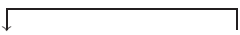


3 Beyond Strength and Weakness

3.1 Introduction

The synonymous sentences in (1) illustrate a classic problem in syntax: some languages perform *wh*-movement overtly, while others do not:

- (1) a.  **What** did John buy ___ ?
b. John-wa **nani**-o katta? (Japanese)
John TOP what ACC bought

Throughout, I will refer to the option in (1b) as “covert movement,” but in fact nothing I will say here will hinge crucially on the correct representation of this type of example. Much fruitful work has concentrated on how exactly to characterize the difference between (1a,b): should we understand Japanese as having roughly the same syntax for *wh*-questions as English, with a type of movement masked by some difference in the mapping of syntax onto phonology? or should we posit a different syntax for Japanese *wh* in situ, with a correspondingly different semantics for *wh*-words that allows them to be interpreted without movement?

While some progress has been made on these questions, comparatively little research has focused on the question of why languages differ in this way. The answer to this question that current theories standardly offer make the difference a parameter, something unpredictable about each language that must be learned by the child: in Minimalism, we speak of languages having “strong” or “weak” *wh*-features, or (more recently) of C having, or lacking, an EPP feature.

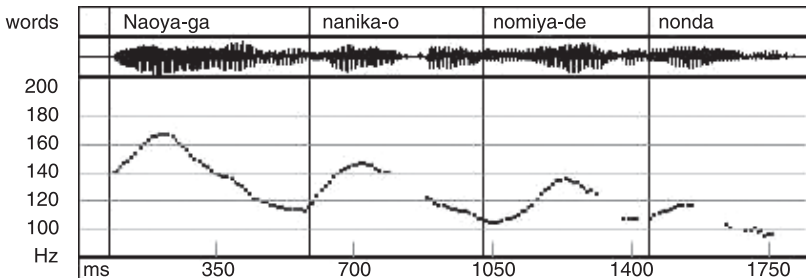
In this type of theory, the overt/covert distinction for *wh*-movement cannot be explained; it is simply stipulated, without following from anything else. Of course, this could turn out to be the right approach. In this

chapter I will try, nevertheless, to find a deeper explanation; the goal here will be to predict whether a given language has *wh*-movement or *wh* in situ (or both). The proposal will be that the overt/covert distinction is indeed predictable from independently observable properties of languages; in particular, we can predict what a language will do with its *wh*-phrases from the position of its complementizer (particularly, the complementizer associated with *wh*-questions) and the nature of its mapping of syntactic structure onto prosody.

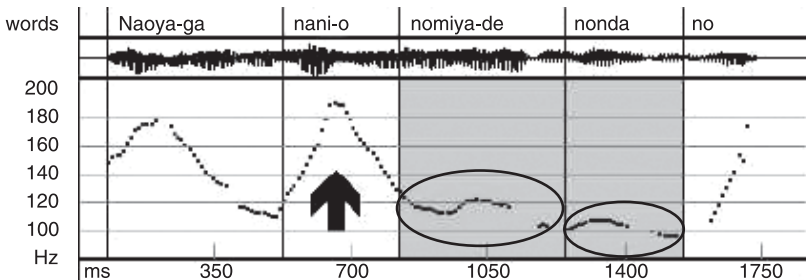
3.1.1 Japanese *wh*-Prosody

The proposal offered here is inspired by much recent work on the prosody of Japanese *wh*-questions (see Deguchi and Kitagawa 2002, Ishihara 2003, Sugahara 2003, Smith 2005, Hirotsu 2005, and the references cited there). Pitch tracks for a Japanese statement, and a corresponding *wh*-question, are given in (2) (from Ishihara 2003, 53–54):

- (2) a. Naoya-ga nanika-o nomiya-de nonda (Japanese)
 Naoya-NOM something-ACC bar-LOC drank
 ‘Naoya drank something at the bar’



- b. Naoya-ga nani-o nomiya-de nonda no?
 Naoya-NOM what-ACC bar-LOC drank Q
 ‘What did Naoya drink at the bar?’



The pitch tracks in (2a) and (2b) differ in two ways. First, the *wh*-word direct object in (2b) has its pitch boosted; compare the lower pitch of the direct object in the statement in (2a). Second, there is a domain, starting with the *wh*-phrase and ending with the *wh*-complementizer (shaded in the pitch track in (2b), which is characterized by pitch compression: the peaks in this domain (circled) are lower than they would normally be.

Japanese *wh*-questions, then, involve a prosodic domain of some type which starts with the *wh*-phrase and ends with the complementizer. The proposal being defended here will be that all languages are attempting to do this; every language tries to create a prosodic structure for *wh*-questions in which the *wh*-phrase and the corresponding complementizer are separated by as few prosodic boundaries as possible. How languages achieve this varies from language to language, depending on where the complementizer is and on what the basic rules for prosody are.

Schematically, then, the proposal is this. Suppose we have an expression in which a *wh*-phrase and its corresponding complementizer are separated by prosodic boundaries, as in (3):

(3) C [_φ] [_φ] [_φ] *wh*]

There are two ways of satisfying the universal condition on *wh*-prosody being proposed here. One is to change the prosody of (3), creating a prosodic domain in which C and *wh* are not separated by prosodic boundaries:

(4) [C *wh*]

As we will see, the option in (4) is available for some languages but not for others, and the distinction is predictable on the basis of independently observable properties of prosody. Another way of altering the structure in (3) to make it prosodically acceptable is to move the *wh*-phrase, so that it is closer to the C, in a position where no prosodic boundaries intervene between C and *wh*:

(5) [**wh** C [_φ] [_φ] [_φ] ~~*wh*~~]

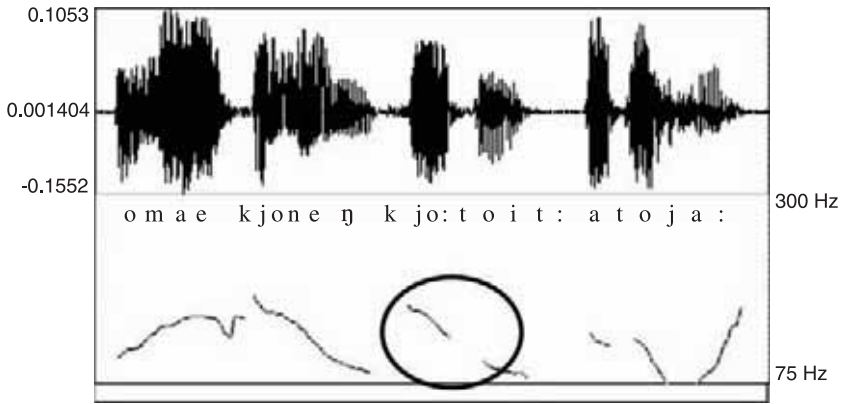
The examples in (4) and (5) represent covert and overt movement, respectively.

At this point, two comments are in order. The first is that throughout this chapter I will make very unorthodox assumptions about the interaction between the syntax and the phonology; as we have just seen, the idea will be that the syntactic operation of *wh*-movement takes place just in

case the prosody requires it. The approach therefore involves a straightforward type of look-ahead.¹ We have the usual array of mechanisms for avoiding this problem: for example, we could allow the syntax to choose freely whether to move or not, or have the syntax create multiple copies in all cases, with the phonology acting as a filter ruling out certain derivations or choices of copy pronunciation. Alternatively, we could grant the syntax some way of knowing “in advance” certain facts about the phonological representation. Yet another option would be to simply keep our existing mechanisms for forcing overt and covert movement; the theory developed here would simply constrain the possible distributions of strong and weak features. One option which we can eliminate at the outset, I think, would be to make *wh*-movement a PF operation, taking it out of the syntax altogether. While this would solve the look-ahead problem, I think the evidence that *wh*-movement is syntactic is quite overwhelming. Choosing among the remaining options is not at all straightforward, however. For most of what follows I will simply ignore the issue, commenting on it only occasionally, as the theory is fleshed out.

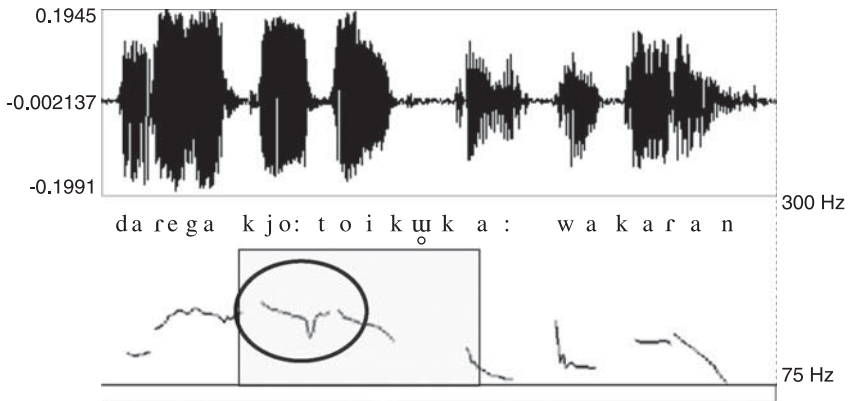
The other comment has to do with the nature of the prosodic domain that we see in *wh*-questions in some languages (the example given above was from Japanese). The theory here will crucially constrain the distribution of prosodic boundaries, but it will have nothing to say about how these prosodic boundaries are realized as conditions on the rise and fall of pitch. In Japanese, as we have seen, the “*wh*-domain” is characterized by pitch compression, but there is no reason to expect this to be universal. In fact, we can see that it is not universal, without even leaving Japan. The pitch tracks discussed above were from Tokyo Japanese, but as Smith (2005) discusses, the facts are quite different in Fukuoka Japanese. Like Tokyo Japanese, Fukuoka Japanese has a special prosodic domain connecting *wh*-phrases with the complementizers where they take scope, but in Fukuoka Japanese the relevant prosodic domain is associated not with pitch compression but with a high tone. Pitch tracks for a non-*wh*-question and a *wh*-question are given in (6):

- (6) a. Omae kyonen Kyoto itta to ya? (Fukuoka Japanese)
 you last.year Kyoto went NLIZER COP
 ‘Did you go to Kyoto last year?’



Total duration 2.144825 seconds

- b. Dare-ga Kyooto iku ka wakaran.
 who-NOM Kyoto go Q know-NEG
 'I don't know who's going to Kyoto'



Total duration 2.218934 seconds

The pitch track for the word *Kyooto* 'Kyoto' is circled in both examples, and the *wh*-domain is shaded in (6b). As the pitch tracks show, *wh*-questions in Fukuoka Japanese involve not pitch compression but a high tone, starting at the beginning of the *wh*-domain and decaying somewhat toward the end. In the non-*wh*-question in (6a), *Kyooto* exhibits a dramatic fall, while in (6b), *Kyooto* is comparatively level and high.²

Thus, the claim being defended here is specifically related to the distribution of prosodic boundaries; as we will see, the claim will be that some but not all languages are capable of creating a "*wh*-domain" that captures the *wh*-phrase and the associated complementizer in a single

domain, and these are the languages that can have *wh* in situ. What kind of effect these *wh*-domains have on pitch is not part of the theory: *wh*-domains might involve pitch compression, a high tone, or (in principle) no prosodic effects at all.³ Similarly, we will see examples in which the complementizer that represents one edge of the *wh*-domain is phonologically null; again, the theory developed here is concerned with phonological representations rather than with phonetic effects.

3.2 Prosody and *wh*-Prosody

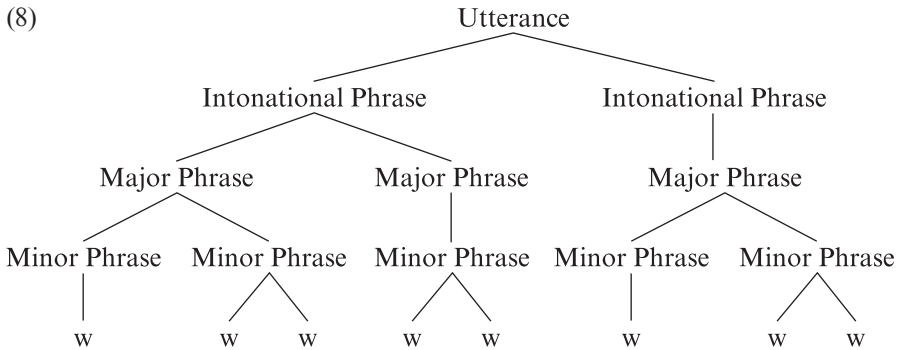
In order to understand why some but not all languages can derive the universally required prosody for *wh*-questions without moving the *wh*-phrase, we will first need to consider the conditions on prosody, and understand the ways in which mappings from syntax to prosody can differ from language to language.

Following much work on the syntax-phonology interface (see, for example, Selkirk 1984, Nespor and Vogel 1986, Truckenbrodt 1995, Wagner 2005, and much other work), I will assume that prosodic representations are constructed by mapping certain syntactic boundaries onto prosodic boundaries. For instance, we might have a language in which the Left edge of every DP is associated with a prosodic domain boundary. An SOV sentence in a language of this kind is schematically represented in (7a), and the corresponding prosodic structure is given in (7b):

- (7) a. [TP (DP D NP) [VP (DP D NP) V]]
 b. (DP D NP) (DP D NP V)

In (7), the Left edges of DPs (circled) are mapped onto prosodic boundaries, yielding a structure with two prosodic domains: the first consists entirely of the first DP, and the second of the second DP and the following verb.

(7b) shows the lowest level of phonological phrasing (what is sometimes called the *Minor Phrase* in the literature on prosody). Much work on prosody agrees that there are a number of domains of different sizes, which may be hierarchically organized, with *Minor Phrases* combining to form larger phrases (sometimes called *Major Phrases*), which are sometimes claimed to group together into *Intonational Phrases*, which in turn combine to form the Utterance. Selkirk's (1986, 1995) *Strict Layer Hypothesis* proposes that each of these levels of hierarchical phonological structure is always completely decomposable just into units of the next lower level:

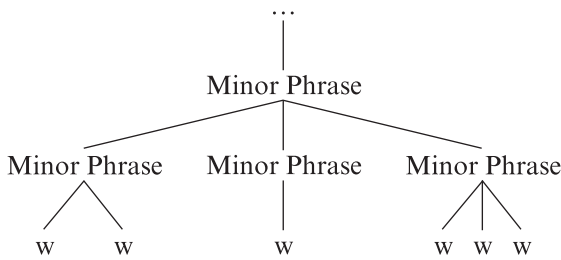


Very little of the diagram in (8) will be important for what follows. In fact, many aspects of the diagram in (8) have come under attack in recent work. For instance, Pak (2008) argues against the Strict Layer Hypothesis, discussing examples in which domains for phonological rules appear not to be in a reliable containment relation with each other. Ito and Mester (2007) offer arguments against dignifying the various levels of structure with distinct labels; in their model, phonological phrases are constructed recursively, but they claim that distinct labels for the different levels of structure are unnecessary. Whether (8) is the correct picture for prosodic structure is a matter that will not greatly concern us; the only level of importance to us will be the Minor Phrase, the phrase which immediately dominates the prosodic words.

In example (7), I made use of a rule that maps left edges of DPs onto prosodic boundaries. A great deal of research on prosody has been dedicated to discovering the correct form of this kind of rule; one perennial question, in particular, has to do with which syntactic categories these rules may refer to. I will not offer a principled answer to this question; I will address the question briefly again in section 3.3.3.2, where I will suggest that the maximal projections mapped onto prosodic domains might be the phases. For far more systematic investigation of the connection between phases and prosodic phrasing, see Dobashi 2004, Kahnemuyipour 2005, Ishihara 2007, Kratzer and Selkirk 2007, Pak 2008, and the references cited there.

I will follow Kubozono 2006 (and see Ishihara 2003 and Sugahara 2003 for much relevant evidence) in dealing with the facts of intonation in Japanese *wh*-questions by allowing Minor Phrases to be recursive, with multiple Minor Phrases being composed into a single, overarching Minor Phrase:⁴

(9)



The algorithm for constructing these larger Minor Phrases will be the following:

- (10) a. For one end of the larger Minor Phrase, use a Minor Phrase boundary that was introduced by a *wh*-phrase.
 b. For the other end of the larger Minor Phrase, use any existing Minor Phrase boundary.⁵

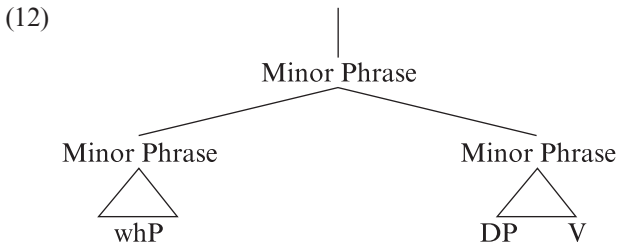
Because the two Minor Phrases referred to in steps (9a) and (9b) need not be the same, the result of applying this algorithm will be a Minor Phrase which may (though it need not) consist of multiple smaller Minor Phrases. Suppose we consider again the phrasing given in (7), repeated here as (11), with the first DP changed to a *wh*-phrase:

- (11) a. [TP (DP whP)] [VP (DP D NP) V]
 b. (whP) (D NP V)

As we saw before, the rule “insert a Minor Phrase boundary at the Left edge of every DP” gives the Minor Phrasing in (7b), with the first Minor Phrase consisting of the first DP, and the second Minor Phrase consisting of the second DP and the following verb. Applying the process in (10) to the phrasing in (11b) would involve keeping the Minor Phrase boundary introduced by the Left edge of the *wh*-phrase, and the right boundary at the end of the utterance, yielding the larger Minor Phrase in (11’c):

- (11’) a. [TP [DP whP]] [VP [DP D NP] V]
 b. (whP) (D NP V)
 c. (whP D NP V)

The structure in (11’) could be represented with the tree structure in (12):



The prosodic effects associated with Japanese *wh*-questions, discussed in section 3.1.1, would then apply to the larger Minor Phrase, thus allowing the *wh*-phrase and the complementizer at the end of the clause to share a Minor Phrase. I will refer to these larger Minor Phrases that languages construct via the algorithm in (10) as “*wh*-domains.”

The proposed condition on *wh*-prosody is then given in (13):⁶

- (13) Given a *wh*-phrase α and a complementizer C where α takes scope, α and C must be separated by as few Minor Phrase boundaries as possible, for some level of Minor Phrasing.

How languages satisfy the condition in (13) will depend on how they distribute their Minor Phrase boundaries. Languages will be able to leave *wh* in situ just in case they have Minor Phrase boundaries placed in such a way as to be able to use the procedure in (10) to create larger Minor Phrases containing both the *wh*-phrase and the complementizer. Languages that cannot do this will try to improve the structure with movement operations, arranging for the *wh*-phrase and its complementizer to be closer together.

There will be two main points of crosslinguistic variation that will be relevant for us. One will be the position of the complementizer: complementizers may either precede or follow their complements. The other has to do with the placement of Minor Phrase boundaries, which can be either to the Left or to the Right of certain maximal projections. These two binary parameters leave us with four logical possibilities, which we will spend the rest of this section outlining schematically. The next section will go on to investigate in more depth the prosodic properties of one language of each type.

3.2.1 *Final C, Minor Phrase Boundaries at Left Edges of XPs*

The first possibility is the one sketched in the beginning of this section; a language with a final complementizer that places Minor Phrase

boundaries at Left edges of certain maximal projections. Such a language, as we saw, would associate the syntactic structure in (14a) with the Minor Phrasing in (14b). It would also be able to create a larger Minor Phrase containing the *wh*-phrase and the associated complementizer, by keeping the Minor Phrase boundary associated with the Left edge of the *wh*-phrase (circled), and skipping the immediately following one, as in (14c):

- (14) a. [DP] [whP] [DP] V C
 b. (()) ()
 c. (()) ()

A language like this would therefore be able to leave *wh* in situ. We will see that Japanese is a language of this kind.

3.2.2 Final C, Minor Phrase Boundaries at Right Edges of XPs

A language like this would differ from Japanese in that it marks not Left edges, but Right edges of certain maximal projections with a Minor Phrase boundary:

- (15) a. [DP] [whP] [DP] V C
 b. () (()) () ()

As a result, it would be unable to create *wh*-domains of the type that Japanese uses. Recall that our algorithm for creating larger Minor Phrases says to take the boundary projected by the *wh*-phrase as one boundary for the larger Minor Phrase, and to use any Minor Phrase boundary on the other side as the other boundary. The Minor Phrase boundary associated with the *wh*-phrase (circled in (15) above) will always be to the right of the *wh*-phrase. Since the complementizer is final, a procedure that starts with keeping the boundary projected by the *wh*-phrase will be unable to improve the prosodic status of the *wh*-question; regardless of where the left boundary of the bigger Minor Phrase is, all the right boundaries intervening between the *wh*-phrase and the complementizer will be left intact. In the particular case of (15) (repeated as (15')), our algorithm allows for the construction of the larger Minor Phrase in (15'c), which fails to improve the structure at all with respect to the condition on *wh*-prosody in (13):

- (15') a. [DP] [whP] [DP] V C
 b. () (()) () ()
 c. (()) () ()

A language like this, then, cannot create *wh*-domains; it will have to resort to *wh*-movement in order to improve the prosodic status of the structure. In particular, it will have to do everything possible to get the *wh*-phrase further to the right, thus bringing it closer to the complementizer. We will see that this is the behavior of Basque.

3.2.3 Initial C, Minor Phrase Boundaries at Left Edges of XPs

The third case of interest is that of a language that is the mirror image of Basque; in this language, both the complementizer and Minor Phrase boundaries precede *wh*-phrases. Just as in Basque, this language will be unable to create *wh*-domains, and for the same reason; our procedure for creating *wh*-domains starts by keeping the Minor Phrase boundary projected by the *wh*-phrase, and in this case that Minor Phrase boundary is between the *wh*-phrase and the complementizer, with the result that creating a larger Minor Phrase boundary will not improve the prosodic structure, as far as the conditions on *wh*-prosody are concerned. A sample syntactic structure and its Minor Phrasing are given in (16a,b), with the boundary projected by the *wh*-phrase circled; (16c) shows the results of applying our procedure to create a larger Minor Phrase:

- (16) a. C [DP] [**whP**] [DP]
 b. () () () ()
 c. () () () ()
-

As (16) shows, creating a larger Minor Phrase does not improve the structure; in particular, the *wh*-phrase is separated from C by just as many Minor Phrase boundaries in (16c) as in (16b). This language therefore cannot leave *wh* in situ; it will have to resort to *wh*-movement of the familiar type, moving *wh*-phrases to put them closer to C. We will see later that Tagalog is a language of this type.

3.2.4 Initial C, Minor Phrase Boundaries at Right Edges of XPs

Finally, we arrive at a language that is the mirror image of Japanese, with complementizers and Minor Phrase boundaries on opposite sides of *wh*-phrases; in this case, the complementizer is initial, and Minor Phrase boundaries follow their maximal projections. Just like Japanese, this type of language will be able to leave *wh* in situ, by creating a larger Minor Phrase containing both the *wh*-phrase and its associated complementizer; in this case, the Minor Phrase will begin with the complementizer and end with the *wh*-phrase:

- (17) a. C [DP] [whP] [DP]
 b. () () ()
 c. () () ()

The language of this type to be discussed below will be Chicheŵa.

3.2.5 Predictions and a Hedge

In section 3.3 we will move on to outline the prosodic systems of Japanese, Basque, Tagalog, and Chicheŵa, and will see that they do indeed fall where I have put them in the typology above. Before we do that, however, we are already in a position to make at least two typological predictions.

One has to do with the relation between the position of the complementizer and the behavior of *wh*-phrases. Sections 3.2.1 and 3.2.2 discussed the two logically possible types of complementizer-final languages. What we have seen is that such languages will either leave *wh* in situ or will take whatever steps they can to bring *wh*-phrases further to the right. In other words, they will not have *wh*-movement of the traditional kind, moving *wh*-phrases to the left periphery of the clause.⁷ This seems to be correct; verifiably complementizer-final languages seem to universally lack traditional leftward *wh*-movement:

- (18) a. Taroo-wa **nani-o** katta no? (Japanese)
 Taroo-TOP what-ACC bought Q
 ‘What did Taroo buy?’
 b. Bkrashis-lags-kysis **gare** gzigsgnang-pa-red pas? (Tibetan)
 Tashi-HON-ERG what buy-do-PAST-AGR Q
 ‘What did Tashi buy?’
 c. C’am^wit **mir** cək^wərəcniṃ? (Chaha)
 C’am^wit what cooked
 ‘What did C’am^wit cook?’
 d. Qiaofong mai-le **sheme** (ne) (Chinese)
 Qiaofong buy-ASP what Q
 ‘What did Qiaofong buy?’

Moreover, it does appear to be the complementizer that is the best predictor of *wh* behavior; *wh*-phrases remain in situ in complementizer-final languages, regardless of whether those languages are generally head-final (18a–c) or not (18d).

If complementizer-final languages with obligatory overt *wh*-movement are genuinely unattested, then I think we have a good argument against

one of the options discussed above for dealing with the “look-ahead” problem inherent in the proposal developed here. Recall that one of the ideas discussed there was to simply retain our existing structure of strong and weak features regulating overt and covert *wh*-movement; on this view, the theory developed here would be a theory of the prosodic properties that well-formed questions must have in human language, but the syntactic computation itself would make no reference to these prosodic properties. The theory would simply be responsible for explaining why English, for example, must have a strong feature driving its *wh*-questions, while Japanese would have a weak one.

On this approach to the look-ahead problem, however, we would have no way of explaining the absence of complementizer-final languages with obligatory overt *wh*-movement to the left periphery of the clause. If Japanese did have a strong *wh*-feature, the questions created by *wh*-movement would be prosodically well-formed; Japanese is always capable of creating a *wh*-domain to connect a *wh*-phrase with an interrogative complementizer, over any distance, as long as the complementizer is to the right of the *wh*-phrase. *Wh*-movement does nothing to improve the prosodic structure of a Japanese question, but it would not harm the prosodic structure either.

What we appear to need, then, is a system that permits overt *wh*-movement just in case it improves the prosodic structure of the *wh*-question. In other words, we need the syntactic operation of *wh*-movement to take the prosodic consequences of its actions into account.

Another prediction of the theory developed here has to do with optionality of *wh*-movement. We have now seen two basic approaches to forming *wh*-questions; leaving the *wh*-phrase in situ, and moving it to put it closer to the complementizer. Some languages lack the prosodic means to leave *wh*-phrases in situ, and must do *wh*-movement. But for languages that have the option of leaving *wh* in situ, what we now expect is that, all other things being equal, *wh*-movement ought to also be an option, as long as the movement improves the prosodic structure of the question. Given that *wh*-movement and *wh* in situ both create prosodically acceptable structures, unless we add something to the theory to make one of these options preferable, both ought to be available, in principle. This seems to be the right result. It is most straightforwardly visible in complementizer-initial languages; what we expect is that even in those complementizer-initial languages that allow *wh* in situ (languages of the

type discussed in section 3.2.4), *wh*-movement will also be an option. As far as I know, this is the case:

- (19) a. qel ʕaali ʕtara **ʔeeh**? (Egyptian Arabic)
 uncle Ali bought what
 ‘What did Ali’s uncle buy?’
 b. **ʔeeh** ʕtara qel ʕaali?
- (20) a. Tu as vu **qui**? (French)
 you have seen who
 ‘Who did you see?’
 b. **Qui** tu as vu?

Finally, let me end this section with a hedge. In the discussion of prosody above I have used the language of Selkirk’s (1984) work and its many descendants, suggesting that languages may pick either right or left edges of certain maximal projections for mapping onto prosodic boundaries. I picked this particular approach since it is an influential one, and one which allows the predictions above to be outlined fairly straightforwardly. Even if it is at least partly incorrect, however (and it is far from being the only approach in the literature: see Nespor and Vogel 1986, Truckenbrodt 1995, 1999, Seidl 2001, Wagner 2005, Pak 2008, Selkirk 2009, and the references cited there for much discussion), I believe that the results discussed above should still stand. All that is necessary for this theory to work, as far as I can see, is an approach to prosody that allows prosodic phenomena to ultimately be sensitive to certain syntactic boundaries, and that allows the choice of relevant syntactic boundaries to vary crosslinguistically. The claim made above is essentially that *wh* in situ is a privilege reserved for languages that routinely associate prosodic phenomena with boundaries on a particular side of *wh*-phrases, and that have the complementizer on the opposite side of the clause. Any such theory will allow us to make generalizations about syntactic edges which routinely demarcate prosodic phenomena. The claim of this chapter is that the creation of *wh*-domains is governed by the language-specific principles that regulate prosodic phenomena more generally; once we know, for instance, that a given language standardly associates prosodic phenomena with the left edges of DPs, we can conclude that the language will also be able to demarcate *wh*-domains with left edges of DPs.

A variety of theories of the mapping between syntax and prosody are compatible with such a conclusion. I have described the relationship between prosodic phenomena and syntactic boundaries in terms of a mapping from syntactic structure onto prosodic structure, but this need not

be the correct analysis. We could restate the account, for example, in terms of a theory of prosody that associated prosodic phenomena directly with syntactic structure, rather than with a prosodic structure derived from syntactic structure. Alternatively, we could imagine a theory with a more uniform mapping of syntactic structure onto prosodic structure than I have assumed here, which allows languages to make language-specific choices about which prosodic boundaries are relevant for the distribution of prosodic phenomena; such a theory might state, for instance, that languages universally map both edges of DPs onto prosodic boundaries, but that a given language may then elect to routinely use one or another of these edges for the organization of actual prosodic phenomena.

Similarly, the world of prosodic systems need not be as neatly symmetric as described above for this to be true; there may be more types of prosodic systems than I have outlined. If it turns out, for example, that some languages routinely mark *both* sides of maximal projections with prosodic boundaries, we would expect these languages to allow *wh* in situ. In such a language, it would always be possible to generate a *wh*-domain by taking one of the boundaries projected by the *wh*-phrase (crucially, the boundary projected on the opposite side of the *wh*-phrase from the complementizer) as one edge, and a domain next to the complementizer as the other edge.

In the case studies to follow, we will often encounter one particular type of complication; the Selkirk-style approach will work well for most types of phrases, but will fail for verbs or for verb phrases, which will turn out to have their own special phrasing. In some cases (e.g., Tagalog, Chicheŵa), phrase boundaries that we would expect to find in the neighborhood of the verb will be unaccountably absent; in others (e.g., Basque, Bangla), a special phrase boundary will be introduced to separate the verb from adjacent material with which it would otherwise be phrased. I will leave these mysteries as mysteries for now, hoping that at some point they will turn out to be instructive about the syntax of the clause, perhaps being related to verb movement in some way.⁸ More research into the typology of prosodic systems should allow us to address these questions. For the time being, I will continue to work with the typology discussed above.

3.3 Case Studies

In what follows we will discuss the four types of languages outlined above in more depth.

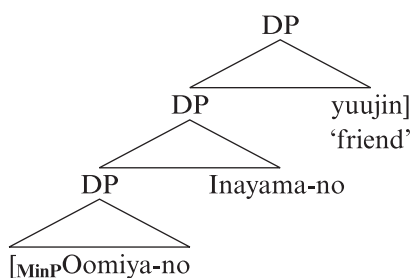
3.3.1 Japanese: *Final* Complementizer, *Minor Phrase* Boundaries to the *Left* of *Certain XPs*

Japanese prosody is the subject of a rich and ongoing literature (see Poser 1984, Selkirk and Tateishi 1988, 1991, Ishihara 2003, Sugahara 2003, and the references cited there for much discussion). Here I will rely heavily on the work of Selkirk and Tateishi (1988, 1991).

Japanese *Minor Phrase* boundaries are signaled by a *Low* tone on the first mora of the phrase, a phenomenon known as *Initial Lowering*. *Minor Phrasing* is determined by several factors, of which the most syntactic in nature is a requirement that *Left* edges of certain maximal projections (including *DPs*) be mapped onto *Minor Phrase* boundaries.⁹ This requirement can be illustrated with the ambiguous string of words in (21), which has either of the meanings in (21a) or (21b); in other words, *Oomiya-no* ‘from Oomiya’ can be taken to modify either *Inayama* ‘(Mr.) Inayama’ or *yuujin* ‘friend’. These readings correspond to the trees in (22a) and (22b) respectively:

- (21) Oomiya-no Inayama-no yuujin (Japanese)
 Oomiya-GEN Inayama-GEN friend
 a. ‘the friend of [Mr. Inayama from Oomiya]’
 b. ‘Mr. Inayama’s [friend from Oomiya]’

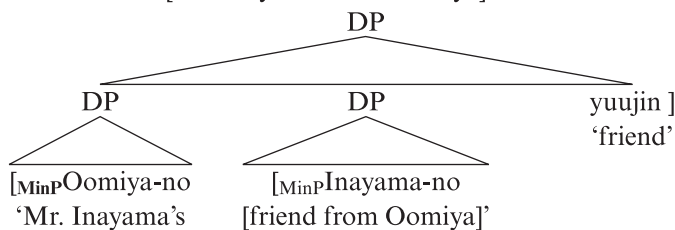
(22) a.



L

‘the friend of [Mr. Inayama from Oomiya]’

b.



The trees in (22) are annotated with their Minor Phrasing. The tree in (22b) must have a Minor Phrase break (and hence a Low boundary tone, realized on the first mora of the following word) between *Oomiya-no* and *Inayama-no*. The tree in (22a), by contrast, need not have such a prosodic break.

Selkirk and Tateishi (1988, 1991) propose that we capture this distinction between the trees in (22) by making reference to Left edges of maximal projections; in (22b), but not in (22a), a Left edge of a DP (namely, *Inayama-no*) intervenes between *Oomiya-no* and *Inayama-no*, and this Left edge is mapped onto a Minor Phrase boundary. Note that Left and not Right edges must be crucial; in both of the trees in (22), the Right edge of a DP (namely, *Oomiya-no*) appears in this position.

This mapping from maximal projection boundaries to prosodic boundaries is not the only condition on Minor Phrasing, but the other conditions seem less syntactic in nature. One of the conditions has to do with the distribution of lexical accent. Japanese has lexically accented words and lexically unaccented words, and one requirement on Minor Phrases is that they cannot contain more than one lexically accented word. Minor Phrase boundaries are therefore always inserted in such a way as to avoid this, whenever the situation might arise, regardless of whether the positioning of these boundaries marks edges of maximal projections. Minor Phrases are also subject to a length restriction; the specifics of this seem to vary from speaker to speaker and to be at least partly dependent on speech rate, but for some speakers, at least, Minor Phrases may not be more than three words long.

We have seen that Japanese is a language that routinely inserts Minor Phrase boundaries at Left edges of certain maximal projections; it also inserts Minor Phrase boundaries in some other positions, arguably positions that are not determined by the syntax. Japanese is also, famously, a head-final language, and in particular has final complementizers. In other words, Japanese places its Minor Phrase boundaries and its complementizers on opposite sides of potential *wh*-phrases. Given the theory outlined in section 3.2, this means that Japanese ought to be able to leave *wh* in situ; Japanese is a language that can create prosodic “*wh*-domains” by merging Minor Phrases to create superordinate Minor Phrases, which will begin with a Minor Phrase boundary projected by a *wh*-phrase and end at the complementizer where that *wh*-phrase takes scope. As we have seen, this is indeed the case.

3.3.2 Basque: *Final Complementizer*, *Minor Phrase Boundaries to the Right of Certain XPs*

In my discussion of Basque I will rely on Elordieta's (1997) analysis of the facts; see also Arregi 2002 and Gussenhoven 2004 for discussion.

Basque Minor Phrases are like their Japanese counterparts in that they begin with a Low tone, in this case realized on the first syllable of the first word of the Minor Phrase. Their distribution is quite different, however, as we will see. It will perhaps be easiest to discuss the Basque system by contrasting it with the Japanese one.

We saw in section 3.3.1 that Japanese always puts Minor Phrase boundaries at left edges of certain projections, including DPs. This is very far from being true in Basque; a Basque sentence may have a number of successive DPs with no Minor Phrase boundaries between them, regardless of the domination relations between them. All of the material before the verb in the examples in (23), for example, consists of a single Minor Phrase:

- (23) a. [umiari] [normalian] [urà] [emoten dotzágu] (Basque)
 child-DAT normally water give AUX
 'Normally, we give water to the child'
 b. [Sure [erriko [alkatia]]] [Iruñara] [allaga
 our town's mayor Iruña-at arrived
 da] (Gussenhoven 2004)
 AUX
 'The mayor of our town has arrived in Iruña'

Both of these examples contain a DP in preverbal position that is c-commanded but not dominated by a preceding DP; in other words, these two DPs are linearly separated by both a Left edge of a DP (the second one) and the Right edge of a DP (the first one). Despite this, no Minor Phrase boundary intervenes between the two DPs. Neither a Left or a Right edge of a DP, then, is reliably mapped onto a Minor Phrase boundary in Basque. Instead, Minor Phrase boundaries appear in two types of positions.

Like Japanese, Basque distinguishes between lexically accented and lexically unaccented words. Unlike in Japanese, accented words in Basque must always be *followed* by a Minor Phrase boundary:

- (24) a. [_{MinP}] b. [_{MinP}] [_{MinP}]
 a'. lagun-en dirua b'. lagun-en dirua
 friend-GEN.SG. money friend-GEN.PL. money
 'the friend's money' 'the friends' money'

The DPs in (24a') and (24b') have the minor phrasing in (24a) and (24b); because *lagúnen* 'friend-genitive plural' in (24b') is lexically accented, it must be followed by a Minor Phrase boundary (with the result that the first syllable of *dirua* 'money' receives a low tone in (24b')).

In Japanese, by contrast, lexically accented words need not be followed by Minor Phrase boundaries. Selkirk and Tateishi (1988) offer the phrasings in (25a¹) and (25a²) as possible prosodic structures for the string of words in (25a), which begins with an accented word:

- (25) a¹. (MinP) (MinP)
 a². (MinP) (MinP) (MinP)
 a'. [[[[Yamámori-no] yamagoya-no] uraniwa-no]
 umagoya-ni]]]] . . . (Japanese)
 'In the barn in the backyard of a hut in Yamámori . . .'

Here Minor Phrasing is essentially free, dictated only by the need to make Minor Phrases sufficiently short. Thus, accented words in Japanese can be followed by a Minor Phrase break, but need not be.

The other position where Minor Phrase boundaries are required in Basque is immediately before the verb; that is, the first syllable of the verb must have the Low tone which signals the beginning of a new Minor Phrase. Here, again, Basque differs from Japanese, which allows the verb to phrase together with a preceding DP. The upshot of this is that for an SOV sentence consisting entirely of unaccented words, Basque and Japanese have the contrasting Minor Phrase structures in (26–27):

- (26) a. (MinP) (MinP) (Japanese)
 a'. [*subject*] [*object*] *verb*
 (27) a. (MinP) (Basque)
 a'. [*subject*] [*object*] *verb*

Basque, then, is unlike Japanese, in that it does not routinely place Minor Phrase boundaries at the Left edges of maximal projections. If anything, it seems to place its boundaries at the Right edges of certain projections. In particular, Basque puts Minor Phrase boundaries after lexically stressed words, and as a reviewer notes, we can understand the insertion of a boundary before the verb as marking the Right edge of the ν P, if the verb has undergone head movement out of the ν P to some high functional head.

It may well be that the prosodic behavior of lexically stressed words is irrelevant. Since lexical stress is crucially tied to particular lexical

items, the prosodic boundaries associated with lexical stress may be placed postsyntactically, after lexical insertion is complete. In the introduction to this chapter I briefly raised the “look-ahead” problem inherent in the theory being developed here; how does the syntax make use of facts about the prosodic representation in order to decide whether to perform *wh*-movement overtly or covertly? I return to this question in section 3.6, but depending on the answer to the look-ahead question, we might hope that the syntax would be blind to postsyntactically inserted prosodic boundaries. For our purposes at the moment, however, the only important property of Basque prosody is that it is unlike Japanese prosody; Basque does not mark the Left edges of maximal projections.

Since Basque, like Japanese, is head-final, this means that Basque also differs from Japanese in that the complementizer is not routinely on the opposite side of *wh*-phrases from the Minor Phrase boundaries associated with those *wh*-phrases. Consequently, Basque ought to be unable to create the *wh*-domains that we find in Japanese. Recall that our algorithm for creating *wh*-domains begins by preserving the Minor Phrase boundary introduced by the *wh*-phrase; in Basque, if there is such a boundary, it will intervene between the *wh*-phrase and C, preventing the creation of a single Minor Phrase containing them both.

What should Basque do instead? What it in fact does is arrange for *wh*-phrases to be immediately preverbal:

- (28) a. Mirenek séin ikusi rau? (Ondarroa Basque)
 Miren-ERG who-ABS see-PRF AUX.PR (Arregi 2002)
 ‘Who has Miren seen?’
 b. *Séin Mirenek ikusi rau?
 who-ABS Miren-ERG see-PRF AUX.PR
- (29) a. Jon señek ikusi rau?
 Jon-ABS who-ERG see-PRF AUX.PR
 ‘Who saw Jon?’
 b. *Señek Jon ikusi rau?
 who-ERG Jon-ABS see-PRF AUX.PR

This requirement is expected under our theory. Consider, for example, the *wh*-phrase *séin* ‘who-ABS’ in (28). In (28b), where *séin* is not the immediately preverbal phrase, it is separated from the clause-final complementizer by two Minor Phrase boundaries: the one immediately following

the lexically accented word *séin*, and the one right before the verb. In (28a), by contrast, only one Minor Phrase boundary (which is both immediately after *séin* and immediately before the verb) intervenes between the *wh*-phrase and the complementizer. The preference for the word order in (28a) over that in (28b) therefore follows.

On the other hand, we might expect to be able to improve the prosodic structure even more. If we take the facts about Basque prosody discussed above to indicate that Minor Phrase boundaries are established at Right edges of certain syntactic projections in this language, then we might expect Basque to move *wh*-phrases to postcomplementizer positions. The result would be a string like the one in (38):

(30) V C **wh**)

In (30), the *wh*-phrase, with its following Minor Phrase boundary, follows the complementizer, with the result that we ought to be able to construct a *wh*-domain linking the complementizer to the *wh*-phrase.

In fact, Basque is indeed capable of moving phrases to positions following the V-T-C complex (Elordieta 1997, 29):

(31) eweldi onà emon dábe mariñerúak (Basque)
 weather good give AUX fishermen-ERG
 ‘The fishermen have predicted good weather’

In (31), the DP *mariñuerúak* ‘fishermen-ERG’ follows the verb, and the attached complementizer. However, Elordieta (1997) reports that such postverbal material is always associated with radical pitch compression. In other words, postverbal material in Basque is already subject to conditions on prosody which might be incompatible with the conditions on *wh*-prosody being explored here.¹⁰

If we assume that movement to a postverbal position is ruled out on independent grounds, then the behavior of Basque is explained on the theory given here. The universal conditions on *wh*-prosody require Basque to minimize the number of Minor Phrase boundaries intervening between the *wh*-phrase and the associated complementizer. Unlike Japanese, Basque cannot achieve this simply by manipulating the prosody, for reasons that we have now derived from the basic rules for prosody in Basque; unlike Japanese, Basque does not routinely place Minor Phrase boundaries at Left edges of maximal projections, and therefore is not in a position to create a new Minor Phrase beginning with the *wh*-phrase and ending with the complementizer. Basque must therefore resort to

movement, arranging for the *wh*-phrase to immediately precede the verbal complex in which the complementizer is located.

The Basque case is a potentially illuminating one for the nature of the prosodic requirements on *wh*-questions. As we saw in (28) and (29), Basque *wh*-phrases must be immediately preverbal. Arregi (2002) argues that this is accomplished by leftward scrambling of non-*wh*-phrases. Consider (29), repeated as (32):

- (32) a. Jon señek ikusi rau? (Ondarroa Basque)
 Jon-ABS who-ERG see-PRF AUX.PR
 ‘Who saw Jon?’
 b. *Señek Jon ikusi rau?
 who-ERG Jon-ABS see-PRF AUX.PR

According to Arregi, the well-formed (32a) is created by scrambling the object *Jon* to the left of the subject *señek* ‘who-ERG’. In other words, if Arregi is right, then the *wh*-phrase is put in the position required by the prosody, not by movement of the *wh*-phrase, but by movement of the non-*wh*-phrase. Basque does have scrambling, even in non-*wh*-questions, so the operation Arregi posits requires no new stipulations about Basque grammar.

In the account given here of Basque, this “altruistic” scrambling succeeds in improving the prosodic structure, though it does not make it perfect; there is still one Minor Phrase boundary between the *wh*-phrase and the corresponding complementizer. 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; for reasons having to do with how Basque prosody works, Basque cannot fulfill this requirement perfectly, but the availability of scrambling allows the structure to be improved. The prosodic requirements do not empower the syntax to perform operations it cannot otherwise perform; it cannot move *wh*-phrases rightward into positions that are not there, or head-move the complementizer to a nonexistent initial position, for example.

Hypothetically, then, we might expect to find languages that are prosodically like Basque but differ from Basque in that they lack scrambling. Such a language would then be unable to improve the prosodic structure of its *wh*-questions at all; it would leave *wh*-phrases in situ (since moving them leftward would only make the situation worse), but would be unable to scramble non-*wh*-phrases out of the way to bring the *wh*-phrase closer to C.

Thus, we expect that *wh* in situ languages without scrambling (languages like Chinese, for example) might have the prosodic properties either of Japanese or of Basque; either is consistent with the approach developed here. Ultimately, of course, we hope to avoid stipulating that a given language either has or lacks scrambling, predicting this contrast from independently observable differences; for the time being, however, we will concentrate on developing a theory of this kind for *wh*-movement, leaving other types of movement for future work.

3.3.3 Tagalog: *Initial Complementizer, Minor Phrase Boundaries to the Left of Certain XPs*

Tagalog prosody has been the subject of comparatively little work (though see Schachter and Otnes 1972 as well as Kaufman 2005 for some discussion). What follows will be some of the results of a pilot study conducted at MIT.¹¹

Various interesting properties of Tagalog will play no role in what follows. In particular, Tagalog verbs bear a type of morphology that has been the object of a great deal of study (see Richards 2000, Rackowski 2002, Aldridge 2004, and the references cited there for discussion; the facts are also briefly discussed in section 2.5.2), which refers to one of the arguments of the verb; it has sometimes been called “voice” morphology, I think misleadingly. Following Rackowski 2002, I represent this morphology with glosses like NOM (verbal agreement with the nominative argument), ACC, DAT, and so on. Nominals typically begin with case particles, glossed here with the relevant Tagalog morphemes ANG (nominal with which the verb agrees), SA (dative), NG (other).

Tagalog complementizers are initial, as we can see in the embedded clause of (33):

- (33) Hindi ko alam [kung sumayaw si Maria] (Tagalog)
 not NG.I know whether NOM-danced ANG Maria
 ‘I don’t know whether Maria danced’

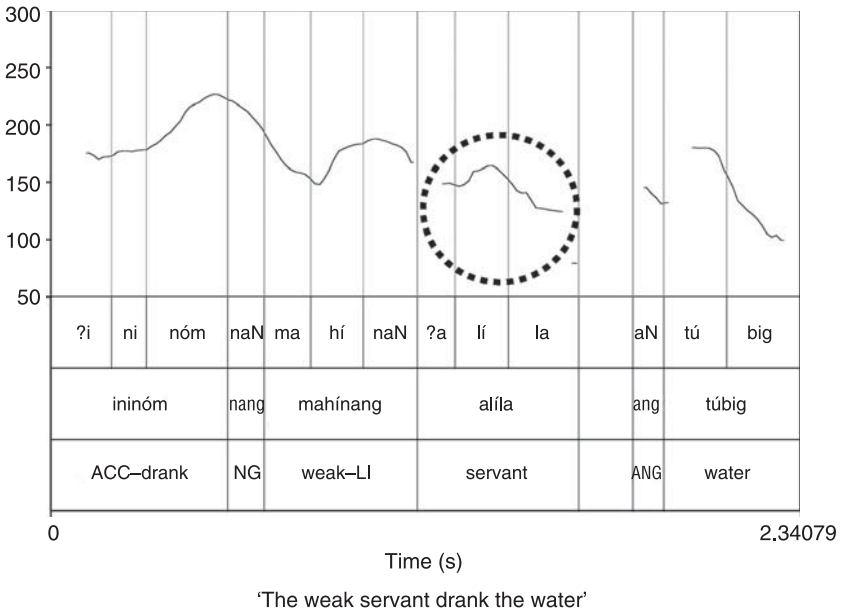
Also (and usefully for what is to follow) attributive adjectives in Tagalog may either precede or follow the noun they modify; a morpheme sometimes called the “linker,” which I will gloss with LI, appears between them:

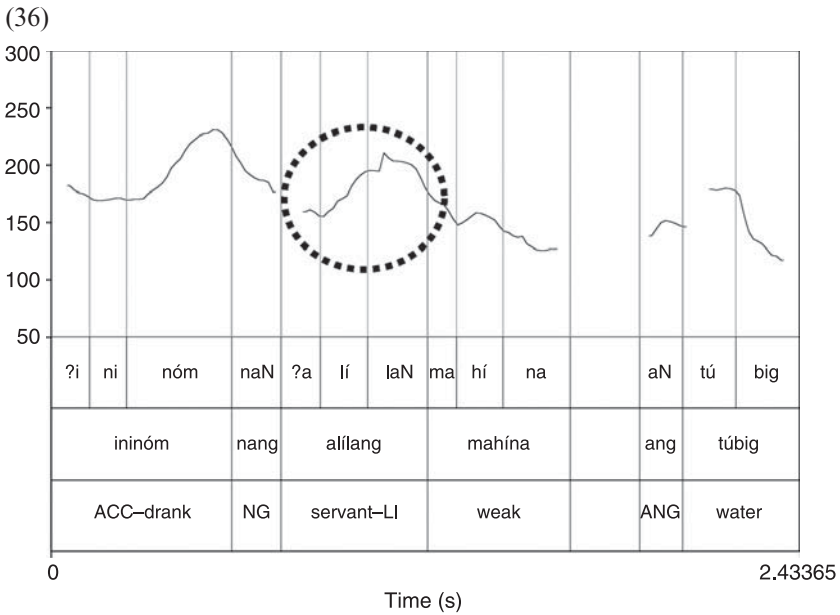
- (34) a. Sumayaw ang lolang mayaman (Tagalog)
 NOM-danced ANG grandmother-LI rich
 ‘The rich grandmother danced’

- b. Sumayaw ang mayamang lola
 NOM-danced ANG rich-LI grandmother

3.3.3.1 A Theory of Tagalog Prosody We can begin our study of Tagalog intonation by considering the pitch tracks in (35) and (36). These two sentences both mean ‘The weak servant drank the water’, and differ only in the order of the adjective *mahina* ‘weak’ and the noun *alila* ‘servant’:

(35)





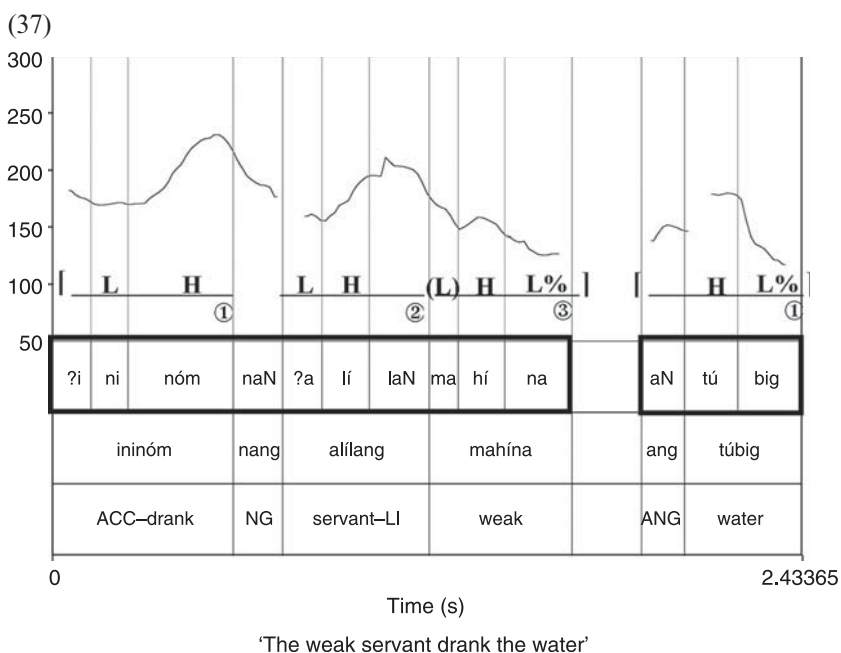
'The weak servant drank the water'

If we focus on the pitch track for the word *alila* 'servant' (circled in these examples), we can see that a given word need not always have the same intonation. In (35), *alila* has a peak on the second syllable, with the third syllable lower than the second. In (36), by contrast, the peak is on the third syllable. A similar effect can be seen on the adjective *mahina* 'weak', which has a clear fall in (36) that starts at the second syllable and continues through the third, while in (35) the pitch does not begin to fall until the end of the word.

Tagalog words, then, may either end in a fall or a rise; the final syllable may be either higher or lower than the preceding one. Considering the other words of these sentences, we can see that the verb *ininom* 'drank' consistently ends in a rise, while *tubig* 'water' consistently ends in a fall.

Since *tubig* 'water' is clearly phrase-final (since it is utterance-final), we might take the final-rise/final-fall distinction to distinguish between phrase-final and non-phrase-final words. On this theory, there is a phrase boundary just before *ang tubig* 'the water'. Phrases are marked in Tagalog by a phrase-final Low boundary tone, which causes phrase-final words to end in a fall. Thus, whatever word is just before *ang tubig* 'the water' in these examples is phrase-final, and must end in a fall. Non-phrase-final words, by contrast, end in a rise.

This assignment of phonological phrases also accounts for a pattern of downstep that we can see in these examples. The first three peaks in each example are successively downstepped, with each peak slightly lower than the preceding one. The last peak, the one on *tubig* ‘water’, is comparatively higher. Thus, phrase boundaries are apparently points of downstep reset in Tagalog. The preceding examples have the phrasing represented by the dark boxes in (37), with the verb and the subject phrased together, and a second phrase consisting just of the object:



The first intonational phrase of (37) contains three content words, *inínóm* ‘drank’, *alílang* ‘servant-LI’, and *mahína* ‘weak’. The first two of these have their intonation peaks on the last syllable, but for the last one, the phrase-final Low boundary tone pushes the peak back to the second syllable. The second intonational phrase of (37) has only the content word *tubig* ‘water’; being phrase-final, this word also has a penultimate pitch peak. This peak also exhibits downstep reset; each of the peaks in the first phrase is lower than the preceding one, but the peak of the second phrase is higher than the preceding one.

For these sentences, then, sentences with the word order VSO are phrased with the verb and the subject in one phrase and the object in a

second phrase. There is much more to be said about the placement and nature of the pitch peaks in these words, but we can ignore this for now, concentrating instead on the question which concerns us; what is the algorithm for phonological phrasing? Two algorithms that would get the phrasing observed so far are given in (38):

- (38) a. Place a phrase boundary at the right edge of every DP.
 b. Place a phrase boundary at the left edge of every DP, except for the one immediately after the verb.

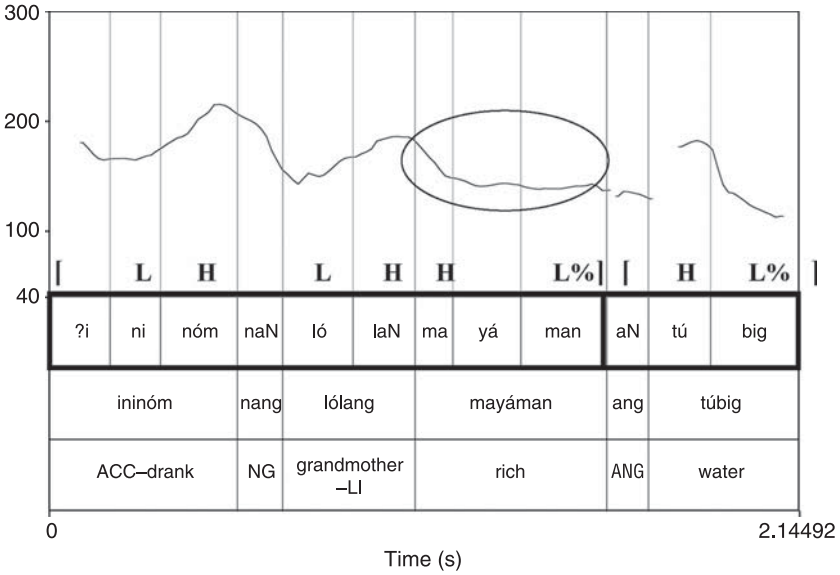
Although the second of these algorithms is more complicated, I will now try to show that it is the correct one; in general, Tagalog places phonological phrase boundaries at left edges of certain maximal projections (including DPs), with the proviso that the verb must be phrased with immediately following material.

One argument for this has to do with the phrasing of postnominal possessors in Tagalog:

- (39) *Ininom* [ng *lolang mayaman* [*ni Maria*]][ang
 ACC-drank NG grandma-LI rich NG Maria ANG
tubig] (Tagalog)
 water
 ‘Maria’s rich grandmother drank the water’

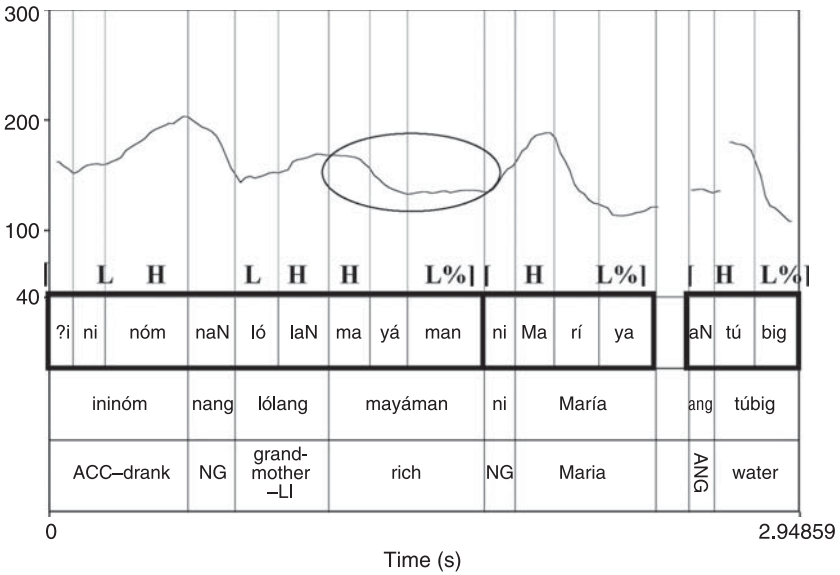
In a sentence like (39), the possessor *ni Maria* and the possessee *ng lolang mayaman* ‘the rich grandmother’ are separated by a left edge of a DP (namely, *ni Maria*), but not by a right edge of a DP. The algorithm in (38a), then, predicts that no phonological phrase boundary should precede *ni Maria*; the algorithm in (38b), on the other hand, predicts the presence of a phonological phrase boundary there. The second prediction is correct, as we can see by comparing the pitch tracks in (40) and (41):

(40)



'The rich grandmother drank the water'

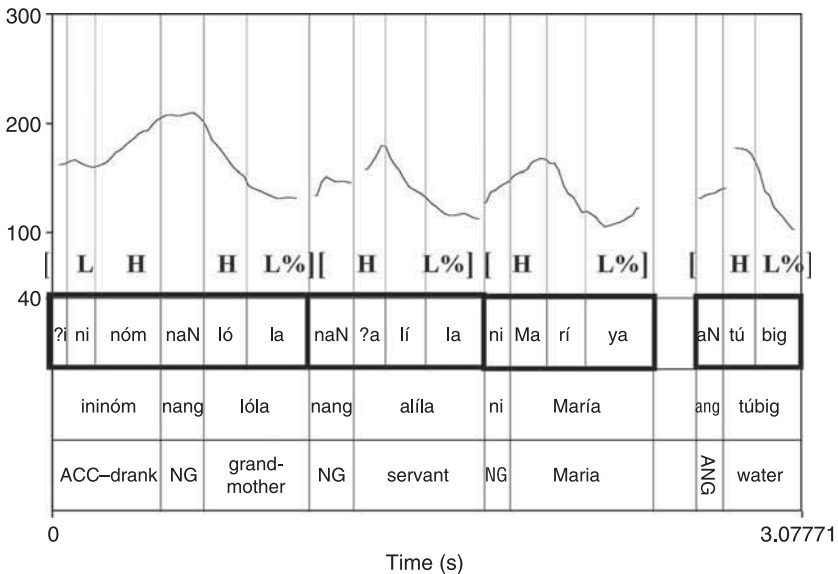
(41)



'Maria's rich grandmother drank the water'

(40) and (41) differ just in that (41) has a possessor, *ni Maria*, for the first DP. In both, the word just before the possessor (*mayaman* ‘rich’) has the pitch contour we expect in phrase-final position; its final syllable is low rather than high. In addition, the pitch peak on *ni Maria* in (41) is higher than the preceding one; in other words, the possessor exhibits reset of downstep, another test for phonological phrasing. Both tests argue for the presence of a phonological phrase boundary before the possessor. Again, this phrase boundary must be due to the presence of a Left edge of a DP (namely, the left edge of the possessor, *ni Maria*), since there are no Right edges of DPs that precede the possessor. We find the same result in longer sentences with multiply nested possessors:

(42)



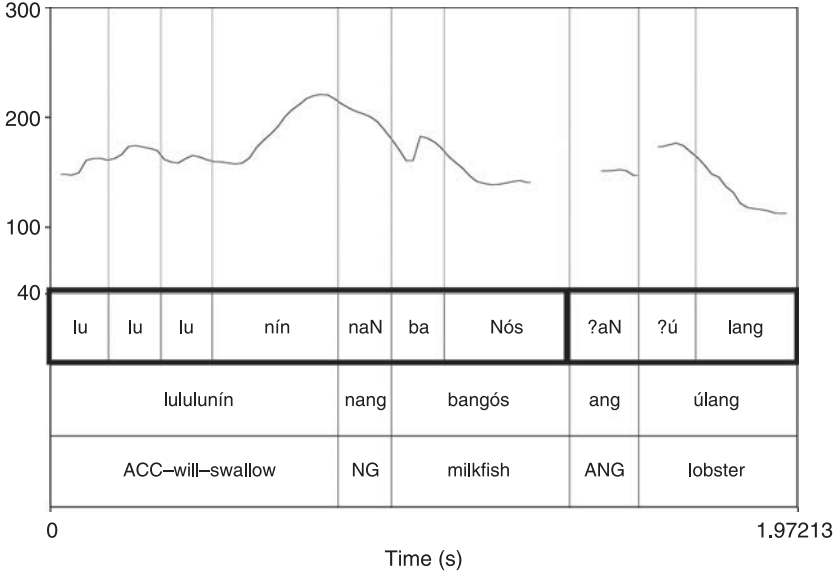
‘Maria’s servant’s grandmother drank the water’

Here, *lola* ‘grandmother’, *ng alila* ‘servant’, and *ni Maria* all exhibit phrase-final prosody, characterized by their final Low tones (compare them with the prosody of the verb, the only word in this sentence which is not phrase-final; this one ends in a high tone, like all the non-phrase-final words we have seen).

The phrasing of possessors is one argument that Tagalog uses Left boundaries, rather than Right boundaries, to establish its phonological phrasing, and that the phrasing of the verb with the immediately following DP is the result of an overriding requirement that the verb not be in a phrase by itself. As we would expect on this theory, the verb’s need to

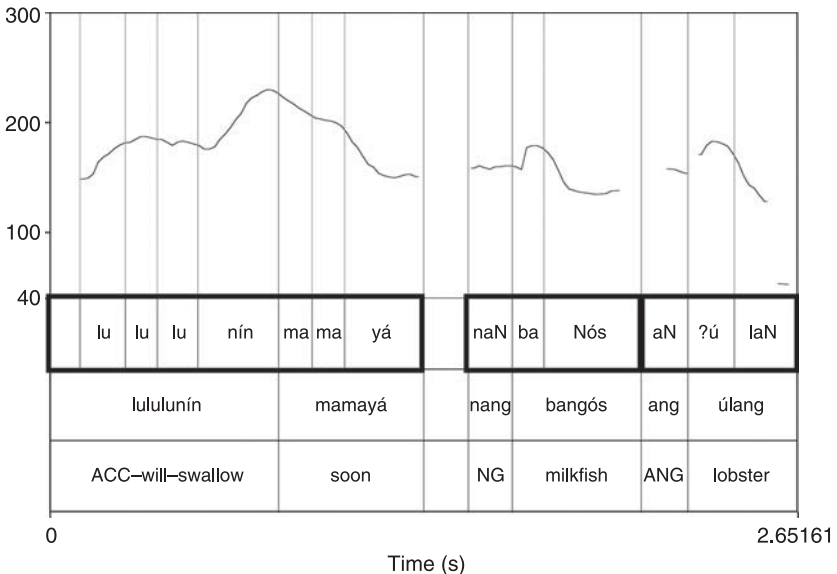
phrase with following material can be satisfied by a number of types of phrases. Adverbs, for example, can be phrased with the preceding verb.¹²

(43)



'The milkfish will swallow the lobster'

(44)



'The milkfish will swallow the lobster soon'

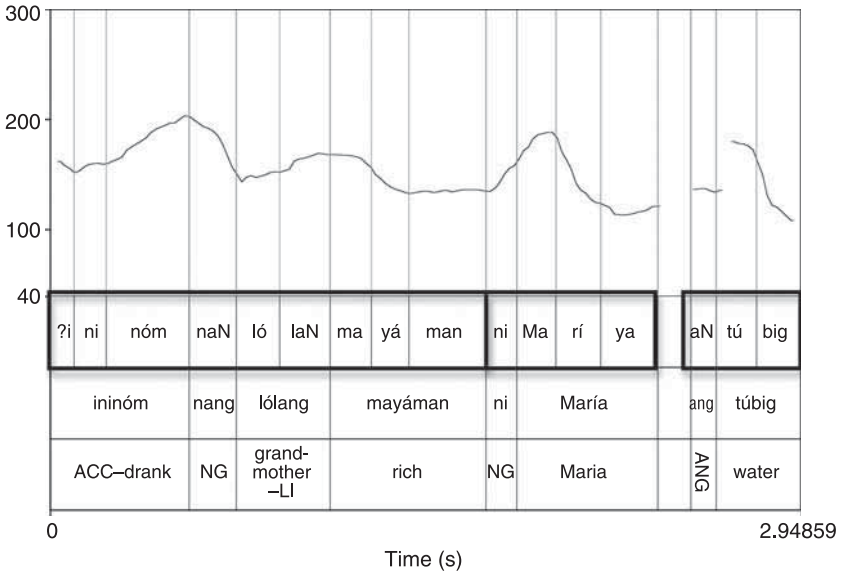
(44) differs from (43) just in the presence of a postverbal adverb, *mamaya* ‘soon’. This adverb exhibits phrase-final prosody, ending in a Low tone; it is apparently phrased with the preceding verb, and followed by a phonological phrase break. This phrase break could be introduced by the Left edge of the following DP *ng bangos* ‘the milkfish’; if phrase breaks are only introduced by Right edges of DPs, however, the facts in (44) are difficult to explain.

3.3.3.2 An Alternative Proposal A reviewer offers an alternative to the above account of Tagalog prosody. As he rightly points out, the theory given here relies on a brute-force characterization of the phrases that are mapped onto prosodic domains; I have simply declared here that DPs, and not other maximal projections, are associated with prosodic boundaries. The reviewer suggests that a more elegant principle for prosodic mapping in Tagalog would run as follows:

(45) In Tagalog, associate the Left edge of any *branching* maximal projection with a Minor Phrase boundary.

The principle in (45) uses the idea (see Nespor and Vogel (1986) and Uechi (1998) for discussion) that branching nodes—that is, nodes that dominate two separate pronounced constituents—have a special status for the syntax-prosody mapping. The reviewer notes that (45) yields the correct prosodic structure for examples like (41) above, repeated here as (46):

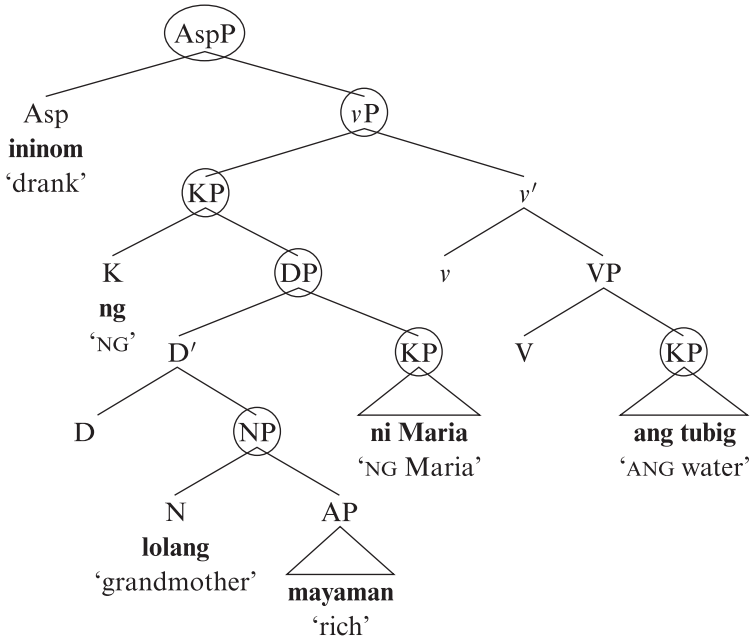
(46)



'Maria's rich grandmother drank the water'

The reviewer offers a tree essentially like the one in (47) for the sentence in (46). I have changed the reviewer's tree by adding branches for the morphemes *ng*, *ni*, and *ang*, which I have labeled K, and also by adding Asp(ect)P and *v*P:

(47)



In this tree, the branching maximal projections have been circled. Note that the NP *lolang mayaman* ‘rich grandmother’ has the N *lolang* and the AP *mayaman* as its daughters, and hence is a branching node. Note also that VP (for example) does not count as a branching node, in the relevant sense, since only one of its branches is pronounced.

We can represent the tree in (47) via the labeled bracketing in (48); the right brackets projected by branching nodes are the ones that are to be mapped onto prosodic boundaries, according to the reviewer’s theory, and I have put them in boldface:

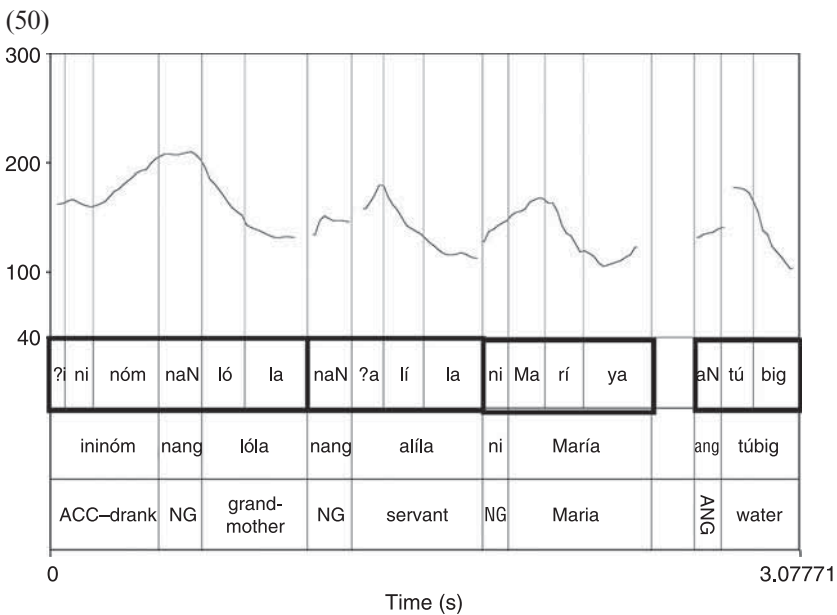
(48) [_{AspP}pininom [_{vP}[_{KP}ng [_{DP}[_{NP}lolang mayaman] [_{KP} ni
ACC-drank NG grandmother-LI rich NG
Maria]]] [_{vP}[_{KP}ang tubig]]]]
Maria ANG water
‘Maria’s rich grandmother drank the water’

Associating the right boundaries of branching nodes with Minor Phrase boundaries gives us the following prosodic structure:

- (49) (MinP (MinP
 [AspP Ininom [vP [KP ng [DP [NP lolang mayaman] [KP ni
 ACC-drank NG grandmother-LI rich NG
) (MinP)
 Maria]]] [vP [KP ang tubig]]])
 Maria ANG water
 ‘Maria’s rich grandmother drank the water’

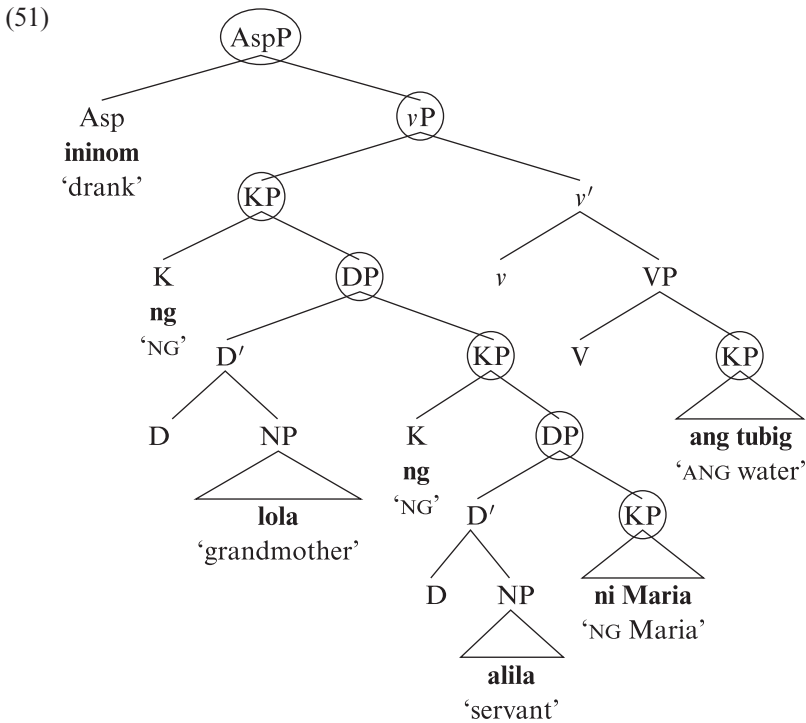
As the pitch track in (46) demonstrates, this is exactly the structure we want. The crucial property of the reviewer’s theory is that it is capable of associating the edge of NP with a prosodic boundary; because the NP *lolang mayaman* ‘rich grandmother’ is branching, it is associated with a prosodic boundary to its right. As the reviewer points out, the alternative theory he suggests offers a general theory of which nodes are to be mapped onto prosodic boundaries; I have so far avoided offering such a theory, relying instead on arbitrary references to particular nodes. Moreover, the reviewer’s theory, unlike mine, does not need to ‘erase’ any prosodic boundaries once they have been placed.

Unfortunately, although the reviewer’s theory performs well for this particular example, it fails to capture all of the data discussed here. Consider the example in (42), repeated here as (50):



‘Maria’s servant’s grandmother drank the water’

The sentence in (50) should have a tree like the one in (51); again, branching nodes are circled:



Again, we can represent the information in this tree with labeled brackets:

(52) [_{AspP}Ininom [_{vP}[_{KP}ng [_{DP}[_{NP}lola] [_{KP} ng [_{DP}[_{NP}alila] [_{KP}ni
 drank NG grandma NG servant NG
 Maria]]]]] [_{VP}[_{KP}ang tubig]]]]
 Maria ANG water
 'Maria's grandmother's servant drank the water'

Associating Minor Phrase boundaries with the right edge of every branching maximal projection gives us the following result:

(53) (_{MinP})
 [_{AspP}Ininom [_{vP}[_{KP}ng [_{DP}[_{NP}lola] [_{KP} ng [_{DP}[_{NP}alila] [_{KP}ni Maria]]]]]]]
 drank NG grandma NG servant NG Maria
 (_{MinP})
 [_{VP}[_{KP}ang tubig]]]]]
 ANG water
 'Maria's grandmother's servant drank the water'

The reviewer's algorithm divides this sentence into two Minor Phrases. But the pitch track in (50) shows that this is not the correct result; the subject should have Minor Phrase boundaries before each of the two possessors that it contains.

Thus, it appears that the reviewer's suggestion cannot cover all the Tagalog facts. On the other hand, I agree the reviewer that his proposal has one clear advantage over anything I have yet said. Rather than simply stipulating, as I have, that certain maximal projections and not others have their edges mapped onto Minor Phrase boundaries, he offers an algorithm for determining which maximal projections should be important for prosody; the algorithm associates Minor Phrase boundaries with the Right edges of all and only those maximal projections which immediately dominate multiple pronounced constituents (or, in the shorthand standardly used in the prosody literature, the maximal projections that "branch"). We have seen that this particular algorithm does not yield the right results, but it is clear that an algorithm is more desirable than a set of stipulations.

As the above examples show, the result that we want is to have Left edges of KPs (apart from the KP immediately following the verb) be associated with Minor Phrases. What special property of KPs could we appeal to to reach this result?

By the criteria developed in chapter 2, it seems clear that Tagalog is a language in which KP must be a phase. Arguments of nominals, for example, may be KPs:

- (54) *ang pagwawasak [ng lunsod]* (Tagalog)
 ANG destruction NG city
 'the destruction of the city'

If the reasoning in section 2.2.2.3 is correct, the KP *ng lunsod* 'NG city' must be a phase; Spell-Out of this KP protects the extended projection of the noun *lunsod* 'city' from being linearized together with the functional structure of the KP *ang pagwawasak* 'ANG destruction'.

We might capture the Tagalog facts, then, with the following generalization:

- (55) Left edges of phases are mapped onto Minor Phrase boundaries (and the Minor Phrase boundary immediately following the verb is deleted).

This generalization still contains a stipulation about the verb, which I am not yet in a position to dispense with. But it is like the reviewer's sug-

gestion in offering an algorithm, rather than just a stipulated list, for choosing maximal projections that are relevant for prosody. For more investigation of the idea that prosodic phrasing is directly linked to Multiple Spell-Out, see Dobashi 2004, Kahnemuyipour 2005, Ishihara 2007, Kratzer and Selkirk 2007, Pak 2008, and the references cited there. I return to the generalization in (55) in section 3.6.

Before concluding this section, I should also discuss a suggestion made by Sandra Chung (personal communication) for capturing the Tagalog data. She suggests that Tagalog could be described as a language which associates the Right edges of NPs with Minor Phrase boundaries. This proposal captures all of the Tagalog facts discussed here, without needing to postulate deletion of the phrase boundary immediately following the verb, as my proposal does. Because any KP will contain an NP, all KPs will come to have a Minor Phrase boundary at their right edge. If a KP contains a possessor, as in (56), the Right edge of the NP before the possessor will place a Minor Phrase boundary between the head noun and the possessor:

- (56) (MinP)(MinP
 [AspP Ininom [vP [KP ng [DP [NP lolang mayaman] [KP ni
 ACC-drank NG grandmother-LI rich NG
) (MinP)
 Maria]]] [vP [KP ang tubig]]]]
 Maria ANG water
 ‘Maria’s rich grandmother drank the water’

Just like the reviewer’s suggestion, then, Chung’s proposal captures the fact in (56) by allowing the edge of an NP to be mapped onto a prosodic boundary, and thereby avoids having to posit deletion of the Minor Phrase boundary following the verb. Her proposal also shares with my original proposal one of the properties to which the reviewer objected; namely, that it simply stipulates that the edge of a particular category is associated with a prosodic boundary, rather than giving a general theory of how categories are mapped onto prosody. If the idea that phases are the categories mapped onto prosodic domains turns out to be a viable one, then we may be able to avoid this kind of stipulation.

Even if Chung’s proposal turns out to be the best way to capture the Tagalog facts, we still predict that Tagalog *wh*-movement must be overt. Consider again the algorithm for building *wh*-domains, described in section 3.2:

- (57) a. For one end of the larger Minor Phrase, use a Minor Phrase boundary which was introduced by a *wh*-phrase.
 b. For the other end of the larger Minor Phrase, use any existing Minor Phrase boundary.

The first half of this algorithm, (57a), refers crucially to “a Minor Phrase boundary which was introduced by a *wh*-phrase.” If Chung is right, then Minor Phrase boundaries in Tagalog are in fact introduced not by KP or DP, but by NP. In fact, however, it seems reasonable to think that *wh*-phrases are not NPs, but KPs. It is certainly KPs which undergo *wh*-movement:

- (58) [_{KP}Sa aling simbahan] mo ibinigay ang pera? (Tagalog)
 SA which-LI church NG.you OBL-gave ANG money
 ‘To which church did you give the money?’

In (58), it is clearly the KP that *wh*-moves; movement of any subpart of this KP would be ungrammatical. If we were to use Chung’s way of accounting for the facts of Tagalog prosody, then, we would arrive at the result that Tagalog *wh*-phrases never project Minor Phrase boundaries at all; *wh*-phrases are KPs, and in Chung’s system, it is NPs that project Minor Phrase boundaries. Consequently, Tagalog should be unable to create *wh*-domains, even under Chung’s approach to Tagalog prosody.

In this section we have considered two alternatives to the account of Tagalog prosody given in section 3.3.3.1. One, offered by a reviewer, eventually failed to capture all of the Tagalog facts. The other, suggested by Sandra Chung, captures all of the Tagalog facts, but shares with my original proposal a need to stipulate particular nodes with which prosodic phrase boundaries are to be associated. I have suggested here that my original account can be made part of a more general theory of prosody, in which the maximal projections whose edges are mapped onto prosodic boundaries are specifically the phases. In what follows I will assume this account.

3.3.3.3 Tagalog Prosody and Tagalog *wh*-Movement The arguments of the previous two sections are meant to convince us that Tagalog prosodic phrasing makes crucial reference to Left edges of certain maximal projections (notably DPs, or perhaps more accurately KPs). Tagalog, as we saw earlier, is also a language in which the complementizer is initial. For the theory developed here, then, Tagalog is effectively the mirror image of

Basque; both the complementizer and prosodic phrase boundaries will be on the same side of any given *wh*-phrase (the Left side, in this case; the Right side, in the Basque case). As in Basque, then, Tagalog will be unable to create prosodic *wh*-domains. Recall that our algorithm for creating these domains requires us to use one of the prosodic boundaries introduced by the *wh*-phrase as one of the edges of the new prosodic *wh*-domain, with the opposite boundary freely chosen from any of the existing boundaries. Since the prosodic boundary introduced by a Tagalog *wh*-phrase will be one on the Left edge of the *wh*-phrase, the opposite prosodic boundary will have to be to the right of the *wh*-phrase. Since the complementizer is initial, it will necessarily precede the *wh*-phrase, and the *wh*-domain will therefore not include the complementizer. Tagalog, then, is not like Japanese; it cannot meet the conditions on *wh*-prosody by leaving the *wh*-phrase in situ and manipulating the prosody. Tagalog ought to have obligatory *wh*-movement to the left periphery. And indeed it does:

- (59) a. **Kailan** umuwi si Juan? (Tagalog)
 when NOM-went.home ANG Juan
 ‘When did Juan go home?’
 b. *Umuwi si Juan **kailan**?

In fact, there is one case in which Tagalog does seem to allow *wh* in situ. Recall that Tagalog verbs must be phrased with immediately following material; the general requirement that Left edges of KPs be mapped onto phrasal boundaries is suspended in just this case. We might expect, then, that Tagalog would allow *wh* in situ just in case the *wh*-phrase in question was immediately postverbal; in such a case, no phrasal boundaries would intervene between the *wh*-phrase and the beginning of the sentence.

This is not as generally true as we might wish. Still, Tagalog does have one *wh*-word, *nino* ‘who’, which can appear just in the positions the theory leads us to expect:

- (60) a. Ninakaw **nino** ang kotse mo? (Tagalog)
 ACC-stole NG.who ANG car your
 ‘Who stole your car?’
 b. *Ninakaw ang kotse mo **nino**?
 c. *Sinabi ng mga pulis [na ninakaw **nino** ang kotse mo]?
 ACC-said NG PL police LI ACC-stole NG.who ANG car your
 ‘Who did the police say stole your car?’

As the data in (60) show, *nino* can appear in immediate postverbal position (as in (46a)), but cannot be separated from the verb by another KP (as in (60b)); moreover, the verb it follows must be the verb of the clause where it takes scope (cf. (60c)).¹³

This option of *wh* in situ is more constrained in Tagalog than we ought to expect, however. For one thing, *nino* actually sounds best in contexts in which it is not followed by any material at all; while (60a) above is acceptable, and clearly better than (60b), (61) is even better (particularly when the direct object is salient and hence easily dropped, as in a response to a declaration like ‘someone has stolen my car’):

- (61) Ninakaw nino? (Tagalog)
 ACC-stole NG.who
 ‘Who stole it?’

For another thing, *nino* appears to be the only *wh*-word to have this option:

- (62) *Umuwi kailan si Juan? (Tagalog)
 NOM-went.home when ANG Juan
 ‘When did Juan go home?’

It is unclear, then, how fully we should embrace this prediction of our theory with respect to Tagalog. More broadly, however, the theory seems to make the right prediction about Tagalog; it predicts that Tagalog should be a *wh*-movement language, as indeed it is.

3.3.4 Chicheŵa: *Initial C, Minor Phrase Boundaries to the Right of Certain XPs*

The fourth and last case to be considered in this section is that of Chicheŵa; for work on the prosodic phrasing of Chicheŵa, see Bresnan and Kanerva 1989, Kanerva 1989, 1990, Truckenbrodt 1995, 1999, Seidl 2001, and the references cited there.

Kanerva (1989, 1990) discusses a number of tests for phonological phrasing in Chicheŵa. For example, he notes that the penultimate syllable of a phrase-final word undergoes lengthening (Kanerva 1990, 148):

- (63) a. mtengo uuwu ‘this price’ (Chicheŵa)
 b. mteengo ‘price’

Another rule, of Tone Retraction, retracts a phrase-final High tone to the penultimate syllable:

- (64) a. mlendó uuyu ‘this visitor’ (Chicheŵa)
 b. mleéndo ‘visitor’

Using tests like these, Truckenbrodt (1995, 1999) proposes that one of the factors determining phrasing in Chicheŵa is a mapping of Right edges of certain maximal projections onto prosodic domains. No phrase boundary intervenes, for example, between a noun and a following DP-internal maximal projection; the expressions in (65) consist of single phonological phrases (Truckenbrodt 1995, 76):

- (65) a. ⁿjingá yá mwáána (Chicheŵa)
 bicycle of child
 b. ⁿjingá yábwiino
 bicycle good

Similarly, no phrase boundary intervenes between a preposition and a following DP; the expression in (66) is a single phonological phrase:

- (66) ^mpáká máawa (Chicheŵa)
 until tomorrow

Thus, left edges of PPs (as in (65a)), APs (as in (65b)), and DPs (as in (66)) are not mapped onto prosodic boundaries. On the other hand, subjects are separated from the VP by a phrase boundary, and coordinated DPs are also in separate phrases:

- (67) a. [fíisi] [anadyá mkáaⁿgo] (Chicheŵa)
 hyena ate lion
 b. [miléeme] [ⁿdi ⁿjúuchi]
 bats and bees

The data in (67) can be accounted for, Truckenbrodt points out, if we map right edges of DPs onto prosodic boundaries; the initial DP in both of these examples is separated from following material by this boundary.

Chicheŵa, then, is a language that maps Right edges of certain maximal projections onto prosodic boundaries. It is also a head-initial language, as the preceding examples reveal, with head-initial PP (as in (66)) and VP (as in (67a)). More importantly for our purposes, Chicheŵa complementizers precede the clauses they introduce (Bresnan and Kanerva 1989, 10):

- (68) Zikugáníziridwá [kúti átsíbwéni ángá ndi afiti] (Chicheŵa)
 it.is.thought that uncle my be witch
 ‘It is thought that my uncle is a practitioner of witchcraft’

We have seen that Chicheŵa has initial complementizers and marks Right edges of certain maximal projections with prosodic boundaries. On the theory developed here, this makes Chicheŵa the mirror image of Japanese; a given *wh*-phrase will typically have the complementizer on one side (preceding it, in Chicheŵa; following it, in Japanese) and a phonological phrase boundary on the other (following it, in Chicheŵa; preceding it, in Japanese). Our algorithm for the creation of prosodic *wh*-domains thus allows Chicheŵa, like Japanese, to manipulate the prosody in ways that create a prosodically acceptable *wh*-question without movement. In other words, Chicheŵa ought to have the option of *wh* in situ. This is correct:

- (69) anaményá **chiyáani** ndí mwáálá (Chicheŵa)
 he.hit what with rock (Downing 2005)
 ‘What did he hit with the rock?’

In fact, a variety of researchers (Kanerva 1989, 1990, Truckenbrodt 1995, 1999, and Downing 2005) have noted that Chicheŵa does manipulate the prosody of focus constructions and *wh*-questions in a way that is compatible with this theory. A difficulty for the account of Chicheŵa prosodic phrasing sketched here arises when we consider the phrasing of VPs; typically, VPs have no prosodic boundaries inside them. The VP in (70), for example, is a single prosodic phrase:

- (70) (anaményá nyumbá ndí mwáála) (Chicheŵa)
 he.hit house with rock
 ‘He hit the house with the rock’

If all Right edges of DPs are to be mapped onto prosodic boundaries, then we ought to expect to find a prosodic boundary after the DP *nyumbá* ‘house’, but this is not what we find. Truckenbrodt (1995, 1999) develops an Optimality-Theoretic account of the facts; in his approach, a constraint Wrap-XP demands that the VP be phrased as a unit, outranking the constraint that would normally place a prosodic boundary after the direct object (though see Seidl 2001 and McGinnis 2001 for criticisms of Truckenbrodt’s approach).

Whatever account of the VP phrasing might turn out to be the right one, it is of interest that in *wh* in situ contexts, the expected phrasing can reassert itself:

- (71) (anaményá **chiyáani**)(ndí mwáálá) (Chicheŵa)
 he.hit what with rock (Downing 2005)
 ‘What did he hit with the rock?’

Here the expected prosodic boundary after the direct object reappears. Recall that the algorithm for creation of prosodic *wh*-domains involves taking as one boundary for the *wh*-domain a prosodic boundary projected by the *wh*-phrase. In the case of (71), the relevant boundary is the one after the *wh*-phrase *chiyáani* ‘what’. For whatever reason, this boundary is not ordinarily expressed in VP-medial position, but in *wh* in situ contexts it does appear, as we expect.

Here it may be useful to revisit the claim being made in this chapter about the prosodic representation of *wh* in situ. In section 3.2, I claimed, following Kubozono 2006, that the prosody of Japanese *wh* in situ should be represented as in (72):

$$(72) \begin{array}{cccc} [DP &] & [[DP \textit{wh}] &] & C \\ (\text{MinP}) & & (\text{MinP}) & & \\ & & (\text{MinP}) & & \end{array}$$

Following much careful work on the prosody of Japanese *wh*-questions, I claimed that Japanese *wh* in situ triggers the creation of a ‘*wh*-domain’, a larger prosodic phrase connecting the *wh*-phrase with the sentence-final complementizer, which is overlaid on the ordinary prosody of the sentence. In (72) above, this *wh*-domain is represented as the large Minor Phrase in the bottom line. As I showed in section 3.1, prosodic representations like the one in (72) receive different phonetic interpretations in different languages. In Tokyo Japanese, for instance, the prosodic structure in (72) is realized with pitch compression over the entire *wh*-domain, though the smaller Minor Phrase breaks represented on the second line of (72) can still be detected through careful acoustic work (see Ishihara 2003 and Sugahara 2003 for discussion of such work). In other dialects of Japanese, the *wh*-domain has different phonetic effects; the particular example we saw was Fukuoka Japanese, in which the *wh*-domain is associated with a high tone. As I pointed out in section 3.1, the claim of this chapter is about phonological representations like the one in (72), and not about their phonetic realizations, which can vary from language to language. In fact, as far as this theory is concerned, there could be languages in which the *wh*-domain has no phonetic effects at all.

In this section I have claimed that Chicheŵa *wh* in situ should be associated with a prosodic representation very similar to the Japanese one in (72):

$$(73) \begin{array}{cccc} C & [DP &] & [[DP \textit{wh}] &] & [DP &] \\ (\text{MinP}) & & (\text{MinP}) & & (\text{MinP}) & & \\ & & (\text{MinP}) & & & & \end{array}$$

The phonetic facts from Chicheŵa discussed above amount to evidence that the prosodic boundary following the *wh*-phrase is always retained, even in contexts, like the middle of a VP, in which Chicheŵa generally deletes prosodic boundaries (or, at any rate, does not express such boundaries phonetically). The proposal was that the prosodic boundary after the *wh*-phrase is retained, even in such contexts, in order to make the creation of a *wh*-domain possible.

A reviewer notes (and see also Wagner 2005 and Dobashi 2006 for discussion) that *wh*-domains like the one in Chicheŵa, which extend to the left of the phrase that triggers them, appear never to be phonetically realized with pitch compression, in the way that the Tokyo Japanese *wh*-domain is. If true, this is a very interesting asymmetry, though not one I have anything to say about. The claims defended here would certainly be bolstered if a *wh*-domain of the Chicheŵa type, in some language that exhibits it, could be shown to have some phonetic effect on all the material inside it.

3.4 Interlude: More Wrap

In the preceding sections, I developed a theory that predicts, for any given language, whether that language will be able to create prosodic *wh*-domains, and hence be able to leave *wh*-phrases in situ. I claimed that we can predict this from the position of the complementizer, together with the general alignment of prosodic boundaries. Languages in which the complementizer is on one side of the clause, and prosodic boundaries are associated with the opposite side of certain maximal projections, I claimed, are the languages that can create *wh*-domains. Thus, we find *wh*-domains in languages like Japanese, in which the complementizer is on the Right edge of the clause and prosodic boundaries are associated with the Left edges of DPs, and also in languages like Chicheŵa, in which the complementizer is on the Left edge of the clause and prosodic boundaries are associated with the Right edges of DPs.

A reviewer suggests that this proposal is doomed to eventual failure. A more comprehensive investigation of prosodic systems, he claims, will eventually find fatal counterexamples. He proposes a third parameter distinguishing between languages, having to do with the constraint Wrap that appeared in the discussion of Chicheŵa, in section 3.3.4.

We saw in that section that the Chicheŵa VP typically contains no prosodic boundaries (though, as we also saw, these prosodic boundaries can

reappear if required to do so by focus). As we noted, this fact has been captured by Truckenbrodt (1995, 1999) by means of a constraint *Wrap*, which demands that the VP be phrased as a single prosodic domain. In a language like Chicheŵa, on Truckenbrodt's account, *Wrap* outranks the constraints that would ordinarily align the edges of the VP-internal DPs with prosodic boundaries, causing those boundaries to disappear.

The reviewer suggests that the typology developed above should be supplemented with another parameter; some languages have the *Wrap* constraint ranked high in an Optimality-Theoretic hierarchy of constraints, and others do not. Only languages with high-ranking *Wrap*, the reviewer suggests, may construct *wh*-domains. Thus, the reviewer's idea would restrict further the class of languages in which *wh* in situ is possible. In order to have *wh* in situ, if the reviewer is correct, languages must not only have the properties described in the previous sections, but must also have high-ranking *Wrap*.

The reviewer may well turn out to be correct in his claim that the proposal developed in the preceding sections is empirically inadequate. The theory will clearly have to be tested against a wider range of languages. In the remainder of this section, I will try to show why we should not immediately adopt the reviewer's suggestion, though of course we may discover the need for something like it in future work.

Truckenbrodt (1995, 1999) and Seidl (2001) discuss a number of Bantu languages, which vary in their ranking for Truckenbrodt's *Wrap* constraint; that is, some of these languages are like Chicheŵa in that the VP is typically phrased as a single unit, and others are not. They offer, for example, the following phrasings for VPs containing two DPs (see Truckenbrodt 1995, 1999, and Seidl 2001 for arguments for these structures):

- (74) a. (V DP)(DP) (Swahili)
(Seidl 2001)
 b. ((V DP) DP) (Kimatuumbi)
(Truckenbrodt 1999)
 c. (V DP DP) (Kikuyu)
(Seidl 2001)
 d. (V DP DP) (Chicheŵa)
(Truckenbrodt 1999, Seidl 2001)

All of these languages assign prosodic boundaries to Right edges of maximal projections. On Truckenbrodt's theory, they differ in the ranking of *Wrap*. In Swahili, *Wrap* is ranked quite low, so that it is outranked by the

constraint which aligns maximal projections with prosodic boundaries, and we therefore find a prosodic boundary between the two VP-internal objects. The other three languages listed above have Wrap highly ranked; in Kimatuumbi, on Truckenbrodt's theory, Wrap is so highly ranked that it outranks another constraint which militates against recursive structures, and in Kikuyu and Chicheŵa Wrap outranks the constraint that rewards alignment of maximal projections with prosodic boundaries.

Although these languages differ in how they rank Wrap, they are identical in one respect: they all allow *wh* in situ:

- (75) a. A-na-taka u-tumi-e dawa
 1s-PRES-want 2ss-take-SUBJ medicine
 gani? (Swahili)
 what (Hinnebusch and Mirza 1979)
 'What kind of medicine does he want you to take?'
 b. A-tel-ĩke námani? (Kimatuumbi)
 1s-cook-ASP what (Odden 1996, 62)
 'What did he cook?'
 c. Abdul a-ra-nyu-ir-ε kee? (Kikuyu)
 Abdul 1s-TNS-drink-ASP-FV what (Schwartz 2007, 140)
 'What did Abdul drink?'
 d. A-na-mény-á chiyáani ndi mwáálá? (Chicheŵa)
 1s-TNS-hit-FV what with rock (Downing 2005)
 'What did he hit with the rock?'

It appears that the Bantu languages quite generally allow *wh* in situ, regardless of the ranking of Wrap. Thus, the reviewer's proposal, that a language must have high-ranked Wrap in order to construct *wh*-domains (and hence, license *wh* in situ), seems unsupported, at least in its simplest form.

Of course, one could imagine positing multiple versions of Wrap, which would be responsible for different parts of the clause, or for different levels of prosodic structure. In fact, there could be a version of Wrap that was responsible solely for the creation of *wh*-domains. Such a version of Wrap would amount to a stipulation that certain languages allow *wh* in situ and others do not.

As I mentioned at the outset of this chapter, this type of stipulation has a long tradition in the theory, and it may indeed turn out to be the best we can do. For the time being, however, I will continue to pursue the hope that we can construct a predictive theory of the distribution of strategies for *wh*-question formation.

3.5 Possible Further Directions

In section 3.3, I discussed one language from each of the four possible types outlined by this theory. The languages are given in the table in (76):

(76)

	C to right of TP	C to left of TP
Prosodic boundaries on right of XPs	Basque	Chicheŵa
Prosodic boundaries on left of XPs	Japanese	Tagalog

Wh-questions in these languages are constrained by a requirement that the *wh*-phrase be separated from the complementizer where it takes scope by as few Minor Phrase boundaries as possible, for some level of Minor Phrasing. An algorithm for the creation of new Minor Phrases allows some languages to satisfy this condition without movement; the algorithm is given again in (77) (repeated from (10)):

- (77) a. For one end of the larger Minor Phrase, use a Minor Phrase boundary which was introduced by a *wh*-phrase.
 b. For the other end of the larger Minor Phrase, use any existing Minor Phrase boundary.

Whether the algorithm in (77) can improve the prosody of the structure depends on whether the Minor Phrase boundaries introduced by *wh*-phrases intervene between *wh*-phrases and the associated complementizer or not. In the shaded cells in the tree in (76), they do not; the complementizer and the phonological phrase boundaries associated with maximal projections are on opposite sides of the *wh*-phrase. These are therefore languages that allow *wh* in situ, since their typical rules for creation of prosody allow the creation of acceptable prosodic structures for *wh*-questions. The languages in the unshaded cells, by contrast, must resort to movement to improve the structure; each must do whatever it can to move the *wh*-phrase and the associated complementizer closer together. In the case of Basque and languages like it, the result of this will be that the *wh*-phrase must be as far right as possible (immediately preverbal, in the particular case of Basque), while in the more familiar case of Tagalog, *wh*-movement will be to the left periphery of the clause.

In what follows we will consider how this general approach might be extended to some other cases.

3.5.1 Spanish

Uribe-Etxebarria (2002) and Reglero (2005) note an interesting condition on *wh* in situ in some dialects of Spanish. For some speakers, *wh* in situ is apparently acceptable in examples like (78):

- (78) a. Juan compró qué? (Spanish)
 Juan bought what
 b. Tú le diste la guitarra a quién?
 you CL gave the guitar to who

Crucially, these are examples in which the *wh*-phrases are utterance-final. The *wh*-phrase may also be utterance-medial, for these speakers, but must be followed by a ‘pause’:

- (79) Tú le diste a quién *(#) la guitarra? (Spanish)
 you CL gave to whom the guitar

The example in (79) cannot be given the ordinary non-*wh* intonation, in which the indirect object is immediately followed by the direct object; the *wh*-phrase must be followed by an intonation break.

Here I am hampered by my ignorance of Spanish intonation. But one possibility is that Spanish is essentially like Chicheŵa: a complementizer-initial language in which *wh* in situ is possible, just when a prosodic break appears just after the *wh*-phrase. The phonetic implementation of the prosodic break in Spanish is not the same as the one in Chicheŵa, but this is a situation we have already seen in section 3.1.1, when we compared the *wh*-intonation of Tokyo Japanese to that of Fukuoka Japanese. The theory under development here is concerned only with prosodic structure, not with phonetic implementation.

3.5.2 Bangla

Bayer (1996), Simpson and Bhattacharya (2003) discuss conditions on the position of *wh*-phrases in Bangla (also called Bengali). Descriptively speaking, it appears that *wh*-phrases must linearly precede the complementizer where they take scope. Before we begin discussing Bangla, however, it will be useful to return briefly to Japanese.

Although Japanese is quite straightforwardly head-final, it does have a form of extraposition that can move phrases to postverbal position, as we saw in section 2.3.2 (and see Endo 1996 and Murayama 1998 for further discussion):

- (80) John-wa katta yo, ano hon-o (Japanese)
 John-TOP bought ASSERTION that book-ACC
 ‘John bought (it), that book’

Clauses, both declarative and interrogative, can also be extraposed in this way (Takako Iseda, personal communication):

- (81) a. John-wa shinjiteiru yo, [Mary-ga dokushin da
 John-TOP believes ASSERTION Mary-NOM single is
 tte] (Japanese)
 that
 ‘John believes that Mary is single’
 b. Keesatsu-wa shirabeteiru yo, [dare-ga okane-o
 police-TOP investigating ASSERTION who-NOM money-ACC
 nusunda ka]
 stole Q
 ‘The police are investigating who stole the money’

And a matrix clause which is itself a question may exhibit rightward extraposition of an embedded clause:

- (82) John-wa shinjiteiru no, [Mary-ga dokushin da tte]? (Japanese)
 John-TOP believes Q Mary-NOM single is that
 ‘Does John believe that Mary is single?’

However, a *wh*-phrase in an extraposed clause may not take matrix scope:

- (83) *John-wa shinjiteiru no, [dare-ga dokushin da tte]? (Japanese)
 John-TOP believes Q who-NOM single is that
 ‘Who does John believe [__ is single]?’

Without extraposition, of course, such a sentence is well formed:

- (84) John-wa [dare-ga dokushin da tte] shinjiteiru no? (Japanese)
 John-TOP who-NOM single is that believes Q
 ‘Who does John believe [__ is single]?’

In Japanese, then, just as our theory predicts, *wh*-phrases are required to linearly precede the complementizer at which they take scope. Rightward extraposition moves phrases to the right of the matrix complementizer, with the consequence that rightward extraposition of *wh*-phrases, or of any phrase containing *wh*-phrases, makes matrix scope for those *wh*-phrases impossible.

Next we can turn to Bangla. Bangla is generally head-final (see Bayer 1996, 252–254, for arguments and discussion; Bangla has postpositions, and verbs that follow most of their complements except in marked orders). However, complement clauses may either precede or follow their selecting verb (Bayer 1996, 254):

- (85) a. chele-Ta jane na [baba aSbe] (Bangla)
 boy-CLASSIFIER know.3 not father will.come
 ‘The boy doesn’t know that (his) father will come’
 b. chele-Ta [baba aSbe] jane na

One difference between Bangla and Japanese is that the matrix complementizer in Bangla is null, which means that we cannot directly determine the relative order of the matrix complementizer and the extraposed clause. In Japanese, as we saw, the extraposed clause is verifiably to the right of the matrix complementizer ((82), repeated as (86)):

- (86) John-wa shinjiteiru no, [Mary-ga dokushin da tte]? (Japanese)
 John-TOP believes Q Mary-NOM single is that
 ‘Does John believe that Mary is single?’

As we will see, the Bangla facts will follow if we assume that Bangla and Japanese are the same in this respect.

In preverbal complement clauses, Bangla *wh*-phrases may take either embedded or matrix scope (Bayer 1996, 272):

- (87) ora [ke aSbe] Suneche (Bangla)
 they who will.come heard
 ‘Who have they heard will come?’ (*matrix*)
 ‘They have heard who will come’ (*embedded*)

In postverbal complement clauses, by contrast, Bangla *wh*-phrases must take embedded scope (Bayer 1996, 273):

- (88) ora Suneche [ke aSbe] (Bangla)
 they heard who will.come
 ‘They have heard who will come’ (*embedded only*)

For some Bangla speakers, at least, *wh*-phrases from postverbal clauses may take matrix scope by being moved into the matrix clause (Simpson and Bhattacharya 2003, 133¹⁴):

- (89) jOn ke bollo [__ cole gEche]? (Bangla)
 John who said left gone
 ‘Who did John say left?’

The generalization, then, appears to be that a *wh*-word in Bangla may take scope in a clause just if it linearly precedes the verb (and, this theory leads us to hope, the postverbal complementizer) of that clause.¹⁵ *Wh*-phrases from embedded clauses may take matrix scope just if the embedded clause precedes the matrix verb (as in (87)) or if the *wh*-phrase itself is moved to a preverbal position in the matrix clause (as in (89)). Otherwise, only embedded scope is possible (as in (88)).

This pattern can be made to fit into the theory developed here, on two additional assumptions. One is about the nature of Bangla prosody, which will need to be relevantly like that of Japanese—that is, it will have to insert prosodic phrase boundaries at Left edges of certain maximal projections. The other is about the position of the complementizer to which *wh*-phrases are to be related. This will have to immediately follow the verb of its clause (again, just as in Japanese).

We will shortly see some evidence for the first of these assumptions, but first let us consider how the assumptions help us to derive the facts. Consider first the possible readings of an example like (87), repeated as (90) (with the phonologically null complementizers added, just where they would be in the corresponding Japanese sentences):

- (90) ora [**ke** aSbe C] Suneche C (Bangla)
 they who will.come heard
 ‘Who have they heard will come?’ (*matrix*)
 ‘They have heard who will come’ (*embedded*)

If Bangla, like Japanese, places phonological phrase boundaries at Left edges of DPs, then the DP *ke* ‘who’ will have a phrase boundary to its Left. Consequently, we can use the procedure for creating prosodic *wh*-domains to connect *ke* with either of the two complementizers; the phrase boundary to the left of *ke* will be one edge of the *wh*-domain, and the other boundary will be whatever boundary is present to the right of the relevant complementizer. In other words, the *wh*-phrase in this type of example ought to be able to take scope at either complementizer, as indeed it can.

Next, consider (88), repeated as (91):

- (91) ora Suneche C [**ke** aSbe C] (Bangla)
 they heard who will.come
 ‘They have heard who will come’ (*embedded only*)

If we apply the procedure for creating *wh*-domains to an example like (91), the *wh*-domain will start at the Left edge of *ke* ‘who’ and extend as

far right as necessary to include a complementizer where the *wh*-phrase can take scope. As it happens, there is only one complementizer to the right of *ke* in (91), and hence *ke* can only take scope in this position. If the complementizers in (91) are placed correctly, and if Bangla prosody is like Japanese prosody in this respect, then we have the result we want.

It has in fact been argued that Bangla prosody is not unlike Japanese prosody in the respects that are relevant for this theory. Hayes and Lahiri (1991), Michaels and Nelson (2004), and Selkirk (2006) describe a system for Bangla prosody that typically places prosodic boundaries at Left edges of certain maximal projections; the examples in (92), which would form single phonological phrases, are from Hayes and Lahiri 1991, 87–88:¹⁶

- (92) a. [[ram-er] Taka] (Bangla)
 Ram-GEN money
 ‘Ram’s money’
 b. [[chobi-r] jonno]
 pictures-GEN for
 ‘for pictures’
 c. [[[Tok gur-er] jonno] durgOndho]
 sour molasses-GEN for bad.smell
 ‘the bad smell of sour molasses’

All of these examples have DPs contained in larger structures; in (92a), for example, the DP possessor *ram-er* ‘Ram’s’ is followed by the noun *Taka* ‘money’. These DPs are not, however, followed by prosodic breaks, which shows that Right edges of DPs are not typically associated with breaks in prosody.

To see what syntactic boundaries are mapped onto prosodic boundaries, we can consider the phrasing of examples like (93), where the phrasing is indicated by parentheses:

- (93) (Omor) (cador)(tara-ke) (dieche) (Bangla)
 Amor scarf Tara-DAT gave
 ‘Amor gave the scarf to Tara’

The phrasing in (93) shows, first, that Bangla is like Basque in that it places a prosodic break just before the verb. Second, we can see in (93) that although Right edges of DPs may not be associated with prosodic breaks (as (92) showed us), Left edges of DPs apparently are.

The second of these is the more important one from our perspective; we are concerned with how edges of maximal projections are typically

mapped onto prosodic domains, since it is these maximal projections that may be *wh*-phrases and will therefore potentially determine one edge of a prosodic *wh*-domain. The anomalous prosodic break before the verb makes Bangla resemble Basque (and in fact allows Bangla to join the majority of the languages discussed in this chapter, almost all of which seem to treat the verb as some kind of exception to the general pattern), but this is a red herring, on the theory developed here; the preverbal break will never be one projected by a *wh*-phrase, and hence will never determine the position of such a phrase. This is a good result, since Bangla *wh*-phrases are not constrained, as their Basque counterparts are, to appear in immediately preverbal position¹⁷ (Simpson and Bhattacharya 2003, 137):

- (94) jOn **kon** **boi-Ta** borders-e kal kinlo (Bangla)
 John which book-CLASSIFIER Borders-LOC yesterday bought
 ‘Which book did John buy yesterday at Borders?’

Thus far, Bangla intonation appears to be relevantly like Japanese intonation, in that Left edges of certain maximal projections (such as DPs) are mapped onto prosodic boundaries. In cases in which a Bangla *wh*-phrase precedes a complementizer, then, Bangla ought to be able, like Japanese, to create a prosodic *wh*-domain extending from the *wh*-phrase to the complementizer, and thus allow the *wh*-phrase to take scope at the complementizer without movement.

In fact, Hayes and Lahiri (1991), Michaels and Nelson (2004), and Selkirk (2006) do discuss data that may support the idea that these Bangla *wh*-questions involve the creation of prosodic *wh*-domains. The main concern of these researchers is actually with focus, rather than with *wh* in situ (though Hayes and Lahiri do suggest that *wh* in situ has the same prosody as focus). What they show is that focus on a particular phrase is characterized by loss of prosodic boundaries after that phrase. Focus has other prosodic consequences, however, which are less congenial to the theory developed here; in particular, a focused phrase is apparently always immediately *followed* by a prosodic break. Given the complicated nature of the data, and the fact that the data are primarily about focus and not *wh*-questions, I will leave this as an issue for future work on Bangla intonation. The point of interest, from our perspective, is simply that Bangla seems to have the right type of prosody to allow *wh*-phrases to remain in situ, just when they precede the complementizer where they take scope. In other words, Bangla has the potential to be just like Japanese, as far as this theory is concerned.

3.5.3 French, Portuguese

French and Portuguese can both form *wh*-questions either via movement or with *wh* in situ:

- (95) a. Tu as vu qui? (French)
 you have seen who
 ‘Who did you see?’
 b. Qui tu as vu?
- (96) a. O Bill comprou o que? (Portuguese)
 D Bill bought D what (Pires and Taylor 2007, 2)
 ‘What did Bill buy?’
 b. O que o Bill comprou?
 D what D Bill bought

Both of these languages have head-initial complementizers:

- (97) a. Guillaume croit [que Pierre aime Marie] (French)
 Guillaume believes that Pierre loves Marie
 ‘Guillaume believes that Pierre loves Marie’
 b. O Pedro disse [que ele leu o quê?] (Portuguese)
 D Pedro said that he read D what (Pires and Taylor 2007, 9)
 ‘What did Pedro say that he read?’

Thus, the theory developed here leads us to hope that both languages ought to be metrically like Chicheŵa, as outlined in section 3.3.4—that is, they ought to be languages in which Right edges of maximal projections are typically associated with metrical boundaries. French and Portuguese would then be able to leave *wh* in situ by building a *wh*-domain with one of its boundaries at the right edge of the *wh*-phrase, and its other boundary at the beginning of the clause.

Both languages have indeed been claimed to impose metrical boundaries at Right edges of maximal projections. Selkirk (1986), for example, makes this claim for French, on the basis of properties of liaison. Liaison causes underlying consonants to appear whenever followed by a vowel-initial word with no intervening prosodic boundary. In (98), for example, the boldfaced consonants undergo liaison and are pronounced:

- (98) (Ces très amiables enfants)(**en** ont
 these very nice children of.it have
 avalé) (French)
 swallowed (Selkirk 1986, 395)
 ‘These very nice children swallowed some of it’

Sandalo and Truckenbrodt (2002) claim that Brazilian Portuguese also creates prosodic structure by assigning prosodic boundaries at right edges of maximal projections. The phenomenon they use to study Portuguese prosody is stress retraction under stress clash: a word with final stress will retract stress to the penultimate syllable, if the word is followed by a word with initial stress, and the two words are not separated by prosodic boundaries. In the following examples, stress is indicated by underlining:

- (99) a. (O café quente)(queimou a boca
 the coffee hot burned the mouth
 ontem) (Brazilian Portuguese)
 yesterday
 ‘The hot coffee burned my mouth yesterday’
 b. (O novo café) (queima a boca sempre)
 the new coffee burns the mouth always
 ‘The new coffee burns my mouth always’

Thus, stress retraction takes place in (99a), because the head noun and the following adjective share a prosodic phrase, but not in (99b), in which the subject and the verb are separated by a phrase boundary.

These two languages are therefore predicted to allow either *wh*-movement or *wh* in situ, as indeed they do. Particularly for French, there is clearly much more to say; for instance, French *wh* in situ appears to be unable to cross tensed clause boundaries (Chang 1997; Bošković 1998; Reglero 2005):

- (100) a. Qu’a dit Peter que John a acheté? (French)
 what-has said Peter that John has bought
 ‘What did Peter say that John bought?’
 b. *Peter a dit que John a acheté quoi?
 Peter has said that John has bought what

The same is not true of Portuguese (Pires and Taylor 2007, 10):

- (101) O João e o Pedro acham que a Maria viu
 the João and the Pedro think that the Maria saw
 quem? (Portuguese)
 whom
 ‘Who do João and Pedro think that Maria saw?’

It is possible that some of the conditions on *wh* in situ in these languages are related to conditions to the prosody of the *wh*-domain (see, in

particular, Cheng and Rooryck 2000 as well as Hamlaoui 2008 for discussion of this possibility for French).

3.5.4 Echo Questions

Many languages with overt *wh*-movement allow *wh* in situ just in the case of “echo questions” like the one in (102b):

- (102) a. John bought a motorcycle.
 b. John bought a **WHAT?**

In fact, this exception for echo-questions is extremely widespread, though perhaps not universal. Comorovski (1996) and Bošković (2001) claim that echo questions are impossible in Romanian, for example:

- (103) *Ion a adus ce? (Romanian)
 Ion has brought what
 ‘John brought what?’

Still, it is quite common to find *wh* in situ just for echo questions.

In a theory which posits strength and weakness, it is unclear why this should be so. We could, for example, claim that English has an ordinary interrogative complementizer with a strong feature, and an “echo question” complementizer with a weak feature. While this would get the English fact, it seems to miss the point, which is that (a) the English pattern is extremely common, and (b) the reverse is (as far as I know) unattested; there are no *wh* in situ languages that require movement just for echo questions. A more interesting tack might be to claim that echo questions lack complementizers at all, and hence lack a Probe for the *wh*-phrase; this approach would be left with the burden of explaining how such questions can be interpreted as questions.

The theory developed here allows us to make another kind of move. Echo questions are typically questions in which all the material, apart from the *wh*-phrase itself, is old information; in fact, this material is the limiting case of old information, in the sense that it is typically a repetition, sometimes with slight rephrasing, of something previously said. This results in the destressing of all the non-*wh* material, indicated in (103b) by small type.¹⁸ This chapter has proposed that *wh*-phrases must be separated from the complementizer at which they take scope by as few prosodic boundaries (of a certain type) as possible. The bulk of the chapter has concentrated on two main strategies for achieving this: movement of the *wh*-phrase closer to the complementizer, and creation of a new Minor Phrase, making use of existing boundaries.

In an example like (103b), we might be seeing a third kind of strategy. It is possible, at least, that the destressing of all the non-*wh*-material in the sentence reflects a lack of prosodic structure; this old information, on this type of account, is not assigned the type of prosodic structure that it would be if it were new information. Consequently, (103b) might be a prosodically well-formed *wh*-question to begin with; there might be no offending prosodic boundaries between the *wh*-phrase and the complementizer.

At the moment, this is speculation; I have no facts to offer about the prosody of echo questions that would support this. The account does have the virtue, however, of explaining why echo questions are associated with *wh* in situ, and why there are no languages in which echo questions are associated with movement not found in non-echo questions. The properties of echo questions, on this type of account, are linked to the fact that old information tends (universally?) to be prosodically bleached, and hence to make the creation of a prosodically well-formed *wh*-question easier, even in languages that must normally resort to *wh*-movement.

3.6 Conclusion

I began this chapter by noting that languages seem to differ in how they form their *wh*-questions. The chapter has been an exploration of the idea that this is in fact false. Languages do not vary in how they form their *wh*-questions; in every language, *wh*-questions are formed by arranging for the *wh*-phrase and the complementizer associated with it to be separated by as few (Minor) phrase boundaries as possible, for some level of Minor phrasing.

How this universal goal is achieved, of course, is in fact a matter of crosslinguistic variation. But the crosslinguistic variation appears to follow, once the universal goal is stated in this way; languages treat their *wh*-phrases differently because their complementizers are in different places, and because the basic rules for how prosodic structures are formed can differ from language to language. Languages (like Japanese, Chicheŵa, and possibly Spanish, French, Portuguese, and Bangla) that place complementizers on one side of *wh*-phrases and habitually map the other side onto prosodic boundaries are able to satisfy the prosodic conditions on *wh*-questions without movement, and hence can leave *wh*-phrases in situ. Languages that place the complementizer and the prosodic boundaries on the same side of maximal projections (such as Basque, Tagalog, and hopefully English) cannot directly manipulate the prosody in this

way, and must resort to movement, doing everything possible to bring the *wh*-phrase and the complementizer closer together.

Much work remains to be done, of course. The theory will need to be tested on many more languages than the handful that I have managed to apply it to here; for many languages, this will require study of the basic mapping of syntax onto prosody. I have not attempted to apply this theory to multiple-*wh* questions, another domain of crosslinguistic variation, which needs further study.

Ultimately, the hope is to apply this way of thinking to other types of movement, as well. We have grown accustomed to being able to stipulate that this or that type of movement (not only *wh*-movement, but also scrambling, head movement of the verb to T, and so on) is present or absent in a given language. The idea here has been to derive this apparent parameter from other parameters, just in the case of *wh*-movement. If this attempt proves successful, then we need to undertake the same project for other types of movement. In general, the goal should simply be the general one of linguistics: to describe languages in such a way that, properly understood, they do not differ, at least not in as many ways as one might at first think.

At the beginning of this chapter I raised a “look-ahead” problem associated with this theory: what is the right way of understanding the interactions between the syntax and the phonology, such that conditions on the prosody dictate how the syntax is to treat *wh*-phrases? In my opinion, it is probably too early to try to answer this question, though it is sure to be a pressing one if the research program outlined here continues. One important part of seeking a solution will be developing a better understanding of what types of phonological information the syntax is allowed to “respond” to. I have been claiming in this chapter that syntactic operations can in part be triggered by considerations of prosody, but I suspect that not all properties of phonology can influence the syntax in this way; we will probably not find movements triggered by the need to put onsetless syllables in positions where they can acquire onsets from preceding consonant-final words, for example. If this turns out to be correct, then we probably do not want to solve the “look-ahead” problem by brute force, allowing the syntax full access to the information in the phonological representation.

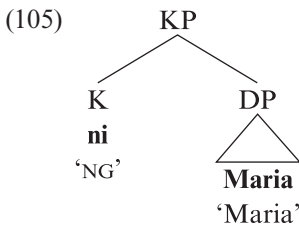
In section 3.3.3.2, I briefly addressed the question of how we ought to choose the particular maximal projections that are mapped onto prosodic boundaries. I suggested there that the maximal projections that are relevant for prosody might be specifically the phases. The example under

consideration there was Tagalog; we saw evidence that KPs are phases in Tagalog, and I showed that an algorithm mapping left edges of KPs onto Minor Phrase boundaries, together with deletion of the boundary immediately following the verb, could account for the Tagalog data.

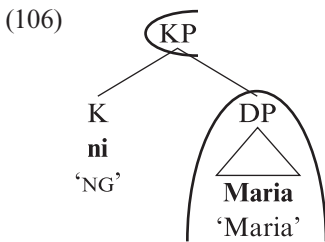
In chapter 2, it was important that Spell-Out take place along the lines developed by Nissenbaum (2000); when a phase is completed, all the material in the phase except for the edge is sent to PF, while the material at the edge remains part of the syntactic computation. Suppose this process of Spell-Out is also responsible for inserting prosodic boundaries (or objects which will be interpreted as prosodic boundaries by PF, at any rate) on the right or left edge of the phase. Consider the derivation of a Tagalog sentence like the one in (104):

- (104) Nakita nila ang lola ni Maria (Tagalog)
 ACC-saw NG.they ANG grandmother NG Maria
 ‘They saw Maria’s grandmother’

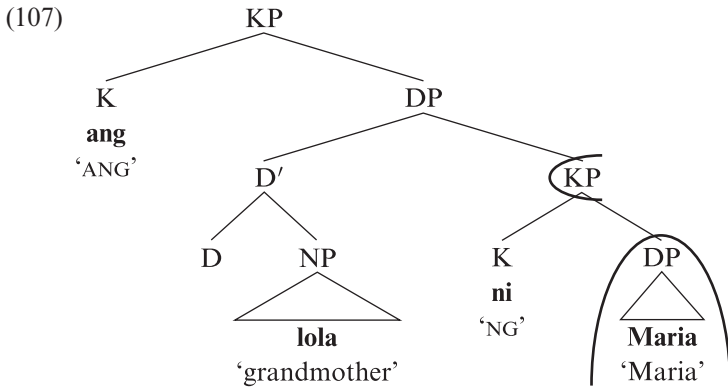
The derivation of (104) might begin by constructing the KP *ni Maria* ‘NG Maria’:



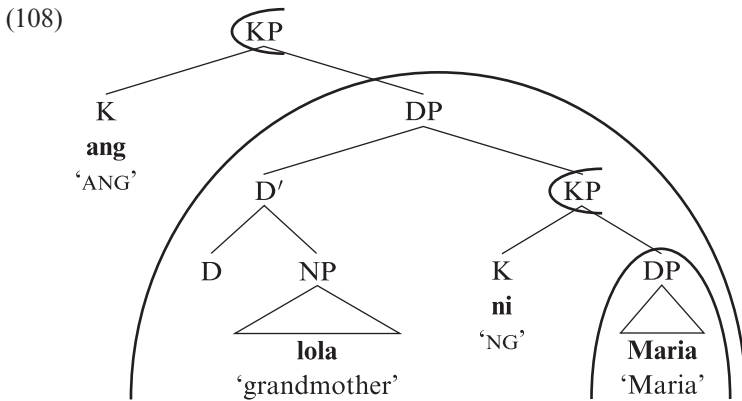
Once this KP is fully constructed, it would undergo Spell-Out, which would have two consequences. Spell-Out would send the DP *Maria* to PF, where it would ultimately be converted into a string of phonemes, and it would also assign a prosodic boundary to the left edge of the KP phase:



The syntactic derivation would continue, Merging the KP in (99) as the possessor of a larger DP:



The previous Spell-Out operation makes the structure linearizable; the DP *Maria* is not linearized in the same phase as the DP *lola* ‘grandmother’, so the Distinctness principle of the previous chapter is respected. Now that the larger KP has been constructed, Spell-Out can apply again:



In the approach to Spell-Out developed here, the edge of the phase is not completely unaffected by Spell-Out; rather, the PF component returns to the syntax an object that has been partly annotated for prosody. The proposal resembles Fox and Pesetsky’s (2004) idea of Cyclic Linearization, in which the syntax manipulates objects which are occasionally annotated for word order.

In the derivation sketched above, the syntax is not simply granted full understanding of the PF representation; rather, certain aspects of the PF representation are determined via Spell-Out before the syntactic derivation has ended. This is probably a desirable result; as I remarked earlier, there are aspects of phonology to which syntax is probably never sensitive, such as syllable structure. As this research program progresses, we may hope to shed further light on the nature and extent of syntax's understanding of phonology.

