possible in the derivation.

This state of affairs leaves the impression that such a proliferation continues every time the proposed approach encounters new data. Since one of the aims of the monograph is to offer a typological analysis, the proliferation of theoretical assumptions to deal with distinct languages is definitely necessary and justifiable. At the same time, such a high degree of complication of the core theoretical assumptions proposed in the monograph should be somewhat more fully justified and independently motivated.

Some fundamental questions also remain unanswered. First, why must Linearization be ordered before Late Insertion (cf. (3d))? Such an assumption effectively makes phonetic content irrelevant to linearization, yet it is generally considered that the goal of linearization is to make phonetic content pronounceable and abstract features perhaps need no linearization to begin with. It therefore strikes us as quite strange that the linearization of phonetically null and hence unpronounced functional categories like  $v$ 's must be constrained. Second, it is also unclear why a feature like animacy, which is semantic in nature, plays a role in the determination of Distinctness. Third, it is argued with an example like (14) below (Richards' (64)) that what matters in the determination of Distinctness is whether or not a pair of nodes in a linearization statement  $\langle \alpha, \alpha \rangle$  are located within the same Spell-Out domain rather than their string adjacency. A Distinctness violation not involving string adjacency as in this case makes us wonder whether Distinctness defined in the monograph really has anything at all to do with the linearization of phonetic content.

(14) \*"It's cold," [ $v_C$  told] [ $v_P$  **John**] *sadly* [**Mary**]]

Fourth and finally, as discussed above with examples from Japanese, there may also exist some phenomena that have an independent source of awkwardness whose adverse effect is only enhanced by a sequence of semantically non-distinct elements. In fact, even the examples similar to (15a-b) below (Richards' (2a-b)), which are presented in this monograph as clear-cut ungrammatical sentences, are reported not to be uniformly rejected (Lasnik (To appear)):

- (15) a. \*I know everyone insulted someone, but I don't know [<sub>DP</sub> **who**] [<sub>DP</sub> **whom**]  
 b. \*I know every man insulted a woman, but  
 I don't know [<sub>DP</sub> **which man**] [<sub>DP</sub> **which woman**]

Among the sixteen informants I consulted with, only four straightforwardly rejected both of (15a-b). All other speakers found (15b) noticeably better, if a little strange, especially after it was pointed out that the intended interpretation of the multiple *wh*-phrases is a pair-list reading. Two speakers told me that both of (15a-b) become acceptable when they assign an emphatic stress to both *wh*-phrases. As such, the situation is somewhat similar to that of the Japanese examples above. This type of variance among speakers and/or sentences appears to indicate the involvement of one or more extra-grammatical sources of awkwardness. <sup>5</sup>

It is possible that this monograph might have erroneously included several phenomena that the proposed grammatical condition on Distinctness should actually not be concerned with. If so, then by redefining its range of empirical investigation, it might be possible to make the Distinctness condition simpler and tighter (regardless of whether linearization of phonetic content turns out to be relevant). In this regard, a careful sorting of the empirical facts seems inevitable in this extremely interesting and valuable research project.

## 2.2. Prosodic Boundaries and *Wh*-questions

In Chapter 3, Richards attempts to advocate a large-scale view of the universal aspects as well as the crosslinguistic variation in *wh*-questions. First, it is claimed phonology universally constrains *wh*-questions: in every language, *wh*-questions are formed in such a way as to ensure the *wh*-phrase and its associated complementizer (Comp) are separated by as few minor phrase (MiP) boundaries as possible. Second, it is claimed languages vary systematically due to the interaction of phonology and syntax. In particular, whether a language syntactically derives a *wh*-question through overt *wh*-movement or whether it does so through *wh*-in-situ can be predicted based on the following two factors:

---

<sup>5</sup> (15a-b) became perfectly acceptable to all speakers if the verb in the antecedent clause is not elided, as in (ia-b) below.

- (i) a. I know everyone insulted someone, but I don't know [<sub>DP</sub> **who**] *insulted* [<sub>DP</sub> **whom**].  
 b. I know every man insulted a woman, but  
 I don't know [<sub>DP</sub> **which man**] *insulted* [<sub>DP</sub> **which woman**].

Under the Distinctness condition approach, it must therefore be shown that the *wh*-phrases remain under the same strong phase in (15a-b) but not in (ia-b). Such a distinction may indeed arise due to the syntactic derivation involved in multiple sluicing, but how exactly it arises must be properly demonstrated.

(16) (a) Whether prosodic representations in the language are constructed by mapping (i) the left boundary or (ii) the right boundary of a syntactic phrase onto the boundary of a prosodic category, in particular of MiP.

(b) Whether the language is (i) Comp-initial or (ii) Comp-final.

Richards assumes that formation of a prosodic *wh*-domain automatically performs a restructuring of the existing MiP phrasing, "allowing Minor Phrases to be recursive, with multiple Minor Phrases being composed into a single, overarching Minor Phrase," (p. 149) which Shinya, et al. (2004) call Superordinate MiP (SMiP). For example, the schematized prosodic representation in (17) below might come to be mapped onto that in (18) when a SMiP containing a *wh*-phrase and its associated Comp is successfully created, resulting in well-formed *wh*-in-situ.

(17) C [MiP ] [MiP ][MiP wh]

(18) [C                          **wh** ←SMiP]

On the other hand, if the SMiP created by the formation of a *wh*-domain fails to contain its associated Comp as in (19) below, the *wh*-phrase must move toward the Comp to reduce the number of intervening MiP boundaries, resulting in overt *wh*-movement.

(19) [**wh** C [MiP ] [MiP ][SMiP → ~~wh~~]  
       ↑ \_\_\_\_\_|

In other words, how a *wh*-question is syntactically represented in a given language depends on whether the SMiP boundary and Comp are located on one same side of the base-generated *wh*-phrase (resulting in overt movement), as in (19), or on the opposite sides of the *wh*-phrase (resulting in *wh*-in-situ), as in (18). In a nutshell, the proposed system "permits overt *wh*-movement just in case it improves the prosodic structure of the *wh*-question" (p. 155). Richards emphasizes throughout Chapter 3 (pp. 148, 155, 185, 190) that his approach is concerned only with phonological representations and not with their phonetic implementation, hence *wh*-domains need not be associated with any (particular) phonetic effect. In other words, all he is concerned with is whether or not MiP boundaries intervene between a *wh*-phrase and its associated Comp, whatever phonetic effects this may have.

(20) and (21) below are the grammatical devices Richards adopts in this approach.

(20) Algorithm for prosodic *wh*-domain formation (Richards' (10))

- a. For one end of the larger Minor Phrase (= SMiP [YK]), use a Minor Phrase boundary that was introduced by a *wh*-phrase.
- b. For the other end of the larger Minor Phrase (= SMiP [YK]), use any existing Minor Phrase boundary.

(21) Condition on prosodic *wh*-domains (Richards' (13))

Given a *wh*-phrase  $\alpha$  and a complementizer C where  $\alpha$  takes scope,  $\alpha$  and C must be separated by as few Minor Phrase boundaries as possible, for some level of Minor Phrasing (= SMiP [YK]).<sup>6</sup>

This approach predicts the existence of four types of languages, as summarized in (22) below (Richards' (76) with some reorganization). Richards attempts to verify this prediction by examining each of the languages listed there (and a few others) as representative examples.

(22)	C to right of TP	C to left of TP
<b>Prosodic boundaries to left of XPs</b>	(i) Japanese ( <i>wh</i> -in-situ)	(iii) Tagalog ( <i>wh</i> -move, L)
<b>Prosodic boundaries to right of XPs</b>	(ii) Basque ( <i>wh</i> -move, R)	(iv) Chicheŵa ( <i>wh</i> -in-situ)

(22i)  $\langle_{\text{SMiP} \rightarrow} \mathbf{wh} \dots \dots \mathbf{C} \rangle$      *wh*-in-situ     Japanese

(22ii)  $\langle \dots \mathbf{wh} \leftarrow_{\text{SMiP}} \dots \mathbf{C} \rangle$      *wh*-move to right<sup>7</sup>     Basque  
|\_\_\_\_\_↑

(22iii)  $\mathbf{C} \dots \langle_{\text{SMiP} \rightarrow} \mathbf{wh} \dots \rangle$      *wh*-move to left     Tagalog  
↑|\_\_\_\_\_

(22iv)  $\langle \mathbf{C} \dots \dots \mathbf{wh} \leftarrow_{\text{SMiP}} \rangle$      *wh*-in-situ     Chicheŵa

Richards is careful to acknowledge a potential theoretical problem involved in this approach, beginning his investigation by stating, "throughout this chapter I will make very unorthodox assumptions about the interaction between the syntax and the phonology; ... the idea will be that the syntactic operation of overt *wh*-movement takes place just in case the prosody requires it. The approach therefore involves a straightforward type of look-ahead." (pp. 145-146). Referring to a similar look-ahead problem involving Quantifier Raising, he also remarks, "Taken together, the look-ahead problems suggest that our understanding of the interfaces is flawed in some way." (p. 215, fn. 1).

Richards' proposal is highly valuable and meritorious in several respects. To begin with, it seriously examines the interaction of prosody and syntax, a topic which has long been regarded as important but has not been too actively investigated in the study of generative syntax. Even more admirable is that this topic is being pursued in a typological framework, a highly ambitious project to say the least.

<sup>6</sup> Note that this is based on the assumption that the original MiP boundaries in (17) are eliminated in the formation of a *wh*-domain rather than recursively represented.

<sup>7</sup> Basque, in fact, does not behave this way, and Richards adopts the scrambling of a non-*wh*-phrase to achieve a similar effect. (p. 164)

The proposal is also valuable in more concrete terms because of the relatively high degree of falsifiability it offers. The typological predictions made in the proposed approach are directly testable since all languages are expected to involve a clear and simple correlation between the directionality of the Comp head and the placement of MiP boundaries on the one hand, and the way *wh*-questions are realized in syntax on the other hand.

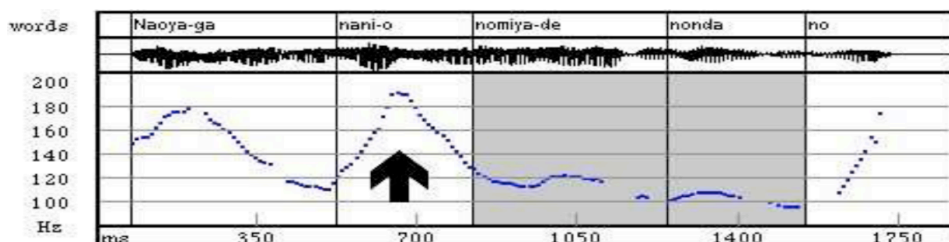
Another respect in which I find the proposed approach praiseworthy is that it clearly acknowledges the limitation of the existing syntactic mechanisms that force overt movement by appealing to 'strong features' (or 'EPP features'), characterizing them as mere stipulation (p. 143). In fact, Richards directly rejects the use of such mechanisms as a potential solution to the look-ahead problem, pointing out that it would offer "no way of explaining the absence of complementizer-final languages with obligatory overt *wh*-movement to the left periphery of the clause" (p. 155).

For the proposed approach to gain firm support within the minimalist program, two essential tasks must be fulfilled. First, the approach must be demonstrated to be empirically plausible by evaluating its predictions with data from as many languages as possible. Second, the look-ahead problem must be solved somehow, presumably either by revising the model of the language faculty itself or by devising a way to solve the problem within the current model. This certainly is too serious and fundamental a problem to be left unsolved.

Richards' empirical investigation to confirm the typological predictions made by the proposed approach begins with the examination of Japanese, a relatively well-studied language with *wh*-in-situ and clause-final Comp, cf. (22i). For Japanese, (i) many authors have posited left boundary placement in the prosodic phonology (e.g., Selkirk and Tateishi (1988) and Selkirk and Tateishi (1991)), (ii) it has long been pointed out that prosodic *wh*-domains are phonetically distinctive (e.g., Pierrehumbert and Beckman (1988) and Maekawa (1991)), and (iii) several authors have argued for a grammatical encoding of the correlation between the prosodic *wh*-domain and the scope domain of *wh*-focus (e.g., Deguchi and Kitagawa (2002), Ishihara (2003)). In (23) below, the prosodic *wh*-domain typically realized in Tokyo Japanese is indicated on the example sentence as follows: the *wh*-focus is enclosed by a box and its pitch prominence is indicated by bold-face, the pitch-range compression by "post-focal reduction" is indicated by the underlined reduced fonts (up to the associated Comp), and the utterance-final interrogative rise is indicated by a question mark. The moras that are associated with high tones are indicated by upper case letters, whether their pitch ranges are reduced or not. This coding scheme will be used throughout Section 3 later on. The example sentence and its pitch track in (23) are from Ishihara (2003: 53) (Richards' (2b)).

(23) NAoya-ga NAni-o noMIya-de NOnda-no?  
 Naoya-Nom what-Acc bar-at drank-Comp<sub>wh</sub>

'What did Naoya drink at the bar?'



Richards claims that Japanese verifies the existence of a language of the type in (22i), exemplifying a *wh*-in-situ language involving left boundary placement ((i) above) and Comp-finality.

(22i) <<sub>SMiP</sub>→ **wh** ... . . . **C**> *wh*-in-situ Japanese

Japanese indeed presents a very clear case demonstrating the correlation between *wh*-in-situ and prosody with its distinctive prosodic *wh*-domain ranging from the *wh*-word to the Comp, which also correlates with the scope domain of *wh*-focus ((ii) and (iii) above). Thus, the evaluation of the typological predictions in (22) appears to be off to a good start.

The prosodic structure postulated for (22i) in Japanese, however, is not without problems. It has been repeatedly noted in the literature that the LHL contour involved in the reduced items in (23) (*noMiya-de* 'bar-at' and *NOnda* 'drank') is compressed but has not entirely disappeared, as can be observed in the pitch-track diagram in (23) (Maekawa (1994), Kitagawa (2005), Ishihara (2011)). Since the initial rise (LH) is observed in these prosodic words, their MiP boundaries must have been retained, contrary to the prosodic structure assumed for (22i).


Toward the end of the chapter, Bangla (a.k.a. Bengali) was also examined as another language to verify the typological variety in (22i). Richards argues that this language is similar to Japanese, as it exhibits Comp-finality, placement of prosodic boundaries on the left, and *wh*-in-situ. Moreover, when clausal extraposition is involved, it also shares the same restriction as Japanese on *wh*-scope interpretation (pp. 191-193). At the same time, however, Richards reports a phonological analysis that is incompatible with the proposed approach (p. 195). Hayes and Lahiri (1991: 60-61) argue that a *wh*-phrase is normally focused in Bengali and the location of its pitch peak is predicted by a "boundary tone ( $H_p$ )" associated with the *right* boundary of the focused constituent, as illustrated in (24) and (25).

(24) tumi [**kón** **mač<sup>h</sup>er-mat<sup>h</sup>a**] ranna-korle?  
 you which fishhead | cooked  
**H<sub>p</sub>**  
 'Which fishhead did you cook?'

(25) tumi [**kón** **mač<sup>h</sup>e-r**] mat<sup>h</sup>a ranna-korle?  
 you which fish-'s | head cooked  
**H<sub>p</sub>**  
 'Which fish's head did you cook?'

A *wh*-question in Bangla, in other words, behaves exactly like that in Japanese, but at least some authors advocate the view that the *wh*-domain in Bangla places its prosodic boundary in the way converse to the prosodic phrasing assumed for (22i). This offers a direct counterargument to the proposed boundary-based approach.

The other three typological varieties in (22ii-iv), in fact, are not as cleanly attested. First, (Ondarroa) Basque is proposed as a language of the type in (22ii).

(22ii) <...wh ←<sub>SMiP</sub>> ... C      *wh*-move to right      Basque  


Based upon previous research, it is concluded that a MiP boundary in this language is placed at the right edge of a phrase (though only under specific circumstances). Being a head-final language, it is also assumed that Comp is located to the right of the clause in Basque (though is phonetically 'invisible'). It is therefore predicted that Basque should permit rightward *wh*-movement to Comp, as in (22ii). In reality, however, a *wh*-phrase in this language appears immediately before a verb as in (26) below, rather than in its base-generated position as in (27a) or in the landing site of rightward *wh*-movement to Comp as in (27b).<sup>8</sup>

(26) Jon      **señek**      <sub>SMiP</sub>>                      **ikusi**      rau-C?      (Richards' (29a))  
          Jon-abs **who**-erg                      see-prf      aux.pr  
          'Who saw Jon?'

(27) a.      \***Señek**      <sub>SMiP</sub>>      Jon      <sub>MiP</sub>>      **ikusi**      rau-C?  
                  **who**-erg                      Jon-abs                      see-prf      aux.pr  
          b.      \*~~**Señek**~~      <sub>SMiP</sub>>      Jon      <sub>MiP</sub>>      **ikusi**      rau-C      **Señek?**  
                  **who**-erg                      Jon-abs                      see-prf      aux.pr      **who**-erg

Richards follows Arregi (2002) in assuming that (26) is derived by "altruistic" scrambling of the non-*wh*-phrase as in (28).

(28) Jon      **señek**      ~~Jon~~ **ikusi**      rau?  
          Jon-abs **who**-erg      |      see-prf      aux.pr  
          ↑ \_\_\_\_\_ |

Note that only one MiP boundary intervenes between the *wh* and Comp in (26) as opposed to two in (27a), achieving improvement in prosodic structure, although both sentences involve *wh*-in-situ rather than *wh*-movement. With this analysis, Richards concludes that "the condition on prosody will thus have to be stated as an economy condition, requiring the grammar to 'do its best' to minimize the number of Minor Phrase boundaries between the *wh*-phrase and the complementizer; ..." (p. 164).

To cope with the problem of there being no rightward *wh*-movement to Comp as in (27b), Richards cites Elordieta's (1997) observation that the pitch of the postverbal material in Basque is always radically compressed. He ultimately settles on the view that "postverbal material in Basque is already subject to conditions on prosody which might be incompatible with the conditions on *wh*-prosody being explored here." (p. 163). This may indeed turn out to be the reason why rightward *wh*-movement to Comp is not observed in Basque. However, in order for this account to be valid, the incompatibility assumed here must be shown to involve prosodic phrasing. (Recall that the proposed approach concerns only prosodic phrasing and not its phonetic implementation.) Presumably, whatever causes prosodic reduction of the postverbal

<sup>8</sup> Richards refers to the contrast between (26) and (27a) as a "preference" in word order (p. 163).

materials must require the existence of more than one intervening MiP boundary between the moved *wh* and Comp in (27b). What is even more pressingly required of the proposed approach, though, is an account of why rightward overt *wh*-movement is virtually unattested in spoken languages.<sup>9</sup> If prosodic boundary placement on the left and Comp-finality are both attested as widely available options, then such a gap in the typology poses a serious problem to the proposed approach. It appears that much work is yet to be done in this area.

Tagalog is proposed as a language of the type in (22iii).

(22iii) C ... <<sub>SMiP</sub>→ wh ...>      *wh*-move to left  
 ↑ \_\_\_\_\_ |

Based upon his own pilot study, Richards concludes that MiP boundaries in this language are generally placed at the left edges of KPs (which is claimed to be a phase). Since Tagalog is a Comp-initial language (though Comp is phonetically invisible in matrix clauses), it is predicted to involve obligatory leftward *wh*-movement. This prediction is upheld:

(29) a. **Kailan** C umuwi                    si Juan <<sub>SMiP</sub> ~~kailan~~? (Richards' (59))  
          **when**            Nom-went.home Ang Juan                    **when**  
          'When did Juan go home?'

b. \*C Umuwi                    si Juan <<sub>SMiP</sub> **kailan**?  
          Nom-went.home Ang Juan                    **when**

A different prediction made under this approach is not borne out, however. Richards notes that the MiP boundary *immediately following the verb* is deleted due to "an overriding requirement that the verb not be in a phrase by itself" (p. 171), hence the lack of a MiP boundary after *umuwi* in (29) above. As such, *wh*-in-situ should be possible in immediately post-verbal position, as in (30).

(30) C V <<sub>MiP</sub> wh ...

Such a construction, however, is not generally possible. The only exception is when one particular *wh* word *nino* 'who' is used, and even this is only marginally permitted (especially when other items follow it). Thus, while Tagalog generally is of type (22iii), the difficulty of *wh*-in-situ in (30) casts a shadow over the integrity of the overall typological predictions.

Chichew̃a is proposed as a language of the type in (22iv).

(22iv) <C ... ...wh <←<sub>SMiP</sub>>      *wh*-in-situ      Chichew̃a

<sup>9</sup> See Cecchetto, et al. (2009) for the claim that *wh*-phrases undergo rightward movement in various sign languages.



In this language, the vowel in the penultimate syllable of a phonological phrase is lengthened, and an underlying H tone is retracted from the final mora onto this lengthened penultimate mora (e.g., *mlendó* 'visitor' → *mleéndo*: Kanerva (1989), Truckenbrodt (1999)), suggesting MiP boundaries in this language are placed at the right edge of phrases. In addition, since Chicheŵa is a head-initial language, Comp falls to the left of the associated clause (though it is phonetically invisible in matrix clauses). Based on these two observations, Chicheŵa is predicted to permit *wh*-in-situ, and indeed, the position of the *wh*-word in (31) below confirms this prediction. (Examples (31) and (32) are Richards' (69) and (70), which are both cited from Downing (2005).)

- (31) <C anaményá **chiyáani** <sub>SMiP</sub>> ndi mwáálá <sub>MiP</sub>>  
 he.hit what with rock  
 'What did he hit with the rock?'

Upon closer examination, however, a phenomenon is observed here that is unexpected under the proposed approach. Typically, a VP in Chicheŵa is mapped onto a single MiP without any internal prosodic boundaries, as is confirmed by a comparison of the underlined vowels in the following example:

- (32) <anaményá nyumbá ndi mwáálá <sub>MiP</sub>>  
 he.hit house with rock  
 'He hit the house with the rock'

However, a SMiP boundary *does* appear within the VP in (31) (as indicated by the lengthening and H tone on the penultimate syllable of the *wh*-word). This suggests that, contrary to the claim being made, it may in fact *not* be advisable to attempt to characterize prosodic *wh*-domains in Chicheŵa by appealing to the general prosodic phrasing in the language.

Richards also analyzes French and Brazilian Portuguese as exemplifying the type in (22iv).

- (22iv) <C ... ..**wh** ←<sub>SMiP</sub>> *wh*-in-situ

Both languages have head-initial Comp and are claimed to impose metrical boundaries at the right edge of maximal projections. As predicted in the proposed approach, French and Portuguese both exhibit *wh*-in-situ just as in Chicheŵa. One complication, however, is that *wh*-questions via movement can *also* be formed in these languages, as illustrated in (33b) and (34b).<sup>10</sup>

<sup>10</sup> Egyptian Arabic is also introduced as another language to exhibit this property.

- (i) Egyptian Arabic: (Richards' (19))

- a. < C qel ʕali ʃtara **?eeh** <sub>SMiP</sub>>?  
 uncle Ali bought what

'What did Ali's uncle buy?'

- b. < **?eeh** C ʃtara qel ʕali ~~?eeh~~ <sub>SMiP</sub>>?

(33) French (Richards' (95))

a. <C Tu as vu **qui** <sup>SMiP</sup>>?  
you have seen who  
'Who did you see?'

b. <**Qui** C tu as vu ~~qui~~ <sup>SMiP</sup>>?

(34) Brazilian Portuguese (Richards' (96) from Pires and Taylor (2007))

a. <C O Bill comprou o **que** <sup>SMiP</sup>>?  
the Bill bought the what  
'What did Bill buy?'

b. <**O que** C o Bill comprou ~~o~~ **que** <sup>SMiP</sup>>?  
the what the Bill bought the what

Richards does in fact note that leftward *wh*-movement ought to also be an option for the languages of the type in (22iv) under the proposed approach "as long as the movement improves the prosodic structure of the question" (p. 155). If so, then it must be the case that the MiP boundaries within the SMiP created by the *wh*-phrase in (22iv) are erased in cases of *wh*-in-situ but somehow maintained in cases of *wh*-movement. It is not clear how this state of affairs can be obtained, but this is precisely what must be confirmed in order to provide evidence for the proposed approach.

### 2.3. Phase for 'Look-ahead'

Finally, in the concluding section of Chapter 3, a new potential solution for the look-ahead problem (mentioned in the paragraph below the table in (22) in Section 2.2 above) is offered. It starts with the claim that the only syntactic maximal projections relevant to prosodic boundary marking are 'phases' (Chomsky (2001)). It is assumed that all material in the sister domain of the phase head are sent to PF by Spell-Out, while the material at the edge remains part of the syntactic computation. At PF, prosodic boundaries are inserted "on the right or left edge of the phase," (p. 201) and "the PF component returns to the syntax an object that has been partly annotated for prosody." (p. 202) In this way, the type of phonological information relevant to syntax is determined via Spell-Out before the syntactic derivation is complete, and the application of *wh*-movement in syntax does not have to 'look-ahead' for the satisfaction of the phonological condition.

An appeal to the notion of a phase offers a new kind of 'window' through which we can view the prosody-syntax interaction in new ways, which may provide solutions to some of the potential problems of the originally proposed approach pointed out in Section 2.2 above. However, since the details of this approach are not spelled out and virtually no independent supporting arguments are provided, it is difficult to see how this approach can actually do everything it is claimed to do. For instance, a question that immediately arises is how Spell-Out can establish the prosodic boundaries of the phase at PF while its edge (and hence the higher of its syntactic boundaries) has yet to be sent there. (Recall that what is sent to PF by Spell-Out is the material in the sister domain of the phase head, not the material of the entire phase.) It is difficult to imagine how Spell-Out makes it possible for a prosodic boundary of the phase to be

inserted in the phonology without the presence of its corresponding syntactic boundary. The assumption that PF can selectively return certain types of prosodic information to syntax is also an entirely new claim that calls for full-scale justification. In fact, it is not even clear if there is any substantial difference between claiming that "phonology returns to the syntax some aspects of phonology" and claiming that "syntax can look-ahead and access aspects of phonology". Thus, even if we take into consideration that the proposed phase approach was offered only as a premature potential solution, it does not solve the look-ahead problem in question in any straightforward way.

### 3. Synchronization of Sounds and Meanings

Richards' investigation of the prosody-syntax interaction makes clear, simple, and valuable typological predictions. The above cross-linguistic examination demonstrates that the predicted language types in (22i-iv) are indeed existent, except for that in (22ii). At the same time, however, serious unsolved problems and/or unanswered questions have been posed for each of the four cases (including type (22i) as exemplified by Japanese). The fact that all of these problems/questions concern the phonological representation of prosodic phrasing casts a shadow over the integrity of the typological predictions based upon prosodic phrasing. Moreover, as argued above, we must also conclude that the look-ahead problem still persists in the proposed approach. Given this state of affairs, I feel compelled to shy away from the present attempt to explain the typological variation of *wh*-questions by appealing to prosodic phrasing. <sup>11</sup>

In closing his monograph, Richards states:

"The theories presented here raise many questions for possible further study. Like any explanations, my explanations have to stop somewhere, and we should ask whether still deeper levels of explanation are possible. **Why should a *wh*-phrase and its scope position have to share a prosodic domain?** [emphasis by YK]" (p. 206)

In this section, we will attempt to provide an answer to the question asked at the end of this quote. We believe that a proper answer to this question will approach the syntactic typology of *wh*-questions without recourse to prosodic phrasing and in a way that avoids the look-ahead problem.

#### 3.1. Physical Marking for Logical Interpretations

While we are no longer able to maintain that general prosodic phrasing plays a key role in the typology of *wh*-questions, we still have reason to believe that Richards is heading toward the right direction in his investigation of this topic. In particular, it strikes us as a correct generalization to claim that overt *wh*-movement applies when a language fails to supply an appropriate prosodic *wh*-domain, and to claim that that the position of Comp plays an important role in this syntactic choice. At the core of this generalization is Wachowicz's (1978) idea that all languages must provide some form of surface physical cue for marking *wh*-questions and Cheng and Rooryk's (2000) claim that prosody can function as one of such cues. Elaborating further on

---

<sup>11</sup> Let us remind ourselves here that it was mainly Richards' fair and sincere effort to make us aware of the existence of potential problems and counterexamples and to openly discuss them which allowed us to scrutinize the proposed approach for its fair evaluation.

this view, we hypothesize that assigning a distinctive *wh*-prosodic pattern and moving a *wh*-phrase to the periphery of CP share the same PF-function of physically indicating *wh*-questions. (See also Zubizarreta (1998) for an approach treating movement in the context of prosody.)

Along these lines, Deguchi and Kitagawa (2002) and Kitagawa (2005) argue that *wh*-prosody physically marks the interpretive scope domain of *wh*-questions in Tokyo Japanese. For example, a potentially ambiguous question can be disambiguated with prosody, as illustrated in (35) and (36).<sup>12</sup>

- (35) [CP<sub>1</sub> JYOn-wa [CP<sub>2</sub> MEarii-ga **NA**ni-o katTA-ka] \_\_\_\_\_ Imademo siRITAGAtteiru-no?  
 John-Top Mary-Nom **what**-Acc bought-Comp<sub>Whr</sub> even.now want.to.know-Comp<sub>Wh</sub>  
 (literally) '**What** does John still want to learn *whether* Mary bought?'
- (36) [CP<sub>1</sub> JYOn-wa [CP<sub>2</sub> MEarii-ga **NA**ni-o katTA-ka] \_\_\_\_\_ Imademo siRITAGAtteiru-no?  
 John-Top Mary-Nom **what**-Acc bought-Comp<sub>Wh</sub> even.now want.to.know-Comp<sub>YN</sub>  
 'Does John still want to learn **what** Mary bought?'

In (35), the prosodic domain extends to the matrix Comp *-no* (as evidenced by the post-focal reduction being prolonged to the end of the utterance), and the subordinate *wh*-phrase takes matrix scope. In (36), on the other hand, the prosodic domain is terminated at the subordinate Comp, and the *wh*-phrase takes subordinate scope.

*Wh*-prosody also plays a similarly critical role in sentences where the *wh*-phrase is located in a *declarative* subordinate clause, as in (37) below. Such sentences can be accompanied by only the prosodic pattern in (37a) in order to permit its matrix scope interpretation (the only plausible interpretation).

- (37) a. [CP<sub>1</sub> JYOn-wa [CP<sub>2</sub> MEarii-ga **NA**ni-o eRAnda-to] \_\_\_\_\_ Imademo oMOtteiru-no?  
 John-Top Mary-Nom what-Acc bought-Comp<sub>That</sub> even.now think-Comp<sub>Wh</sub>  
 '**What** does John still think *that* Mary selected?'
- b. # [CP<sub>1</sub> JYOn-wa [CP<sub>2</sub> MEarii-ga **NA**ni-o eRAnda-to] \_\_\_\_\_ Imademo oMOtteiru-no?

Here, the sentence sounds natural when the post-focal reduction (hence the *wh*-prosodic domain) reaches the end of the utterance, as in (37a). It sounds quite awkward, on the other hand, when the *wh*-prosodic domain is terminated at the end of the subordinate clause as in (37b). This is presumably because the prosody forces the (non-declarative) *wh*-phrase to be associated with the declarative Comp *-to* within the subordinate clause.

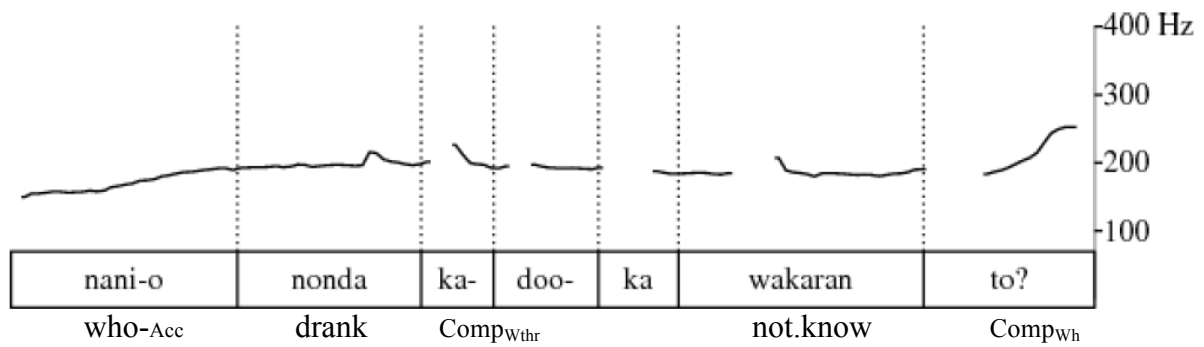
The contrasts in the two pairs of sentences just discussed indicate that prosody plays an important role to physically mark the interpretive domain of *wh*-focus, reinforcing the overt

<sup>12</sup> In glosses of these and other examples, each distinct function of complementizers in Japanese is indicated as Comp<sub>Wh</sub> (Wh-scope maker), Comp<sub>Whr</sub> (a polar-question complementizer), Comp<sub>YN</sub> (yes/no question marker) and Comp<sub>That</sub> (declarative complementizer). Recall also the notation for indicating prosody on linguistic examples described in the paragraph above (23).

question marker (e.g., *-ka/-no* in Japanese). See Deguchi and Kitagawa (2002) and Kitagawa (2005a) for more details.<sup>13</sup> Quite interestingly, it has also been reported that prosodic *wh*-domains in Fukuoka Japanese show similar patterns but are realized in a phonetically different way (Kubo (1989) and Smith (2005)). The contour for Fukuoka Japanese, illustrated in (38) below (from Smith (2013: 120)), starts with a rise on the *wh*-word, after which high pitch (indicated by underlined capital letters) is maintained until the end of the *wh*-scope domain, and then ends with an utterance-final interrogative rising contour as in (38). (We will examine a potentially ambiguous case in Fukuoka Japanese similar to (35) and (36) in Section 3.2.4.1 below.)

(38) [CP<sub>1</sub> ... [CP<sub>2</sub> ... naNi-O NONDA-KADOOKA] WAKARAN-TO]?  
           who-Acc drank-Comp<sub>wh</sub>                          not.know-Comp<sub>wh</sub>

(literally) 'What doesn't X know whether Y drank?'



Let us now hypothesize that whatever method of physical marking may be adopted for *wh*-questions (assigning a distinctive *wh*-prosodic pattern or moving a *wh*-phrase to the periphery of CP, etc.), its primary purpose is to indicate both of the following:<sup>14</sup>

- (39) a. The item to be interpreted as focus
- b. The constituent which constitutes its scope domain

To fulfill (39a), the *wh*-focus itself is generally expressed with a morpheme or word belonging to a special class, i.e. *wh*-words. In addition, languages also involve the additional physical marking of the *wh*-focus word itself. To fulfill (39b), the beginning or the end of the *wh*-focus domain is also physically signaled. In performing the two tasks in (39), the following three elements naturally play a significant role: the position of the *wh*-phrase, the position of its associated Comp, and the prosody across the region of the sentence between the two. When we reanalyze the language types in (22i-iv) paying attention only to the positions of the *wh*-phrase and Comp (rather than to prosodic phrasing), we obtain (40i-iv).<sup>15</sup>

<sup>13</sup> Kitagawa (2005a) and Kitagawa and Fodor (2006) argue that native speakers of Japanese unconsciously and implicitly assign *wh*-prosody even when they process written *wh*-questions in silent reading.

<sup>14</sup> At this point, we settle for this informal statement of the generalization, postponing its formalization to Section 3.2.

<sup>15</sup> Note that we have not added anything new or extra to Richards' approach by revising (22i-iv) into (40i-iv). All we have done is to avoid any appeal to prosodic phrasing. Note also that Richards' condition on

(40i)	[ <sub>CP</sub> ... <b>wh</b> ... C]	<i>wh</i> -in-situ	Japanese
(40ii)	[ <sub>CP</sub> ... <b>wh</b> ... C]  _____↑	<i>wh</i> -move to right	?
(40iii)	[ <sub>CP</sub> C ... <b>wh</b> ...] ↑_____	<i>wh</i> -move to left	English/Tagalog
(40iv)	[ <sub>CP</sub> C ... <b>wh</b> ...]	<i>wh</i> -in-situ	Chichew̃a

This generates several typological predictions, which we will now evaluate in turn. First, it appears that the physical marking of a *wh*-question in languages of type (40i) is typically carried out via prosody. In Tokyo Japanese, for instance, focus prominence is placed on the *wh*-item in the form of elevated high pitch accent, thus physically marking its focus status and fulfilling (39a). Moreover, the terminating point of the post-focal reduction indicates that the end of the CP is the scope domain for *wh*-focus, thus fulfilling (39b). (Refer back to (35)-(37) above as well as the pitch-track diagram in (23).) Since this analysis does not make reference to prosodic phrasing, the presence of MiP boundaries within the post-focal domain (as discussed in Section 2.2 above) does not pose any problem, unlike in the prosodic boundary approach.<sup>16</sup>

In Comp-initial languages like English and Tagalog, for which no such prosodic marking is available, the physical marking of a *wh*-question is achieved by overt *wh*-movement, thus representing the language type in (40iii). Having been displaced from its base-generated position and placed at the left periphery of the clause, the overtly-moved *wh*-phrase comes to be identified as the item to be interpreted as focus. Since the moved *wh*-phrase must land in the vicinity of the invisible Comp at the beginning of the clause, the scope domain of *wh*-focus can be automatically identified as the maximal projection of this Comp (CP).<sup>17</sup> In a sense, leftward overt *wh*-movement in Comp-initial languages can be characterized as an efficient way to physically mark all the pieces of information necessary for the interpretation of *wh*-questions. First, the item to be interpreted as focus is clearly indicated since it has been dislocated. Moreover, the *wh*-focus interpretive domain is also clearly indicated since it corresponds to the maximal projection of the Comp having the specifier position to which the *wh*-phrase has been dislocated. The movement strategy is adopted also in Tagalog, as observed in (29a) above. Recall that the absence of *wh*-in-situ in the immediately post-verbal position in this language, as in (30), remained unaccounted for in the prosodic boundary approach. In contrast, this does not pose any problem for the proposed 'physical marking' analysis since it does not appeal to prosodic phrasing.

---

*wh*-prosody in (21) also appeals to the notions of *wh*-phrase and Comp Compin defining a *wh*-domain. In the end, we will reach an analysis in which the linear position of Comp plays a less crucial role.

<sup>16</sup> Igarashi and Kitagawa (2007) argue that "post-focal reduction" in Tokyo Japanese and "post-focal expansion" in Fukuoka Japanese mentioned by Richards (pp. 146-148) can both be regarded as a prosodic strategy of creating an unusually monotonous non-alternating tonal contour to distinctively mark the interpretive domain of focus. In that sense, these two distinct prosodic patterns of *wh*-questions can be assimilated even in terms of their phonetic implementation.

<sup>17</sup> For the sake of simplification, we will not take into consideration the 'split CP' analysis as in Rizzi (1997).

The language type in (40iv) also corresponds to Comp-initial languages, but this time to ones for which the physical marking of a *wh*-question *can* be carried out by prosody. Although Chicheŵa presumably is a language of this type, the literature often reports difficulty recognizing any particular prosodic properties distinctively associated with *wh*-questions in this language. Myers (1996: footnote 1, p. 29), for instance, is forced to pigeonhole their description because of "a great deal of variation both within and between speakers." Downing (2011: 32) reports that she finds no distinctive prosodic properties for *wh*-question other than a raised overall pitch. Downing and Pompino-Marschall (2013: 9-10, 16), however, present a quite interesting discussion which has a potential to explain how such difficulty arises. They first report their experimental results on the prosody involved in the *answers* to *wh*-questions in Ntcheu Chicheŵa as in (41a-b).

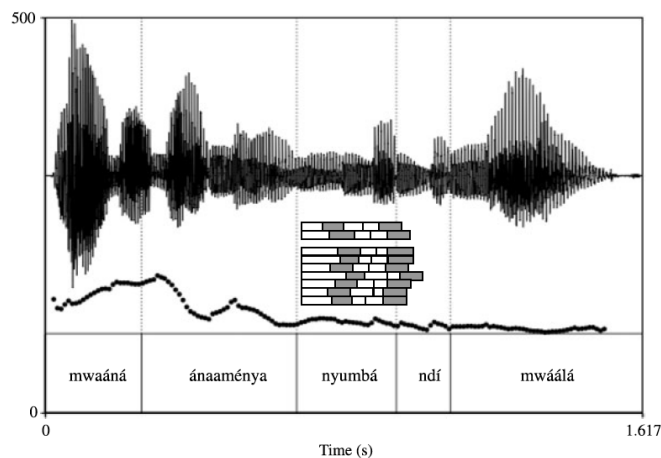
(41) a. Broad focus: (pp. 9, 16)

Q: Chí-na-chítika ndi **chi-yáni?**  
 7<sub>SBJ-TAM</sub>-happen COP 7-what

**'WHAT HAPPENED?'**

A: Mwaná a-ná-menya **nyumbá** ndí mwalá.  
 1-child 1<sub>SBJ-TAM</sub>-hit 9.house with 3.rock

**'THE CHILD HIT THE HOUSE WITH A ROCK.'**

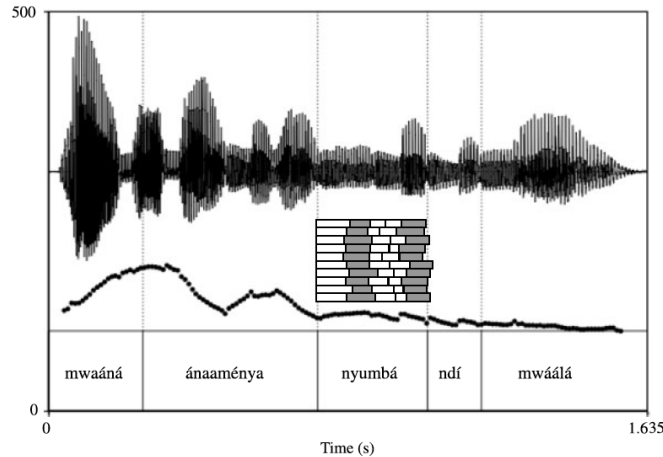


b. Narrow focus: (pp. 10, 16)

Q: Mwaná a-ná-menya **chi-yáni** ndí mwalá?  
 1-child 1-SBJ-TAM-hit 7.what with 3.rock

'**WHAT** did the child hit with the rock?'

A: Mwaná a-ná-menya **nyumbá** ndí mwalá.  
 1-child 1-SBJ-TAM-hit 9.house with 3.rock  
 'The child hit **THE HOUSE** with a rock.'

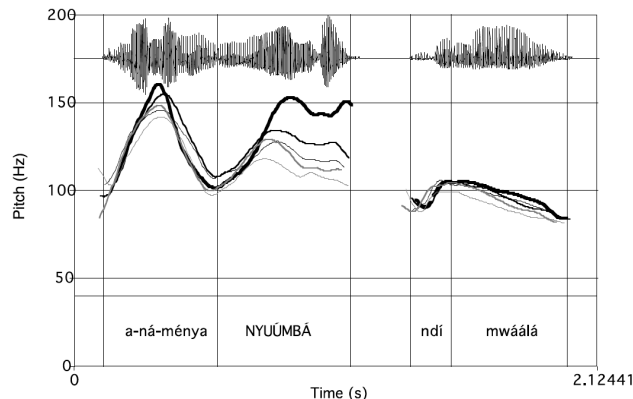


They observe first that focus is prosodically indicated only by the lengthening of the final foot of the focus domain rather than by any specific prosodic property of the focus expression itself, whether the answer to a *wh*-question involves *broad focus* as in (41a-A) or *narrow focus* as in (41b-A). As a result, narrow and broad foci in Ntcheu Chicheŵa are prosodically indistinguishable in most cases, as illustrated by the two pitch-track diagrams in (41). Downing and Pompino-Marschall also report, however, that some speakers assign a distinct prosodic pattern as in (42) below when they provide an answer to a *wh*-question involving narrow focus as in (41b-Q). (|| indicates a pause.)

(42) Narrow focus: (pp. 5, 23)

A: A-na-mény-á **NYUMBÁ** || ndí mwalá.  
 1-SBJ-RECENT.PAST-hit 9.house with 3.rock

'S/he hit the **HOUSE** with a rock.'





As indicated by the pitch-track diagram in (42), the pitch of the focused word is raised, thus disturbing the expected downstep. The raised pitch is then followed by a steep fall into the pause. As a result, the High tone associated with the post-focal word is realized noticeably lower and makes the focused element prominent. Downing, et al. (2004: 177) called this an 'anti-accent' effect and regarded it as a distinctive focus prosodic pattern in Chicheŵa. In order to reconcile these seemingly contradictory experimental results, Downing and Pompino-Marschall proposed to regard the prosodic pattern in (42) as what they call *emphatic prosody*, which is optionally assigned when speakers would like to indicate narrow focus disambiguously. Suppose now that, as Downing and Pompino-Marschall claim, narrow and broad foci in Chicheŵa are prosodically indistinguishable *unless speakers adopt an option of assigning a prosodic pattern as in (42)*. Suppose further that permitting *broader* focus without making any extra prosodic effort is a default strategy Chicheŵa speakers generally adopt. It then is naturally expected that focus prosody is rarely and variably assigned to *wh*-questions in this language, as has been reported in the literature. Note now that the prosodic pattern used to unambiguously indicate narrow focus in Chicheŵa as in (42) resembles the focus prosody observed in Tokyo Japanese in (23), where the prosodic *wh*-domain starts with raised pitch on the *wh*-focus word and ends where the post-focal reduction stops.

The above investigation of (40i), (40iii) and (40iv) suggests that a general division of labor exists between prosody and displacement to the periphery in achieving a physical marking that is associated with the interpretive implementation of *wh*-questions.<sup>18</sup> This general picture is supported by the well-known observation that displaced *wh*-items themselves generally do not carry focus prominence in *wh*-movement languages (Ladd (1996: 170-172)). Accordingly, we predict that *wh*-in-situ is accompanied by some kind of distinctive prosody while overt *wh*-movement is not, even in the languages that permit both options like French and Brazilian Portuguese. These predictions appear to be upheld. Cheng and Rooryk (2000) argued that *wh*-in-situ in French obligatorily involves sentence-final rising intonation, which *wh*-movement does not. Déprez, et al. (2013) empirically verify this claim in their production experiment on prosodic patterns of *wh*-questions like (43)-(45) below.<sup>19</sup>

(43) *Wh*-movement with the question marker *est-ce que*:

**Quel élément** *est-ce qu'* elle a mis au milieu?  
**which shape** QUES.PRT she has placed in.the middle

'Which shape did she place in the middle?'

<sup>18</sup> Tentatively, I assume that *wh*-movement is a more marked strategy of physical marking than *wh*-prosody since it involves an extra process of relocating phonetic content to the periphery of a clause, while prosody is assigned to a sentence no matter what.

<sup>19</sup> Note that the French data discussed earlier in (33b) illustrates a fourth option, involving *wh*-movement with neither subject-aux inversion nor the question marker *est-ce que*. An anonymous reviewer points out the possibility "that the *wh*-fronted versions involve a *wh*-question of a topicalized sentence, in which case it is possible to analyze these examples as involving *wh*-in-situ example where the in-situ position is a topicalized position." However, all my French-speaking informants told me that the *wh*-questions involving movement, with or without subject-aux inversion (i.e. (33b), (45) and (44)) are accompanied by a falling contour, which suggests that no *wh*-in-situ is involved in (33b). At the same time, one informant (a native of the Québec dialect) did find it possible to assign an elevated high pitch to the *wh*-word itself and use an utterance-final rise, meaning the construction in question may be ambiguously analyzable. I leave the pursuit of this interesting topic to future research.

(44) *Wh*-movement with subject-auxiliary inversion:

**Quel élément** *a-t-elle* mis au milieu?  
**which shape** has.she placed in.the middle

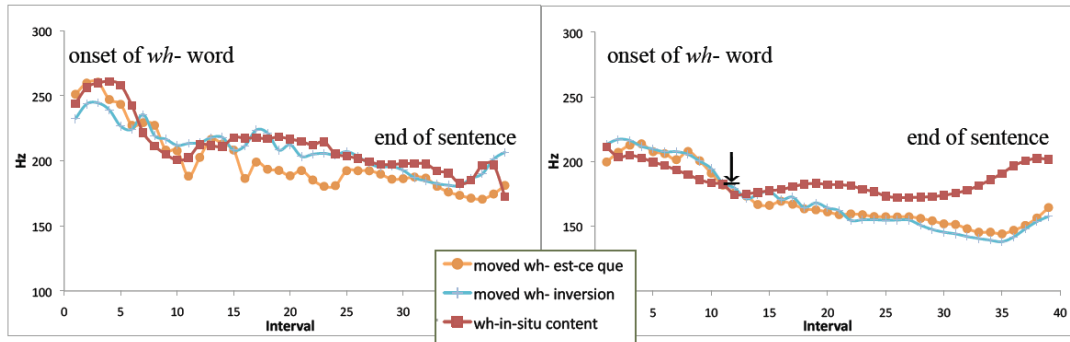
(45) *Wh*-in-situ:

Elle a mis **quel élément** au milieu?  
 she has placed **which shape** in.the middle  
 (literally) 'She placed which shape in the middle?'

Interestingly, the final rise was assigned in the *wh*-in-situ construction by most, but not all, the speakers who participated in their experiment.<sup>20</sup> Those who did not assign a final rise instead placed an elevated pitch on the *wh*-word itself. Déprez, et al. (2013: 14) illustrate the results of their experiment with the diagrams in (46), with the left and right panels representing the pitch contours for these two different sub-groups of participants. The three contours inside each plot correspond to the three sentence types in (43)-(45).

(46) a. High pitch accent on the *wh*-word:

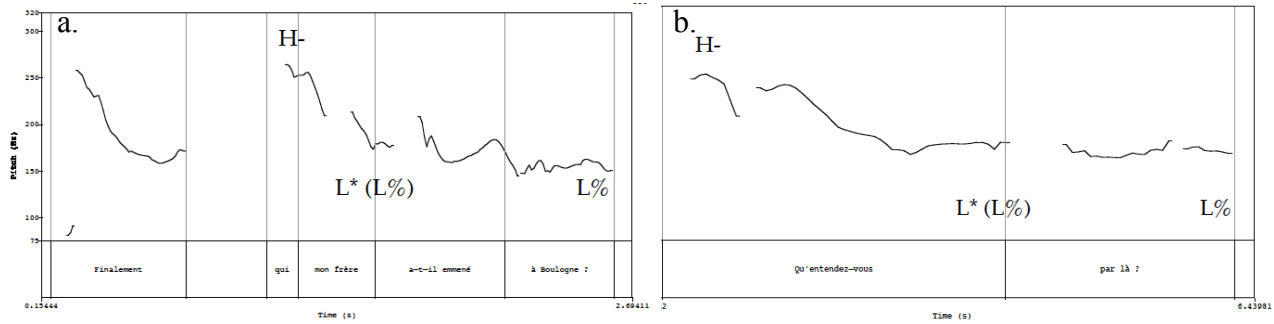
b. Clause-final rising contour:



Not only did Déprez, et al. (2013) find that different speakers choose between these two different strategies, but they also demonstrated that the extent of the final rise and the height of the pitch on the *wh*-word negatively correlate with each other. These two results suggest that the two patterns are likely to be variables of the prosody for *wh*-in-situ in French. Furthermore, Bayssade, et al. (2007: 167-8) observe that, in the *wh*-question accompanied by a falling contour, the elevated high pitch accent of the *wh*-word is followed by a low pitch accent (and one or more low boundary tones, according to their phonological analysis). This post-focal pitch lowering is illustrated by the pitch-track diagrams (47a-b) they provide and also by the diagram in (46a). (The *wh*-word in (47a-b) is assigned a phrasal H- in Bayssade, et al.'s (2007) analysis.)

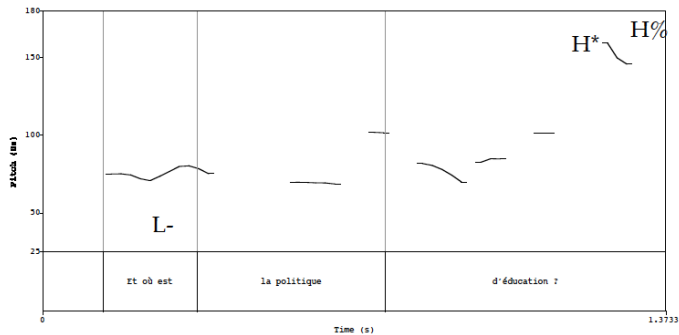
<sup>20</sup> Déprez, et al. (2012) report that for the speakers who did show a final rise in the *wh*-in-situ construction, the extent of the rise was systematically smaller than that observed in *yes-no* questions. This suggests that the *wh*-in-situ rise is, in a sense, distinctive to that in *wh*-questions.

(47)



Finally, when the sentence is assigned a clause-final rising contour as in (46b), the onset of the *wh*-word starts with low pitch, which Déprez, et al. (2013: footnote 9, p. 14) describe as "flat intonation or a compressed pitch accent" and Bayssade, et al. (2007: 168) analyze as involving a phrasal L-, as in (48).

(48)



To sum up, a *wh*-question is realized as *wh*-in-situ in French only when a distinctive prosodic pattern for a *wh*-question is assigned to it (either a raised pitch on the *wh*-word or a final rise, depending on the speaker). Otherwise, the *wh*-question is realized with the application of overt *wh*-movement.<sup>21</sup> Once again, since prosodic phrasing does not need to play any direct role in these analyses, we are not forced to assume that the two options of *wh*-questions in these languages are reduced to the presence versus absence of MiP boundaries.

When the prosodic analyses of *wh*-in-situ languages reported above are compared, a general picture emerges. In each case, a prosodic *wh*-domain is initiated with a *wh*-focus word and terminated at the end of the clause in which this *wh*-focus takes scope. In particular, a *wh*-focus

<sup>21</sup> One French informant tells me that, at least in his/her dialect of French, embedded *wh*-questions must always be represented with *wh*-movement. Another informant reports that *wh*-in-situ with subordinate scope is also an option in his/her dialect (Quebec French), which is accompanied by a final rise at the end of the subordinate CP with a pause following it.

My informant on Brazilian Portuguese also told me that the *wh*-in-situ necessarily involves a sentence-final rising contour (certainly not as an echo question) while overt *wh*-movement has an option of involving either rising or falling contour. He/She feels that the *wh*-movement with the final rise contour implies that the question is being asked as a preparatory question leading to a larger question while the *wh*-movement with a falling contour does not have such an implication. He/She also finds that an elevated high pitch accent on the *wh*-word itself (as used by some French speakers) is marginal at best.

word is marked by some local tonal event, and the end of the clause is marked by either a distinctive contour (e.g. a rise) or the termination of a stretch of low/high pitch. These findings are as summarized in (49).

(49) Prosodic patterns in *wh*-in-situ languages:

Language	Example	<i>wh</i> -word	End of CP
Tokyo Japanese	(35)-(36)	clear pitch prominence	end of low pitch sequence
Fukuoka Japanese	(38)	rising contour	end of high pitch sequence
Chichew̃a	(42)	some pitch prominence followed by a pause	end of low pitch sequence
French (rising)	(60a) (= (45))	compressed pitch	rising contour
French (falling)	(60b) (= (45))	clear pitch prominence	end of low pitch sequence

Exploring these patterns is a first step in responding to the need for examining much fuller data like (35)-(36) in languages other than Tokyo Japanese. These generalizations in (49) will be appealed to when we attempt to grammaticalize the sound-meaning synchronization in *wh*-questions in Section 3.2.4.1.

What remains to be accounted for is why rightward *wh*-movement as in (40ii) is not observed, at least in spoken languages.

(40ii) [CP ... **wh** ... **C**]      *wh*-move to right      ?  
           |\_\_\_\_\_↑

We can surmise the reason why this option is generally avoided as follows. Recall that it is being claimed here that overt *wh*-movement applies in quest of some form of physical marking associable with the interpretive aspects of *wh*-questions. While leftward overt *wh*-movement can successfully signal the involvement of a *wh*-focus (and its interpretive domain) at the beginning of a clause, rightward movement cannot encode such pieces of information until the very end of the clause. Such a delay of information imaginably creates a critical handicap when this kind of question sentence is processed. It therefore seems natural that languages should shy away from adopting the grammaticalization of such an inefficient way of physically marking *wh*-questions.

### 3.2. Grammaticalizing Sound-Meaning Correlations

In discussing typological variation in *wh*-questions in general, and discussing the prosodic disambiguation of potential *wh*-scope ambiguity in Japanese as in (35) and (36) in particular, we paid attention only to the surface correlations between *wh*-prosody and *wh*-scope. We also offered some informal generalizations and analyses to capture this observable surface correlation as if we were assuming that prosody directly derives semantic effect (or vice versa). We now begin a more serious investigation of how the grammar can achieve these surface correlations. If this investigation is pursued within the minimalist program, its goal can be restated as finding a

way to guarantee synchronization of a specific PF and a specific LF for a *wh*-question without giving rise to any theory/model-internal contradiction like that posed by the look-ahead problem.

### 3.2.1 Overt Movement as 'Look-ahead'

Before beginning this discussion, we first review some of the restrictions imposed on grammar by the core working hypotheses of the minimalist program. First, the input to the grammar should be nothing but the information encoded in lexical items ("Inclusiveness"). Second, the information in lexical items should be completely split so that each of the interface representations (PF and LF) consists solely of the information legible to the performance systems of sounds and meanings, respectively ("Legibility"). Third, syntactic derivation should be induced only by an interface need to derive legible PF and legible LF without involving any form of 'look-ahead' ("(Local) Economy"). These constraints imposed on grammar must always be observed in order for the minimalist program to be maintained properly.<sup>22</sup>

These fundamental requirements, however, have not always been met in the development of the theory of minimalist syntax. Overt movement, for example, has been characterized as a rule that applies before Spell-Out so that it can affect both PF and LF rather than LF alone. Note that this is a straightforward case of a look-ahead. In order to conceal this state of affairs, Chomsky (2000, 2001) postulates an EPP-feature, characterized as a 'virus that requires a spec' which must be eliminated before any larger constituent is created by Merge. In other words, movement is made overt at the expense of postulating an otherwise unmotivated imperfect entity that needs to be eliminated even before it reaches the interface. This approach directly disregards the local economy requirement mentioned above. Note also that, because of this tailor-made imperfection that has to be eliminated before Spell-Out, overt movement induces displacement effects at both PF and LF *accidentally*. In short, the whole approach here is simply a restatement of the problem rather than a solution.

By definition, since overt movement displaces phonetic content, it affects not only the semantics of a sentence but also its pronunciation. The source of the look-ahead problem just observed is the attempt to achieve this effect by forcing its application before Spell-Out, i.e., before the derivation reaches the interface components. Yet at this point in the derivation, there is no genuine grammatical motivation for such an operation. What the grammar needs to achieve, then, is to let overt movement affect sounds and meanings separately (in accordance with an interface need to derive a well-formed PF and a well-formed LF, respectively) yet somehow guarantee their synchronized effects.<sup>23</sup>

---

<sup>22</sup> In this article, the 'minimalist program' refers to a general program seeking "to discover to what extent minimal conditions of adequacy suffice to determine the nature of the right theory" (Chomsky (2000: 92)), pursued with the working hypotheses mentioned above. Crucially, the use of the term in this article does not refer to any particular mechanics or technical details Chomsky has adopted in pursuing this program, for example, postulation of specific functional categories like AGR or *v*, an appeal to a 'probe-goal relation' (or its predecessor 'feature checking') or overt Agree.

<sup>23</sup> Chomsky (2001: 5) also claims that Agree must apply (shortly) before Spell-Out since valued agreement features on the functional heads (as 'Probe') may provide phonetic effects at PF but cannot play any role at LF (and causes trouble being are therefore indistinguishable from the interpretable agreement features on the DP (as 'Goal')). These valued agreement features therefore must be eliminated from

### 3.2.2 Prosody-Semantics Correlations as 'Look-across'

Recall now the correlations between *wh*-prosody and *wh*-scope observed for Japanese in (35) and (36). If these remain mere observations, then it remains to be explicated how exactly the grammar makes possible such correlations. A common claim found in the literature is simply that a certain prosodic pattern is responsible for producing a specific semantic effect (or vice versa), but this claim provokes a problem of local economy in the grammar comparable to the 'look-ahead' required by overt movement. The only difference is that, in this case, since an LF is derived directly from a PF (or vice versa) skipping syntax, the prosody-semantics correlation involves 'look across' rather than 'look ahead'. The task that must be undertaken by the grammar in both cases is the same — it must somehow find a way to guarantee the synchronization of a specific PF effect and a specific LF effect while finding an independent interface motivation to establish each of them.

We would like to argue in the remainder of this article that these seemingly independent issues (the 'look-ahead' problem of overt movement and the 'look-across' problem of *wh*-in-situ) can be resolved in the same way, i.e. with an appeal to the same grammatical mechanisms. The key to the solution is to strictly observe the three minimalist constraints imposed on grammar mentioned above. First, we should satisfy Inclusiveness by appealing only to the information represented in lexical items. Second, we should satisfy Legibility by splitting this information completely into PF-relevant and LF-relevant pieces. Finally, we should satisfy Economy (both general and local) by achieving this process based solely upon interface needs.

### 3.2.3 Synchronizing and Splitting Sounds and Meanings

First, we will establish the synchronization of sounds and meanings in general by adopting a feature complex of the form  $[f_P, f_L]$ , where  $f_P$  is a feature relevant to PF and  $f_L$  to LF. The paired features  $[f_P, f_L]$ , which we call a 'PL-complex (physical/logical feature complex),' represent two different interface aspects of a single linguistic phenomenon. PL-complexes are added to lexical items, along with formal features like Case and  $\Phi$ -features, when a Numeration (or Lexical Subarray) is formed. For instance, when a Numeration is formed for the utterance in (50) below, various extra features (among others) are added to the lexical items, as indicated in (51).

(50) [As an answer to the question 'Who does John love?']

He loves **MARY**.

(51) N: {*he* (NOM), *loves* (PRES, 3P/SG), *Mary* (ACC, [**FOC<sub>P</sub>**, **FOC<sub>L</sub>**])}

Here, because of its focused status, the lexical head of the object  $N_{\max/\min}$  *Mary* is assigned the PL-complex  $[\text{FOC}_P, \text{FOC}_L]$ . This PL complex consists of two distinct types of features: a phonetically interpreted focus feature  $\text{FOC}_P$  and a semantically interpreted focus feature  $\text{FOC}_L$ .

---

narrow syntax and sent to PF by Spell-Out. This is another clear case involving of a look-ahead application of a syntactic operation, a problem that should and can be re-analyzed in a way similar to the account of overt movement to be sketched out in Section 3.2.4.2 below. The pursuit of this topic, however, goes beyond the scope of this article.

When a language user consciously or unconsciously decides what lexical items are to be used in generating an utterance, he or she also determines what informational role should be assigned to each of them in accordance with the appropriate information packaging strategy for a given context. This decision leads to the introduction of PL-complexes to particular lexical items. The PL-complex  $[FOC_P, FOC_L]$  was added to *Mary* in (51) in this way. The matter of what particular lexical items are selected into the Numeration is not determined by purely grammatical factors alone but by various extra-grammatical factors like register and style as well — as in the selection from *angry*, *mad* and *pissed off*. As such, we consider Numeration to be an interface between the computational component of the minimalist grammar and other cognitive systems. Likewise, information packaging, i.e., how we convey a message, rather than what we convey, is also determined by extra-syntactic factors like discourse and pragmatics. For these reasons, we consider Numeration to be the appropriate level for the introduction of PL-complexes.

The feature  $f_P$  eventually comes to be associated with some instruction to the performance system for sounds when it appears at PF, and the feature  $f_L$  eventually comes to be associated with some instruction to the performance system for meanings when it appears at LF. As such, the paired features  $[f_P, f_L]$  in PL-complexes are naturally bound to be completely split in the course of computation.<sup>24</sup> This means that no extra device or new hypothesis needs to be added to the standard minimalist assumptions in order to capture the synchronization of sounds and meanings. Simply put, Spell-Out splits the features on all lexical items into those relevant to PF and those relevant to LF and separately delivers them to the interfaces, and  $[FOC_P, FOC_L]$  are only some specific instances of such features.

The core idea of a PL-complex can be traced back at least to the syntactic focus marker "F" proposed by Jackendoff (1972: 240). Jackendoff's "F" and our PF-complexes, however, are distinct in two respects. First, "F" was claimed to be introduced by a syntactic rule in the course of a derivation (in particular, introduced to surface structure by an attachment transformation or to deep structure by a phrase structure rule), reflecting the Extended Standard Theory framework of late 1960s and early 1970s. PL-complexes, on the other hand, are added directly to lexical items at the outset of a syntactic derivation. Second, "F" is a single feature to be interpreted both phonetically and semantically, while PL-complexes consist of two distinct types of features which are separately interpreted at PF and LF. PL-complexes can be considered the minimalist reincarnation of "F," with the necessary adjustments required by the new theoretical assumptions of minimalism. Such adjustments allow PL-complexes to give us several clear advantages over "F" because they consist of, by definition, two independent features  $f_P$  and  $f_L$ . For instance, when we appeal to this property of PL-complexes, we can reduce cross-linguistic variation in the syntactic realization of *wh*-questions to the variation in the  $f_P$  of individual lexical items while maintaining the universality of the paired  $f_L$ . This point will be discussed in more detail directly below.

An anonymous reviewer questions the value of the proposed approach, claiming that what it achieves is "matched or exceeded by proliferation at the level of Numeration," and hence it falls in the situation described by Chomsky (1991: 13) where he points out that "[s]hifting the variety of devices from one to another component of grammar is no contribution to explanatory

---

<sup>24</sup> More specifically, they are split by the time they are sent to the interface representations for the satisfaction of their legibility requirements to be discussed below.



adequacy." On the contrary, as pointed out in two preceding paragraphs, an appeal to PL-complexes does not require any extra device or new hypothesis in minimalist syntax. Lexical items are nothing but a bundle of phonological and/or semantic features, to which formal features may be added, and all such features must be properly assorted and sent separately to PF and LF when the computation splits. As described with (51), PL-complexes are added to lexical items just as formal features like Case and  $\Phi$ -features are added when the Numeration is formed. Postulating a feature akin to a PL-complex in order to induce both phonetic and semantic effects of focus is not entirely new, as just portrayed above. Finally, as will be argued below, the proposed approach permits us to eliminate theory/model-internal contradictions like look-ahead and look-across problems, which otherwise would remain recalcitrant.

### 3.2.4 Interface Licensing

Up to this point, we have postulated that what starts out as a PL-complex [ $f_P, f_L$ ], i.e. a pair of P-feature and L-feature, comes to be separated in the course of derivation toward PF and toward LF. What is left to be achieved is to identify the role each of these features plays at the interface level. We consider PL-complexes to fulfill the role of guaranteeing that the linguistic expression they are assigned to comes to properly represent a specific linguistic concept (e.g., focus) both at PF and LF. In particular, the PF and the LF for a sentence must represent cues that can eventually be interpreted as appropriate instructions for the relevant performance system. When such interface cues are established, a linguistic expression can be said to become 'legible' at the interface — 'physically legible' at PF (henceforth 'P-legible') and 'logically legible' at LF (henceforth 'L-legible'). This way, PL-complexes permit us to maintain the core minimalist tenets (Inclusiveness, Legibility and (Local) Economy) while properly establishing the observed synchronization of sounds and meanings, thus solving the 'Look-across' problem.

When we adopt this view of interface licensing, we note that there is a fundamental similarity between the synchronization of 'prosody+semantics' and the synchronization of 'overt movement+semantics.' As such, it is practically useful to use 'overt syntax' to refer to both. We thus use the term overt syntax as a cover term to refer to *a grammatical procedure that achieves the synchronized PF- and LF-effects encoded by PL-complexes*. Under this new definition, the synchronization of *wh*-prosody and *wh*-semantics can be regarded as a product of overt syntax, just as the synchronization of *wh*-movement and *wh*-semantics is. Put reversely, overt movement also involves a type of PF-LF synchronization achieved by PL-complexes. In fact, all of prosody, overt movement, overt morphology, and possibly syntactic location (e.g. adjacency and periphery) can be regarded as properties that have potential to induce P-legibility in overt syntax. This is the motivation for the term 'physical' legibility rather than 'phonetic' legibility.<sup>25</sup>

---

<sup>25</sup> Yoon (2012) and Kitagawa and Yoon (2012) argue that the notions of P- and L-legibility can be made even more general and extended to many other aspects of overt syntax. For instance, they point out that the Visibility Condition (Joseph Aoun, Chomsky (1981: 117)) poses a typical 'look-across' problem in the minimalist framework since it claims to have captured the generalization that Case marking at PF makes an argument NP legible to  $\theta$ -marking at LF without clarifying how grammar can establish such a correlation. By regarding morphological case as one of the  $f_P$ s assigned to a nominal argument as part of a PL-complex, Yoon (2012) and Kitagawa and Yoon (2012) capture such a case- $\theta$  correlation as a synchronized PF-LF effect. They further argue that by regarding case/agreement morphology, prosody, adjacency, and peripherality as universally available options to establish P-legibility, seemingly unrelated



### 3.2.4.1 Overt Syntax with Prosody

We now examine the overt syntax of *wh*-questions for which P-legibility is fulfilled by prosody, thus resulting in *wh*-in-situ. This case represents the language types in (40i) and (40iv) (discussed in Section 3.1).

(40i) [CP ... **wh** ... C]      *wh*-in-situ      Japanese

(40iv) [CP C ... **wh** ...]      *wh*-in-situ      Chicheŵa

We hypothesize that the notion '*wh*-focus' is introduced into the Numeration as what we call '*wh*-C pair' (cf. Kitagawa and Rodríguez-Mondoñedo (2010), Kitagawa (2011)). A *wh*-C pair is a syntactic unit consisting of a pair of lexical items – a *wh*-word and a  $\text{Comp}_{\text{wh}}$  – and specified with a PL-complex of the form [ $\langle \text{wh}_P + C_P \rangle$ ,  $\langle \text{wh}_L + C_L \rangle$ ]. This is illustrated in (52) below.

(52) Japanese:     $\langle \text{nani} + \text{ka/no} \rangle$  ([ $\langle \text{wh}_P + C_P \rangle$ ,  $\langle \text{wh}_L + C_L \rangle$ ])  
                           what     $\text{COMP}_{\text{wh}}$

Chicheŵa:     $\langle \text{chiyáani} + \text{kodi} / \emptyset_{\text{wh}} \rangle$  ([ $\langle \text{wh}_P + C_P \rangle$ ,  $\langle \text{wh}_L + C_L \rangle$ ])  
                           what             $\text{COMP}_{\text{wh}}$

Note that a *wh*-C pair is 'paired' in two ways — it consists of a pair of lexical items (a *wh*-word and a  $\text{Comp}_{\text{wh}}$ ), and it is specified with a PL-complex (the P-features  $\langle \text{wh}_P + C_P \rangle$  and the L-features  $\langle \text{wh}_L + C_L \rangle$ ). By characterizing a *wh*-C pair this way, we make the following claim. At the time language users make the 'blueprint' of an utterance by forming a Numeration, they already encode the way *wh*-interrogation is incorporated into that utterance by indicating which item is interpreted as focus and in which projection it takes scope and is interpreted. That is, when a *wh*-word and its associate complementizer are introduced into the syntax, it is already specified how they must be represented at PF and at LF. The idea of encoding grammatical information as two independent elements that are associated as a single unit is not novel to generative syntax. For instance, in English, perfective aspect, progressive aspect, and the passive

---

empirical problems such as subject-object asymmetry in case drop in Korean as in (i) below (Ahn and Cho (2006)) and subject-object asymmetry in case adjacency in English as in (ii) can be uniformly captured.

(i) a. Subject: **Nwukwu**-{*ka* / \* $\emptyset$ } wuyu-lul      sass-ni?  
                           **who**-{**NOM** / \* $\emptyset$ }      milk-ACC      bought-Q

'Who bought milk?'

b. Object: YungHee-ka      **mwues**-{*ul* /  $\emptyset$ } sass-ni?  
                           YungHee-NOM      **what**-{**ACC** /  $\emptyset$ } bought-Q

'What did YungHee buy?'

(ii) a. Subject: **John probably** [<sub>I</sub> **has**] read the letter.

b. Object: \*John **read<sub>v</sub> carefully the letter**.

construction are often analyzed as one unit consisting of both the auxiliary verb and the verbal inflection (i.e., *have* + *-EN*, *be* + *-ING* and *be* + *-EN*, respectively).

The P-features  $\langle wh_P + C_P \rangle$  in languages of the type (40i) and (40iv) make the paired *wh*-word and  $Comp_{wh}$  become P-legible in the manner described in (53) below.

(53) P-legibility of *wh*-in-situ:

A *wh*-phrase and a  $Comp$  making up a *wh*-C pair become P-legible when their P-features  $[\langle wh_P + C_P \rangle]$  define a unique domain of prosody for focus (henceforth **FPd**) in such a way that:

- (i)  $[wh_P]$  physically marks the initiation of FPd, and
- (ii) the end of the maximal projection headed by  $[C_P]$  physically marks the termination of FPd.

It is in this way that the PF is realized for cases of *wh*-in-situ, as in (40i) and (40iv). The way FPd is phonetically implemented in such cases, however, varies from language to language (as exemplified in (49) above), though the implementation for any given language is presumably selected from the options made available by Universal Grammar. The most common pattern seems to involve indicating the *wh*-focus word with a distinctively high or low pitch, followed by a stretch of relatively level pitch that terminates at the end of CP (thus marking the end of FPd).

Independently of the licensing at PF, the *wh*-C pair is made 'L-legible' at LF in the manner described in (54).

(54) L-legibility of a *wh*-question:

A *wh*-phrase and a  $Comp$  making up a *wh*-C pair become L-legible when their L-features  $[\langle wh_L + C_L \rangle]$  define a unique domain of interpretation for focus in such a way that:

- (i)  $[wh_L]$  identifies the item to be interpreted as focus, and
- (ii) the maximal projection headed by  $[C_L]$  is identified as this item's scope domain.

We believe that the L-legibility of *wh*-questions is established in the same manner (as described in (54)) for both *wh*-in-situ languages and *wh*-movement languages.  $[Wh_L]$  can be considered an interpretable sub-feature that provides *wh*-focus content, while  $[C_L]$  is an uninterpretable sub-feature that gets deleted when its maximal projection comes to indicate the interpretive domain of focus. We will discuss how L-legibility can be implemented in covert syntax in both *wh*-in-situ and *wh*-movement languages in Section 3.2.4.3. As for the P-features,  $[Wh_P]$  in *wh*-in-situ languages can be considered an interpretable sub-feature that provides a phonological tone target that marks the initiation of FPd at PF. In contrast,  $[C_P]$  is an uninterpretable sub-feature that marks the termination of FPd.<sup>26</sup> This sub-feature is deleted when it marks the end of the post-focal pitch pattern at the end of the relevant maximal projection. Since  $[C_P]$  and  $[C_L]$  of a *wh*-C pair are uninterpretable sub-features, their failure to make the *wh*-C pair visible is expected to

---

<sup>26</sup> One possible exception is the  $[C_P]$  that is implemented as a clause-final rising contour in French *wh*-in-situ.

induce ungrammaticality. While [wh<sub>P</sub>] and [wh<sub>L</sub>] are interpretable sub-features, they must also play a role in making the *wh*-C pair legible at the interface by being associated with [C<sub>P</sub>] and [C<sub>L</sub>], respectively.<sup>27</sup> Such association will allow the focus prosody starting with a distinctively high or low pitch of a *wh*-word to be properly terminated, and will also allow the focus value of a *wh*-word (in the sense of Rooth (1992)) to be elevated to the ordinary semantic value.<sup>28</sup>

How visibility is implemented at PF and LF in a potentially ambiguous *wh*-question is exemplified for Tokyo Japanese in (55) and (56) and for Fukuoka Japanese in (57) and (58).<sup>29</sup> Observe how FPd at PF and a *wh*-focus scope domain at LF are aligned in each case when the visibility of the *wh*-question is established in accordance with (53) and (54).<sup>30</sup>

- (55) [CP<sub>1</sub> JYOn-wa [CP<sub>2</sub> MEarii-ga NA<sub>ni</sub>-o katTA-ka] Imademo siRITAGAtteiru-no]?  
 | John-TOP Mary-NOM **what**-ACC bought-COMP<sub>WTHR</sub> even.now want.to.know-COMP<sub>WH1</sub>  
 PF: | ↳ FPd-initial FPd-terminal ↙  
 LF: ↳ Focus scope domain ↳ *wh*-focus Head of focus scope domain ↙

(literally) 'What does John still want to learn *whether* Mary bought?' (= (35))

- (56) [CP<sub>1</sub> JYOn-wa [CP<sub>2</sub> MEarii-ga NA<sub>ni</sub>-o katTA-ka] ImademosiRITAGAtteiru-no]?  
 John-Top | Mary-Nom **what**-Acc bought-Comp<sub>WH2</sub> even.nowwant.to.know-Comp<sub>V/N</sub>  
 PF: | ↳ FPd-initial ↳ FPd-terminal  
 LF: Focus scope domain ↳ *wh*-focus ↳ Head of focus scope domain

'Does John still want to learn **what** Mary bought?' (= (36))

- (57) [CP<sub>1</sub> Naoya-wa [CP<sub>2</sub> Mariko-ga naN(I)-O KATTA-KA] WAKARAN-TO]?  
 | Naoya-Top Mariko-Nom **what**-Acc bought-Comp<sub>WTHR</sub> not.know-COMP<sub>WH1</sub>  
 PF: | FPd-initial FPd-terminal ↙  
 LF: ↳ Focus scope domain *wh*-focus ↙ Head of focus scope domain ↙

(literally) 'What does Naoya not know *whether* Mariko bought?' (Smith (2013: 119))

<sup>27</sup> When we adopt the Implicit Prosody Hypothesis (Fodor (1998)), we predict that the same requirement must be satisfied even in silent reading. See the references cited in footnote 13.

<sup>28</sup> At the same time, the post-focal materials located within FPd at PF presumably come to be regarded as the tail portion of the background of the focus at LF.

<sup>29</sup> In Fukuoka Japanese, an accent appears before the subordinate Comp when FPd terminates at the end of the subordinate CP. See Smith (2013) for a discussion on the variations in the prosody-scope correlations exhibited by young Fukuoka Japanese speakers.

<sup>30</sup> While LFs do not have prosodic patterns, prosody is nonetheless indicated in these and the following examples for ease of comparison between PF and LF.

- (58) [CP<sub>1</sub> Naoya-wa [CP<sub>2</sub> Mariko-ga naN(I)-O KATTA-ka wakaran-to]?  
 Naoya-Top | Mariko-Nom **what**-Acc bought-Comp<sub>wh2</sub> not.know-Comp<sub>v/N</sub>  
**PF:** ↓ **FPd-initial** ↙ **FPd-terminal**  
**LF:** **Focus scope domain** *wh-focus* ↙ **Head of focus scope domain**

'Does Naoya not know **what** Mariko bought?' (Smith (2013: 119))

In head-final languages like Japanese, FPd is terminated at Comp<sub>wh</sub>. Since this Comp<sub>wh</sub> is the head of the scope domain of the *wh*-focus word, the marking of the end of FPd at PF is even more clearly linked to the interpretive domain of the *wh*-focus at LF in Japanese than it is in Comp-initial *wh*-in-situ languages like Chicheŵa exemplified in (59).

- (59) [CP  $\emptyset$ <sub>CompWh</sub> A-na-mény-á NYUMBÁ || ndí mwáálá]?  
 | 1-SBJ-RECENT.PAST-hit **9.house** with 3.rock  
**PF:** | ↙ **FPd-initial** ↘ **FPd-terminal**  
**LF:** ↙ **Focus scope domain** ↘ **focus**

'S/he hit the **HOUSE** with a rock.'

Note that FPd as a whole at PF (e.g. *what* ~ Comp<sub>wh1</sub> in (55)) does not necessarily correspond to the focus scope domain at LF (e.g. CP<sub>1</sub> in (55)). Instead, the two are merely linked, with the endpoint of CP<sub>1</sub> functioning as their pivot. In this way, the proposed approach captures the prosody-interpretation synchronization between the unsynchronized PF and LF domains in *wh*-in-situ languages.

As we saw in Section 3.1, French permits two distinct types of FPd, which are illustrated in (60a) and (60b) below. (60a) involves a compressed pitch on the *wh*-word and an utterance-final rise (indicated by ↗), whereas (60b) involves clearly elevated pitch on the *wh*-word followed by a sequence of low pitch.

- (60) a. **PF<sub>1</sub>:** [CP  $\emptyset$ <sub>CompWh</sub> Elle a mis quel élément au milieu ↗]?  
 she has placed **which shape** in.the middle |  
 ↙ **FPd-initial** **FPd-terminal** ↘
- b. **PF<sub>2</sub>:** [CP  $\emptyset$ <sub>CompWh</sub> Elle a mis QUEL ÉLÉMENT au milieu]?  
 she has placed **which shape** in.the middle  
 ↙ **FPd-initial** **FPd-terminal** ↘

Both PFs in (60) can be paired with the LF in (61) below, whose L-legibility is achieved in accordance with (54).

- (61) **LF:** [CP  $\emptyset$ <sub>CompWh</sub> Elle a mis **quel élément** au milieu]?  
 | she has placed **which shape** in.the middle  
 ↙ **Focus scope domain** ↘ *wh-focus*  
 (literally) 'She placed which shape in the middle?'

To sum up so far, we can induce the synchronization of prosody and *wh*-interpretation observed in *wh*-in-situ languages by introducing a '*wh*-C pair' characterized by a PL-complex [ $\langle wh_P+C_P \rangle, \langle wh_L+C_L \rangle$ ] into syntax at the outset of the derivation. This PL-complex then becomes separated when the syntactic derivation splits toward PF and LF. At the respective interfaces,  $\langle wh_P+C_P \rangle$  and  $\langle wh_L+C_L \rangle$  are properly interpreted, thus making the linguistic expressions associated with them 'legible.' This approach effectively solves the 'look-across' problem of the prosody-semantics correlations pointed out in Section 3.2.2 above.

### 3.2.4.2 Overt Syntax with Displacement

We now examine the overt syntax of *wh*-questions in which P-legibility is fulfilled by displacement of the phonetic content of a *wh*-phrase (i.e., fulfilled by overt *wh*-movement). In this case, the (presumably uninterpretable) P-features  $\langle wh_P+C_P \rangle$  make the associated linguistic expressions P-legible in the manner described in (62) below. This gives rise to the language type in (40iii).<sup>31</sup>

(62) P-legibility of *wh*-movement:

A *wh*-phrase and a Comp making up a *wh*-C pair become P-legible when their P-features [ $\langle wh_P+C_P \rangle$ ] initiate a unique CP in such a way that [ $wh_P$ ] is located at the left periphery of the maximal projection of [ $C_P$ ].

(40iii) [ $_{CP}$  C ... **wh** ...]      *wh*-move to left      English/Tagalog  
   ↑\_\_\_\_\_|

This approach has a clear advantage over the EPP-based overt movement approach often adopted in minimalist syntax. Bošković (2007) points out that characterizing EPP as 'I need a Spec' would inevitably induce a 'look-ahead' problem (at least in Chomsky's phase approach, in which movement applies in a successively cyclic fashion). In (63) below, for instance, the Phase Impenetrability Condition would require *what* to have moved to the intermediate Spec-CP for further movement to matrix Spec-CP.

(63) [ $_{CP1}$  **What**<sub>1</sub> do-C<sub>1</sub> you think [ $_{CP2}$  **what**<sub>1</sub> that<sub>C</sub> Mary bought **what**<sub>1</sub>]]?  
   **EPP**    **EPP**

This also means that EPP must have been introduced under the subordinate C in (63). On the other hand, there are also cases like (64) below in which *wh*-movement cannot take place within the subordinate CP.

(64) \* [ $_{CP1}$  **Who**<sub>1</sub> C<sub>1</sub> **who**<sub>1</sub> thinks [ $_{CP2}$  **what**<sub>2</sub> that<sub>C</sub> Mary bought **what**<sub>2</sub>]]?  
   **EPP**    **EPP**

<sup>31</sup> As for why this does not also give rise to the language type in (40ii), recall that we speculated in Section 3.1 that rightward *wh*-movement is rejected as a viable option and the typological variety (40ii) is not attested at least in spoken languages.

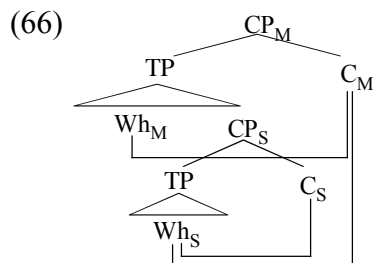
The introduction of EPP under the subordinate C in (64) would therefore incorrectly permit this sentence. Since EPP is only introduced for the subordinate C when the item in its Spec must move further to the matrix Spec-CP, a decision with 'look-ahead' would inevitably be needed. In the alternate approach proposed by Bošković (2007), rather than EPP being the 'I need to have a Spec' property of the target head, it should instead be regarded as the 'I need to be a Spec (of the target head)' property of the *moving* element. In our approach described in (62), the  $[wh_P]$  feature of the *wh*-object in (63) must keep moving until it lands in the vicinity of  $[C_P]$  of  $C_1$  and initiates  $CP_1$  in order to make the *wh*-C pair legible at PF. The  $[wh_P]$  feature, in other words, can function on a par with Bošković's 'I need to be a Spec' property. <sup>32</sup>

As stated above, we assume that the L-legibility of a *wh*-question is established uniformly as in (54), whether it involves *wh*-in-situ or *wh*-movement. Thus, the visibility of *wh*-movement in English is implemented at both PF and LF, as exemplified in (65).

- (65)  $[_{CP_1}$  I don't know  $[_{CP_2}$  **what**<sub>1</sub> C<sub>2</sub> she bought ~~**what**~~<sub>1</sub>]  
**PF:**  $\downarrow$  |  $\hookrightarrow$  **CP<sub>2</sub>-initial**  
**LF:** **Focus scope domain**  $\hookrightarrow$  ***wh*-focus**

### 3.2.4.3 Structural Condition on the Implementation of L-legibility and Subjacency

It seems clear that L-legibility in *wh*-in-situ languages must be implemented in covert syntax by appealing to the relative syntactic relation between the *wh*-word and the maximal projection of its associated  $Comp_{wh}$ . The examples we have examined thus far, e.g. (55) and (56), verify that both matrix CP ( $CP_M$ ) and subordinate CP ( $CP_S$ ) can serve as the scope domain of the subordinate *wh*-in-situ ( $Wh_S$ ) in a construction schematized in (66).



As is well-known, however, only  $CP_M$  can serve as the scope domain for the matrix *wh*-in-situ ( $Wh_M$ ). The L-legibility of a *wh*-C pair in Japanese (and possibly all *wh*-in-situ languages) thus seems to be implemented in logical syntax under the structural condition as in (67).

- (67)  $[Wh_L]$  is dominated by the maximal projection of  $[C_L]$ .

In *wh*-movement languages, on the other hand, L-legibility of a *wh*-C pair is implemented under the structural condition as in (68).

<sup>32</sup> Moreover, we can achieve this effect without having to assign any contradictory semantic characterization to a focus feature for moved *wh*-phrases and one for in-situ *wh*-phrases (as Bošković did).

(68) [ $Wh_L$ ] is located directly under the maximal projection of [ $C_L$ ].

One possible way to assimilate the two cases is to treat (68) as an effect that holds for not just *wh*-movement languages but also for *wh*-in-situ languages. *Wh*-movement would then have to take place in covert syntax to achieve L-legibility as in (68) and derive an LF as in (69).

(69) LF: [ $_{CPL} wh_L C_L [TP \dots wh_L \dots]$ ] (or [ $_{CPL} wh_L [TP \dots wh_L \dots] C_L$ ])

Since we have hypothesized that a *wh*-C pair (as a unit) represents a *wh*-focus construction, it might be reasonable to consider that a hierarchically-local union of the *wh*-word and  $Comp_{wh}$  at LF is a universal requirement. Here, we consider [ $C_L$ ] to be an uninterpretable feature that gets deleted when the union of the *wh*-word and  $Comp_{wh}$  is achieved and the interpretive domain of *wh*-focus is identified at LF. Alternatively, we may hypothesize that the L-legibility of a *wh*-C pair in *wh*-movement languages is also implemented as in (67) but involves the 'tail copy' [ $Wh_L$ ] within TP to be interpreted as a choice function variable (cf. Reinhart (1997)). We must, however, leave further pursuit of this topic to future research.

Finally, let us briefly discuss an issue of overgeneration which may arise under the proposed approach. One case that immediately comes to mind involves Subjacency violations in *wh*-movement languages. *Wh*-scope ambiguity detected by so many speakers of Tokyo Japanese as in (70)-(71) below, the availability of the matrix *wh*-scope interpretation in (70) in particular, demonstrates that the syntactic condition of Subjacency is in fact *not* violated in this sentence, contrary to what has been claimed in the literature (e.g. Nishigauchi (1990), Watanabe (1992)).

(70) [ $_{CP1}$  JYOn-wa [ $_{CP2}$  MEarii-ga [ $NA_{ni}$ -o katTA-ka] Imademo siRITAGAtteiru-no?  
 John-Top Mary-Nom **what**-Acc bought- $Comp_{wh}$ thr even.now want.to.know- $Comp_{wh}$   
 'What does John still want to learn *whether* Mary bought?' (= (55))

(71) [ $_{CP1}$  JYOn-wa [ $_{CP2}$  MEarii-ga [ $NA_{ni}$ -o katTA-ka] Imademo siRITAGAtteiru-no?  
 John-TOP Mary-NOM **what**-ACC bought-COMP $_{wh}$  even.now want.to.know-COMP $_{V/N-Q}$   
 'Does John still want to learn [**what**<sub>1</sub> Mary bought **t**<sub>1</sub> ]?' (= (56))

It remains unanswered, then, how Subjacency violations should be treated in *wh*-movement languages like English. An 'easy way out' is to posit that the Subjacency Condition constrains only the dislocation of phonetic content in overt syntax. Such an approach would inherit the essence of the claim made by Huang (1982), Lasnik and Saito (1984), Chomsky (1986) that overt movement is constrained by the Subjacency Condition while covert movement is not. An alternate possibility is that, as has been claimed by some researchers (e.g. Kluender and Kutas (1993)), what has been reported as Subjacency effects are actually not induced by grammatical violation but rather stem from extra-grammatical problems. Indeed, subjacency effects in simple cases are often observed to be less offending than the violation of more straightforward syntactic constraints. Moreover, subjacency effects are also known to fluctuate among distinct sentences and distinct speakers. Kitagawa and Fodor (2003), Kitagawa (2005a) and Kitagawa and Hirose (2012) examine potentially ambiguous *wh*-questions as in (70)-(71) in Japanese and argue that the matrix *wh*-scope interpretation for such sentences is multiply handicapped and hence is

dispreferred to the subordinate *wh*-scope interpretation, which they consider to have often been misattributed to Subjacency. Those extra-grammatical factors identified as the sources of such handicaps are listed in (72).

- (72) (i) The FPD assigned to the matrix *wh*-scope in (70) is more marked than that assigned to the subordinate *wh*-scope in (71), involving prolonged tonal monotony.
- (ii) The satisfaction of the presuppositions necessary for the matrix *wh*-scope interpretation from within an interrogative clause tends to require a more specific and elaborated pragmatic context than the subordinate *wh*-scope.
- (iii) Sentence processing involved in the matrix *wh*-scope interpretation would have to be established in defiance of the locality restriction imposed on the processing of *wh*-in-situ as discussed by Miyamoto and Takahashi (2002).
- (iv) Speakers and listeners may rely on distinct prosodic cues in their encoding/decoding of the matrix *wh*-scope interpretation, which can contribute to its difficulty. (Kitagawa and Hirose (2012))

It therefore is worth re-examining the subjacency effects induced by overt movement from a somewhat different angle, appealing to the insights obtained from the observations made in these studies before we draw any conclusion on this issue.<sup>33</sup>

Another complication arises in constructions consisting of multiple *wh*-foci. As illustrated in (73) below, two *wh*-words in distinct CPs can take the same scope in the higher CP when both of them are assigned pitch prominence, but they are not permitted to take distinct scope, as illustrated in (74).

(73)

DAre-ga	[MEarii-ga	NAni-o	eRAnda-ka]	oBOeteita-no?
who-Nom	Mary-Nom	what-Acc	chose-Comp <sub>thr</sub>	remembered-Comp <sub>wh</sub>

'Who remembered Mary had chosen what?'

(74)

#DAre-ga	[MEarii-ga	NAni-o	eRAnda-ka]	oBOeteita-no?
who-Nom	Mary-Nom	what-Acc	chose-Com <sub>wh</sub>	remembered-Comp <sub>wh</sub>

'Who remembered what Mary had chosen?'

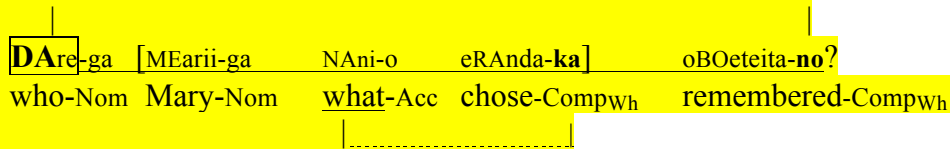
When the pitch of the subordinate *wh*-word is compressed, on the other hand, it may take subordinate scope but not matrix scope, as illustrated in (75)-(76).<sup>34</sup>

<sup>33</sup> See also Deguchi and Kitagawa (2002), Kitagawa (2005a) and Kitagawa (2006) for relevant discussion on Subjacency in Japanese and some related issues like the additional-*wh* effect and anti-superiority.

<sup>34</sup> The same is true when we add another subordinate *wh*-word (e.g. *naze* 'why') with compressed pitch.

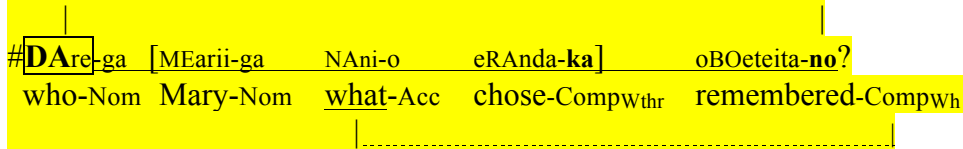


(75)



'Who remembered what Mary had chosen?'

(76)



'Who remembered Mary had chosen what?'

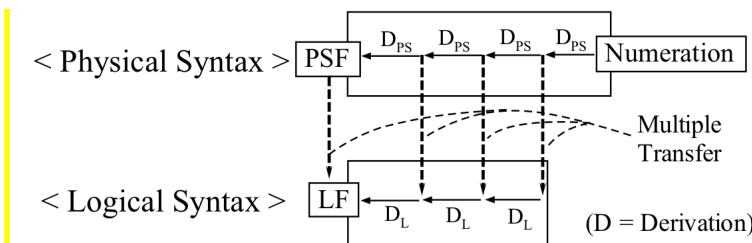
Ishihara (2002) attempts to capture the contrasts here through what he calls 'phonological intervention effects,' which arise when F<sub>0</sub> is assigned cyclically in each phase. Kitagawa (2007), on the other hand, regards them as problems arising from the failure to achieve the congruence of prosody and syntax in processing. Either of these two solutions, regardless of whichever may turn out to be correct, allow us to maintain the analysis proposed in this article.

### 3.2.5 Overt Syntax Revisited

Let us now return to the 'look-ahead' problem of overt movement pointed out in Section 3.2.1. The 'P/L-legibility' analysis of overt *wh*-movement sketched out above may be regarded advocating the view that overt *wh*-movement is a PF-movement that also induces synchronized LF-effects. This analysis effectively solves the look-ahead problem in question since physical (and hence overt) dislocation of phonetic content now takes place in the course of the derivation toward PF, and its application is motivated strictly by an interface requirement. While this approach can stand as a perfectly self-contained proposal, we can in fact take a step further and bring overt movement back into syntax with only small revisions of the minimalist model of grammar. The fact that the current minimalist model of grammar cannot achieve overt movement without inducing a look-ahead problem suggests, in itself, a need to redesign the model.

Let us therefore explore the alternative remodeling of the minimalist syntax illustrated in (77).

(77) Suggested Remodeling of Minimalist Syntax:



The crucial revision here is that **overt syntax (now called physical syntax) and covert syntax (now called logical syntax)** do not overlap. They are completely separate and operate in the following order. **Physical** syntax starts with the generation of linguistic expressions by (externally) merging the features encoded in lexical items and their projections. The goal of **physical** syntax is to derive a well-formed **physical form (PSF)**, at which the P-legibility of linguistic expressions must be achieved. An operation in **physical** syntax is enacted solely for this purpose, triggered by the  $f_P$  of a PL-complex. For example, a [ $Wh_P$ ] sub-feature assigned to a *wh*-word in English requires that word's maximal projection to keep moving to the periphery of a syntactic object each time merge applies. This process continues until it eventually reaches the left periphery of the CP headed by its associated Comp containing [ $C_P$ ].<sup>35</sup> This way, overt *wh*-movement applies in **physical** syntax without inducing any look-ahead problem. In a nutshell, **physical** syntax determines the overt/physical properties of syntactic expressions that are relevant to **PSF (and eventually to phonetics)**, such as the domain of prosodic/phonetic activities (e.g. FPD domain) and the linear and hierarchical order of the phonetic content of syntactic elements (e.g. **adjacency, displacement to periphery**).

At any derivational stage of **physical** syntax, any portion of the logical and semantico-pragmatic properties of lexical items (L-features) may be extracted away from P-features and fed into **logical** syntax 'as needed' for interpretation. This is achieved by multiple transfer, applying in the way proposed by Epstein, et al. (1998). Such a 'derivational' interpretation can induce, for instance, various LF-reconstruction effects.

This way, the **logical** syntactic operations in (77) may induce synchronized semantic effects, but this is due to the design of grammar, not because its application within **physical** syntax is triggered by LF factors. **Logical** syntax then attempts to derive a well-formed LF, at which L-legibility of linguistic expressions must be achieved. In short, **logical** syntax determines only the properties of syntactic expressions that are relevant to LF **(and eventually to semantics)**, such as the hierarchical relations and dependencies among syntactic constituents (e.g., the predicate-argument relation, the operator-variable relation and its scope).

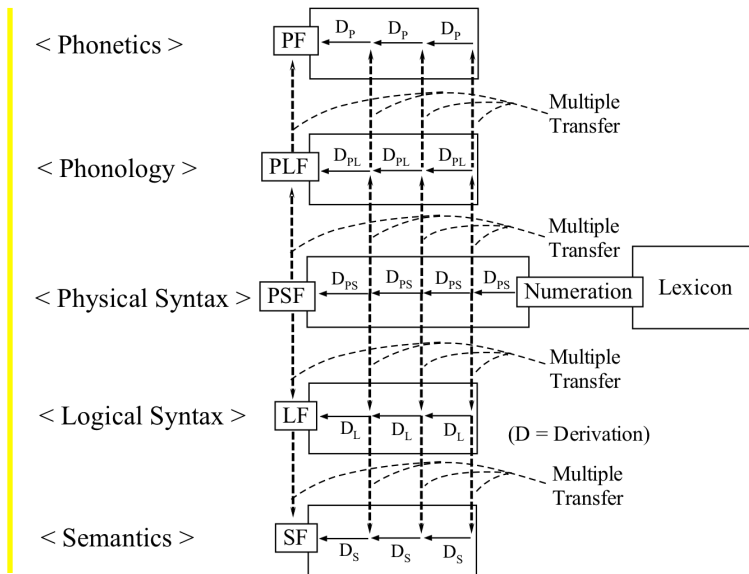
While the proposed reorganization of syntax may appear to be drastic at first sight, the revisions are in fact relatively small-scale. First, this reorganization has simply decomposed traditional overt syntax by untangling and separating its PF-effects and LF-effects, while permitting them to be synchronized with an appeal to PL-complexes. Second, multiple transfer merely applies in the opposite way to Spell-Out, stripping away L-features rather than P-features from the feature complexes of lexical items. If such small-scale revisions permit us to account for the synchronization of sounds and meanings while avoiding the serious theoretical problems

---

<sup>35</sup> *Wh*-movement is applying 'minimally' here in the way suggested by Takahashi (1994).  $Wh_P$  here also plays the same role as the 'I need to be a spec' *wh*-feature argued for by Bošković (2007) but without having to assign any contradictory semantic characterization to a focus feature for moved *wh*-phrases and one for in-situ *wh*-phrases. It remains unexplained, however, why such movement ever applies in the intermediate steps and lands  $Wh_P$  at the left periphery of a phrase that is *not* headed by [ $C_P$ ] after each application of merge. In other words, if *wh*-movement indeed applies cyclically (after each merge) rather than *in one fell swoop* to [ $C_P$ ], there must be a reason. One possibility is that a version of the "Order Preservation Constraint on Linearization" (Fox and Pesetsky (2005)) requires such movement in intermediate steps.

involving 'look-ahead' and 'look-across,' it is certainly worth exploring them. When we place the syntactic component sketched out in (77) in the model of grammar encompassing the components of phonology, semantics and phonetics, it will look like (78) below, in which phonological form (PLF) and the two representations perhaps directly interfacing with performance — phonetic form (PF) and semantic form (SF) — are derived.<sup>36</sup>

(78) Suggested Remodeling of Grammar:



Obviously, the full evaluation of the model of syntax in (77) and that of grammar in (78) will require much future research.<sup>37</sup>

3.3. Summary of Section 3:

In this section, we tackled the research project Richards initiated in his highly stimulating monograph from a slightly different angle. Pointing out that both *wh*-in-situ and overt *wh*-movement capture sound-meaning correlations by appealing to some form of physical surface marking, we proposed to regard them both as instances of overt syntax (which was redefined as a grammatical procedure to synchronize PF- and LF-effects). We postulated a '*wh*-C pair' specified with a PL-complex of the form [ $\langle wh_p + C_p \rangle, \langle wh_L + C_L \rangle$ ] as a grammatical mechanism to induce the legibility of a *wh*-focus construction separately at PF and LF. This approach enabled us to solve what we called 'look-across' problem posed by the prosody-semantics correlations observed in *wh*-in-situ as well as the 'look-ahead' problem posed by overt *wh*-movement. This approach also frees us from the various potential problems that arise in the 'prosodic boundary'

<sup>36</sup> Note that, up until now, we have loosely referred to PSF as PF.

<sup>37</sup> It should be made clear that (77) and (78) are proposed as models of competence, *not* as acquisition models. It is also assumed that both production and perception are performed based upon this model of grammar (with the directions of the arrows observed in both cases), as proposed by Kitagawa and Ueyama (2004), which was elaborated on by Kitagawa (2005b) and extensively pursued by Ueyama (2009).

approach proposed in Richards' monograph, thereby permitting us to strictly maintain the major tenets of the minimalist program. Toward the end, we also explored a possible reorganization of the model of minimalist syntax and grammar in which overt movement applies in syntax rather than at PF.

## References

- Ahn, Hee-Don and Sungeun Cho (2006) "Unpronounced Case Markers and Apparent Subject-Object Asymmetry," *Studies in Modern Grammar* 43, 55-80.
- Arregi, Karlos (2002) *Focus on Basque Movements*, Doctoral dissertation, MIT.
- Bayssade, Claire, Elisabeth Delais-Roussarie and Jean-Marie Marandin (2007) "The prosody of interrogatives in French," *Nouveaux Cahiers de Linguistique Française* 28, 163-175.
- Bošković, Željko (2007) "On the Locality and Motivation of Move and Agree: An Even More Minimal Theory," *Linguistic Inquiry* 38.4, 589-644.
- Cecchetto, Carlo, Carlo Geraci and Sandro Zucchi (2009) "Another Way to Mark Syntactic Dependencies: The Case for Right-peripheral Specifiers in Sign Languages," *Language* 85.2, 278-320.
- Cheng, Lisa Lai-Shen and Johan Rooryk (2000) "Licensing wh-in-situ," *Syntax* 3.1, 1-19.
- Chomsky, Noam (1981) *Lectures on Government and Binding*, Foris Publications, Dordrecht.
- Chomsky, Noam (1986) *Barriers*, MIT Press, Cambridge, MA.
- 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, The MIT Press, Cambridge, Massachusetts.
- Chomsky, Noam (2001) "Derivation by Phase," *Ken Hale: A Life in Language*, ed. by Michael Kenstowicz, 1-52, MIT Press, Cambridge, MA.
- Deguchi, Masanori and Yoshihisa Kitagawa (2002) "Prosody and Wh-questions," *Proceedings of the Thirty-second Annual Meeting of the North-Eastern Linguistic Society*, 73-92.
- Déprez, Viviane, Kristen Syrett and Shigeto Kawahara (2013) "The interaction of syntax, prosody, and discourse in licensing French wh-in-situ questions," *Lingua 124 Special Issue Prosody at the Grammatical Crossroads – Japanese and Beyond*, 4-19.
- Downing, Laura (2005) "The Prosody of Focus-related Enclitics in Some Southern Bantu Languages," Handout for talk given at SOAS.
- Downing, Laura, J. (2011) "Wh-Questions in Chewa and Tumbuka: Positions and Prosodies," *Questions in Bantu Languages: Prosodies and Positions, ZAS Papers in Linguistics* 55, 23-46.
- Downing, Laura, Al Mtenje and Bernd Pompino-Marschall (2004) "Prosody and Information Structure in Chichewa," *ZAS Papers in Linguistics* 37, 167-186.
- Downing, Laura and Bernd Pompino-Marschall (2013) "The focus prosody of Chichewa and the Stress-Focus constraint: a response to Samek-Lodovici (2005)," *Natural Language & Linguistic Theory* Online First Article, 1-35.
- Elordieta, Gorka (1997) "Accent, Tone and Intonation in Lekeitio Basque," *Issues in the phonology and morphology of the major Iberian languages*, ed. by Fernando Martinez-Gil and Alfonso Morales-Front, Georgetown University Press, Washington, DC.
- Embrick, David and Rolf Noyer (2001) "Movement Operations after Syntax," *Linguistic Inquiry* 32, 555-595.
- Epstein, Samuel David, et al. (1998) *A Derivational Approach to Syntactic Relations*, Oxford University Press, New York.

- Fodor, Janet Dean (1998) "Learning to Parse?," *Journal of Psycholinguistic Research* 7, 285-318.
- Fox, Danny and David Pesetsky (2005) "Cyclic Linearization of Syntactic Structure," *Theoretical Linguistics — Special Issue on Object Shift in Scandinavian*, ed. by É. Kiss, Katalin, 31.1-2, 1-45.
- Halle, Morris and Alec Marantz (1993) "Distributed Morphology and the Pieces of Inflection," *The View from Building 20*, ed. by Kenneth Hale and Samuel Jay Keyser, 111-176, MIT Press, Cambridge, Massachusetts.
- Hayes, Bruce and Aditi Lahiri (1991) "Bengali Intonational Phonology," *Natural Language and Linguistic Theory* 9, 47-96.
- Huang, C. -T. James (1982) *Logical Relations in Chinese and the Theory of Grammar*, Doctoral dissertation, Massachusetts Institute of Technology.
- Igarashi, Yosuke and Yoshihisa Kitagawa (2007) "Focus and Monotony," paper presented at Workshop on Prosody, Syntax and Information Structure III.
- Ishihara, Shinichiro (2002) "Syntax-Phonology Interface of Wh-Constructions in Japanese," *The Proceedings of the Third Tokyo Conference on Psycholinguistics*, 165-189.
- Ishihara, Shinichiro (2003) *Intonation and Interface Conditions*, Doctoral dissertation, MIT.
- Ishihara, Shinichiro (2011) "Japanese Focus Prosody Revisited: Freeing Focus from Prosodic Phrasing," *Lingua* 121, 1870–1889.
- Kanerva, Jonni (1989) *Focus and Phrasing in Chichewa Phonology*, Doctoral dissertation, Stanford University.
- Kayne, Richard (1994) *The Antisymmetry of Syntax*, MIT Press, Cambridge, MA.
- Kitagawa, Yoshihisa (2005a) "Prosody, Syntax and Pragmatics of Wh-questions in Japanese," *English Linguistics*, 22.2, 302-346.
- Kitagawa, Yoshihisa (2005b) "Symposium on Prosody and Syntax: An Overview," *English Linguistics*, 22.2, 299-301.
- Kitagawa, Yoshihisa (2006) "Naze," *In Search of the Essence of Language Science: Festschrift for Professor Heizo Nakajima on the Occasion of his Sixtieth Birthday*, ed. by Yubun Suzuki Keizo Mizuno and Kenichi Takami, 101-120, Hitsuji Shobo, Tokyo.
- Kitagawa, Yoshihisa (2007) "When We Fail to Question in Japanese," *Interdisciplinary Studies on Information Structure 9: Proceedings of the 2nd Workshop on Prosody, Syntax and Information Structure (WPSI 2)*, ed. by Shinichiro Ishihara, 61-96, University of Potsdam, Potsdam.
- Kitagawa, Yoshihisa (2011) "Decomposing Overt Syntax," *Japanese/Korean Linguistics* 19, 61-80.
- Kitagawa, Yoshihisa and Janet Dean Fodor (2006) "Prosodic Influences on Syntactic Judgments," *Gradience in Grammar: Generative Perspectives*, ed. by Gisbert Fanselow, et al., 336-358, Oxford University Press, Oxford, UK.
- Kitagawa, Yoshihisa and Yuki Hirose (2012) "Appeals to Prosody in Japanese Wh-interrogatives — Speakers' versus Listeners' Strategies," *Lingua* 608-641.
- Kitagawa, Yoshihisa and Miguel Rodríguez-Mondoñedo (2010) "When Syntax Must Become Overt," paper presented at New Horizons in the Minimalist Program — SyntaxFest 2010, Indiana University.
- Kitagawa, Yoshihisa and Ayumi Ueyama (2004) *Seisei-bunpou-no Kangae-kata (The Ways of Thinking in Generative Grammar)*, Kenkyu-sha, Tokyo.
- Kitagawa, Yoshihisa and Junghyoe Yoon (2012) "Case Reincarnated," paper presented at The Seventh International Workshop on Theoretical East Asian Linguistics.

- Kluender, Robert and Marta Kutas (1993) "Subjacency as a Processing Phenomenon," *Language and Cognitive Processes* 8, 573-633.
- Kubo, Tomoyuki (1989) "Fukuoka-shi-hoogen-no dare, nani-too-no gimon-shi-o fukumu bun-no pittipataan (The pitch patterns of sentences containing the interrogatives such as who/what in the Fukuoka-city dialect.)," *Kokugo-gaku* 156, 71-82.
- Kuno, Susumu (1982) "The Focus of the Question and the Focus of the Answer," *Papers from the Parasession on Nondeclaratives, Chicago Linguistics Society*, 134-157.
- Ladd, Robert (1996) *Intonational Phonology*, Cambridge University Press, Cambridge.
- Lasnik, Howard (To appear) "Multiple Sluicing in English?," *Syntax* 16.4,
- Lasnik, Howard and Mamoru Saito (1984) "On the Nature of Proper Government," *Linguistic Inquiry* 15, 235-289.
- Maekawa, Kikuo (1991) "Perception of Intonation Characteristics of WH and non-WH Questions in Tokyo Japanese," *Proceedings of the XXIIInd International Congress of Phonetic Science* 4, 202-205.
- Maekawa, Kikuo (1994) "Is There 'Dephrasing' of the Accentual Phrase in Japanese?," *OSU Working Papers in Linguistics* 44, 146-165.
- Myers, Scott (1996) "Boundary Tones and the Phonetic Implementation of Tone in Chichewa," *Studies in African Linguistics* 25.1, 29-60.
- Nishigauchi, Taisuke (1990) *Quantification in the Theory of Grammar*, Kluwer, Dordrecht.
- Nissebaum, Jon (2000) *Investigations of Covert Phrase Movement*, Doctoral dissertation, Massachusetts Institute of Technology.
- Pesetsky, David (1998) "Some Optimality Principles of Sentence Pronunciation," *Is the Best Good Enough?*, ed. by Martha Barbosa, et al., 337-383, MIT Press, Cambridge, MA.
- Pierrehumbert, Janet and Mary Beckman (1988) *Japanese Tone Structure*, The MIT Press, Cambridge, Massachusetts.
- Pires, Acrisio and Heather Taylor (2007) "The syntax of wh-in-situ and common ground," *Proceedings of the 37th LSRL*,
- Reinhart, Tanya (1997) "Quantifier Scope: How Labor Is Divided between QR and Choice Functions," *Linguistics and Philosophy* 20, 335-397.
- Richards, Norvin (2010) *Uttering Trees*, MIT Press, Cambridge, MA.
- Rizzi, Luigi (1997) "The Fine Structure of the Left Periphery," *Elements of Grammar: Handbook in Generative Syntax*, ed. by Liliane Haegeman, 281-337, Kluwer, Dordrecht.
- Rooth, Mats (1992) "A Theory of Focus Interpretation," *Natural Language Semantics* 1, 75-116.
- Selkirk, Elisabeth and Koichi Tateishi (1988) "Constraints on Minor Phrase Formation in Japanese," *Papers from the Twenty-fourth Regional Meeting of the Chicago Linguistic Society*, 316-336.
- Selkirk, Elisabeth and Koichi Tateishi (1991) "Syntax and Downstep in Japanese," *Interdisciplinary Approaches to Language*, ed. by Carol Georgopoulos and Roberta Ishihara, 519-543, Kluwer, Dordrecht.
- Shinya, Takahito Elisabeth Selkirk and Shigeto Kawahara (2004) "Rhythmic Boost and Recursive Minor Phrase in Japanese," *Proceedings of the Second International Conference on Speech Prosody*, 183-186.
- Smith, Jennifer L. (2005) "On the WH-Question Intonational Domain in Fukuoka Japanese: Some Implications for the Syntax-Prosody Interface," *Papers on Prosody, UMOP*, ed. by Shigeto Kawahara, 219-237, GLSA, Amherst, MA.

- Smith, Jennifer L. (2013) "Fukuoka Japanese wh prosody in production and perception," *Lingua* 124 *Special Issue Prosody at the Grammatical Crossroads – Japanese and Beyond*, 96-130.
- Truckenbrodt, Hubert (1999) "On the Relation between Syntactic Phrases and Phonological Phrases," *Linguistic Inquiry* 30.2, 219-255.
- Ueyama, Ayumi (2009) "Model of Judgment Making and Hypotheses in Generative Grammar," *Japanese/Korean Linguistics* 17, 27-47.
- Wachowicz, Krystyna (1978) "Q-morpheme Hypothesis, Performative Analysis and an Alternative," *Questions*, ed. by Henry Hiz, 151-164, Reidel, Dordrecht.
- Watanabe, Akira (1992) "Subjacency and S-structure Movement of WH-in-situ," *Journal of East Asian Linguistics* 1, 255-291.
- Yoon, Junghyoe (2012) *Case Drop in Korean - Its Empirical and Theoretical Investigation*, Doctoral dissertation, Indiana University.
- Zubizarreta, Maria (1998) *Prosody, Focus, and Word Order*, The MIT Press, Cambridge, Massachusetts.