Intonation, Adjunction, and Verb-Initial Word Order in Tagalog

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Abstract

Most research on the syntax-phonology interface assumes that prosodic structures are calculated from syntactic structures by a set of mapping principles. It follows from this view that phonological evidence concerning prosodic phrasing should be able to be used to deduce certain aspects of the syntactic structure of a language. In this paper I present a preliminary investigation of intonation in the Austronesian language Tagalog, focussing on pitch rises and pitch falls and their systematic distribution in relatively simple clauses. Given certain assumption concerning the mapping from syntax-to-phonology, I offer an argument based on of the distribution of these pitch contours that verb-initial word order in Tagalog motivates an analysis involving 'subject lowering' over some of the more conventional analyses of verb-initial word order that have been proposed. The specific version of subject lowering that I argue for here is one in which it operates over a syntactic representation, but is also prosodically motivated. If correct, this entails a view of the interaction between syntax and phonology that goes beyond exclusively modular views according to which operations affecting syntactic representations have no access to the (eventual) phonological representation of a sentence. I will argue, instead, that information about the phonological representation of a sentence must, at least in a limited sense, be available prior to the actual construction of the phonological representation.

Key words: Syntax-phonology interface, syntax-to-phonology mapping, intonation, modularity, verb-initial languages, adjunction.

1 Introduction

This paper is broadly concerned with the relationship between syntactic phrasing and phonological phrasing in Tagalog (a Western Austronesian language, native to the Philippines). The main empirical investigation centers around the distribution of pitch rises and pitch falls in relatively simple sentences. The distribution of these pitch contours, we will see in Section 2 and Section 3, is systematic and—for the most part—amenable to a fairly simple description as well as to a straightforward analysis that makes reference to recursive phonological phrasings derived by a simple syntax-to-phonology mapping principle, MATCH PHRASE (Selkirk 2011; Elfner 2012, to appear; Bennett et. al. to appear). While the distribution of pitch contours is more or less categorical for the most part, a difficult analytical challenge is raised by clauses containing three post-verbal arguments. In such clauses, the argument that surfaces in a clause medial position appears to be optionally associated with a pitch rise aligned at its left edge.

Although an apparently minor fact, I will argue that this optional pitch rise provides important evidence for two key claims concerning clause structure in Tagalog. Specifically, I argue in Section 5 on the basis of this optional pitch rise that subjects as well as indirect objects are syntactically adjuncts (specifically, VP-adjuncts). The claim that subject are syntactically adjoined in Tagalog is pre-figured by the subject-lowering analysis argued for in Sabbagh (2005, 2014) to account for verb initial word order and other word order permutations that are attested in Tagalog. Once certain assumptions about the correspondence between syntax and phonology are made (in Section 3.1 and Section 4), we will argue that an alternative, more conventional, analysis of verb initial word order and word order permutation in Tagalog is unable to lend itself as the basis for an account of the optional pitch rises. Overall, then, this work aims to bring prosodic evidence (via an examination of intonation) into a long-standing debate concerning clause structure and the derivation of verb initial word order in Tagalog, which has broader implications for the study of verb-initial languages more generally (for a review of the issues, see Clements & Polinsky to appear; and the collection of works in Carnie & Guilfoyle 2000; and Carnie, Harley, & Dooley 2005).

The argument for subject lowering, if valid, will be argued in Section 5 to have important additional consequences for theoretical views concerning the interaction of syntax and phonology more broadly. In particular, this work follows Sabbagh (2014) in claiming that subject lowering is prosodically motivated. At the same time, I will present an

argument here that subject lowering also applies to a syntactic representation rather than a prosodic one, and that the prosodic motivation for subject lowering is actually obscured, in some cases, by the final prosodic representation. All of this is inconsistent with the claim (Pullum & Zwicky 1988) that operations that affect syntactic representations have no access to phonological information. It is, however, compatible with the view argued for by Richards (2014) in recent work (see also Richards 2010) according to which syntactic operations have limited access to phonological representations in so far as they operate (at least in some cases) to build "a kind of 'rough draft' of the final phonological representation, which can differ from the final phonological representation." (Richards 2014: 2).

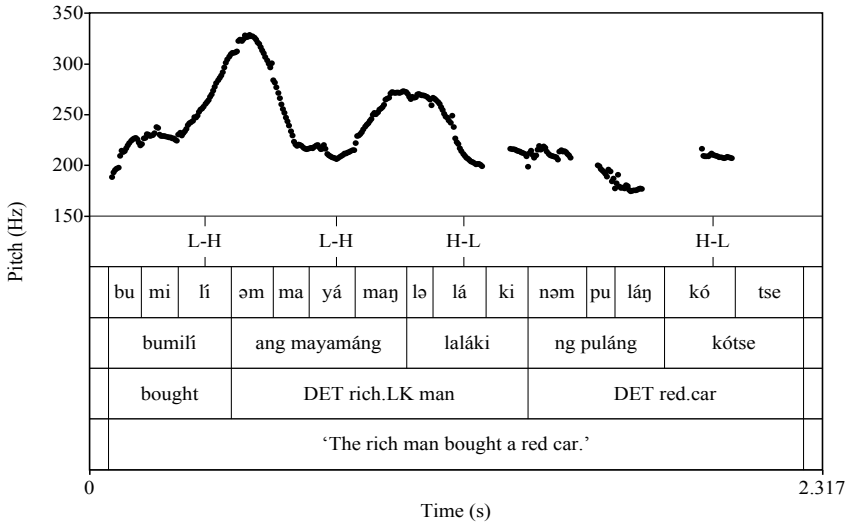
2 The Basic Patterns

Tagalog is a head-initial, predicate-initial language. In the post-predicate domain (i.e. following the verb), arguments may typically occur in any order.[1] The intonation of neutral declarative sentences can generally be described in terms of a series of pitch rises and pitch falls distributed throughout the sentence and typically aligned with stress syllables. Consider, for instance, sentence (1) with VSO word order. The intonational contours for this sentence are illustrated by the pitch track in (2).

(1) B*um*ili ang mayamang lalaki ng pulang kotse.
bought S rich.LK man NS red.LK car
'The rich man bought a red car.'

[1] All arguments are preceded by a case marker that indicates its grammatical function. The abbreviations used in the glosses are as follows: S = subject, NS = non-subject/non-oblique, OBL = oblique. Modification of a noun by an adjective is morphosyntactically 'flagged' by the presence of a LK (=linker).

(2) PITCH TRACK FOR (2)



Observe that there is a clear rise in pitch (=F_0) associated with the stressed syllable of the sentence initial verb, which reaches its peak by the end of this syllable. A similar rise in pitch occurs on the stressed syllable of the pre-nominal adjective (*mayamang* 'rich') which modifies the immediately post-verbal subject. In what follows, I will analyze these pitch rises as instances of a LOW-HIGH (L-H) phrase accent. Note that not all stressed syllables are associated with a L-H phrase accent. In particular, there is no discernible pitch rise on the pre-nominal adjective of the clause final object. Note furthermore that the stressed syllable of the head noun of the immediately post-verbal subject (*lalaki* 'man') appears to be associated with a fall rather than a rise in pitch—i.e. a fall in F_0 that reaches a low point roughly by the end of the syllable. A similar pitch fall appears on the stressed syllable of the head noun (*kotse* 'car') of the clause final direct object. I will analyze these pitch falls throughout as instances of a HIGH-LOW (H-L) phrase accent.[2]

While the full inventory of pitch contours in Tagalog remains a matter for further study, the L-H and H-L contours described above appear consistently and with a fairly systematic distribution. This study will therefore be confined to a discussion of these two phrase accent types, with particular attention being paid to the distribution of the L-H phrase accent. The data for this study is based on recordings from two native speakers of Tagalog (both female), from whom I recorded approximately 325 sentence utterance total. The majority

[2]The pitch fall associated with the clause final object is decidedly less pronounced than the pitch fall associated with the subject, a fact that I attribute to a drop off in voice at the periphery of the sentence.

of sentences used as stimulus for the recordings involved a sentence initial verb followed by three arguments (subject, object, and indirect object) in varied word orders. Two types of clauses were also examined: active clauses (also know as 'Actor-topic' clauses) and passive clauses (also known as 'Theme-topic' clauses). The orders investigated for active clauses are listed in (3), while those for passive clauses are listed in (4).[3]

(3) a. V S O IO
b. V O S IO
c. V O IO S

(4) a. V AG O IO
b. V AG IO O

Other word order permutations are possible for both active and passive clauses, but were not investigated because they were viewed by the native speaker consultants as somewhat unnatural without special context.

Recordings of the Tagalog sentence were analyzed for pitch using Praat (Boersema & Weenink 2007). From the analysis of these pitch tracks, three key generalizations emerged concerning the distribution of pitch rises (L-H phrases accents). These are summarized in (5).[4]

(5) DISTRIBUTION OF L-H PHRASE ACCENTS
a. Immediately post-verbal XP's show a rise on their first content word.
b. Clause final XP's typically show no rise on their first content word.
c. Clause medial XP's show apparent optionality with respect to presence versus absence of a rise on their first content word.

In addition to these major patterns, which will be the main focus of this paper, there are two additional patterns to note. First, there is always an intonation rise aligned with the stressed syllable of the verb in sentence initial position. Second, pitch falls (H-L phrase accents) appear to be aligned with the stressed syllable of the content word that occurs at the right edge of every phrase regardless of the phrase's position in the sentence.

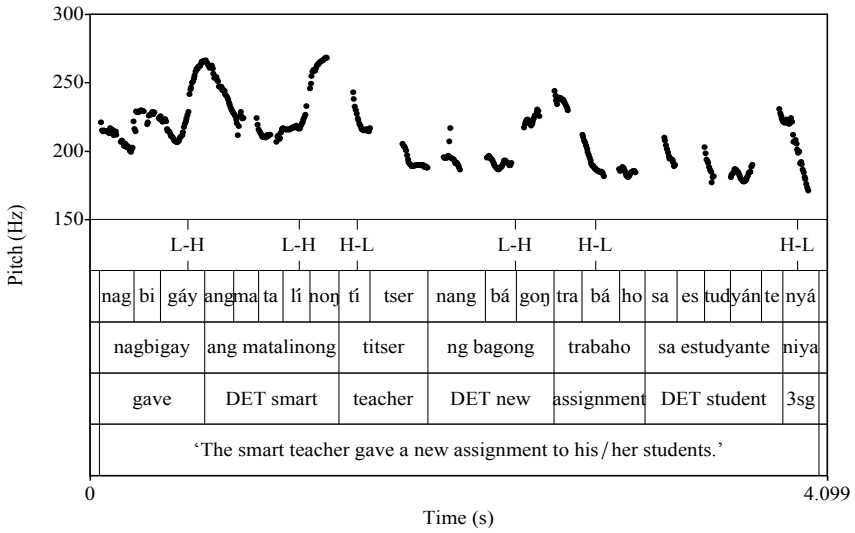
[3]For reasons of space, the discussion below will only concentrate on active clauses. The main generalizations discussed concerning intonation are consistent across both active and passive clauses.

[4]The patterns described here generally match up with those described in Richards (this volume).

The patterns described as (5a-b) are illustrated by the pitch track in (2) for sentence (1) as well as by all subsequent examples to be discussed. The pattern expressed as (5c) can be observed by comparing the pitch track in (7) for sentences (6) and the pitch track in (9) for sentence (8). Observe that both sentences consist of three post-verbal arguments in the order VSOIO. In the pitch track for (6), there is a clear pitch rise aligned to the left edge of the clause medial direct object. In the pitch track for (8), by contrast, no pitch rise appears to be associated with the clause medial direct object. Instead, the pitch seems relatively even throughout the object until it falls at the end of the object.

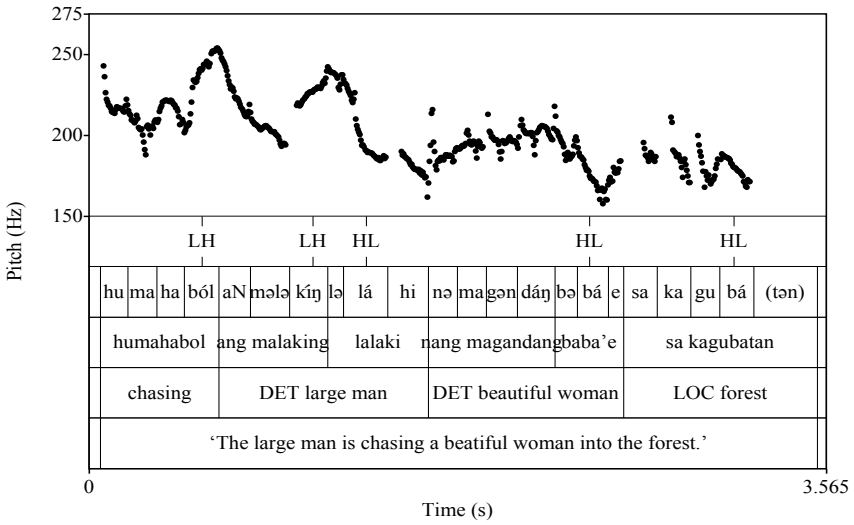
(6) Nagbigay ang matalinong titser ng bagong trabaho sa estudyante
gave S smart.LK teacher NS new.LK assignment OBL student
niya.
3SG(GEN)
'The smart teacher gave a a new assignment to his/her students.'

(7) PITCH TRACK FOR (6)



(8) H*um*ahabol ang malaking lalaki ng magandang babae sa kagubatan.
chased S large.LK man NS beautiful.LK woman LOC forest
'The large man is chasing a beautiful woman into the forest.'

(9) PITCH TRACK FOR (8)



The tables below provide a numeric summary of an examination of the the presence or absence of a L-H phrase accent associated with a particular argument relative to its linear position in the sentence.[5]

Table 1: Distribution of Rise on Subject

Rise	Immed. post-verbal (VSOPP)	Medial (VOSPP)	Final (VOPPS)
Yes	35	19	2
No	6	19	32
Total	41	38	34

[5]Not all examples from the corpus of elicited recordings are included in this summary. Examples that were excluded were excluded due to excessive 'noise' in the pitch tracks.

Table 2: Distribution of Rise on Object

Rise	Immed. post-verbal (VO{S,PP})	Medial (VSOPP)	Final (V{S,PP}O)
Yes	54	19	–
No	14	21	–
Total	68	41	–

Table 3: Distribution of Rise on Indirect Object

Rise	Immed. post-verbal (VPP{O,S})	Medial (VOPPS)	Final (V{S,O}PP)
Yes	–	10	9
No	–	8	34
Total	–	18	43

While these tables plainly indicate that there are a few exceptions to the generalizations stated in (5), they also make clear that the generalizations represent a statistically significant pattern (i.e. one not due to chance). The most interesting pattern here concerns the apparently optional L-H phrase accent associated with clause medial phrases. As we will see, this pattern proves to be the most challenging to account for and much of this article will therefore be devoted to developing an analysis of it. In Section 5, I will argue that this pattern actually provides important evidence that will allow us to adjudicate among different approaches to the post-verbal positioning of the subject (i.e. to verb initial word order generally as well as well to how the attested surface positions of the subjects are derived).

3 The Distribution of Phrase Accents

3.1 Theoretical Preliminaries

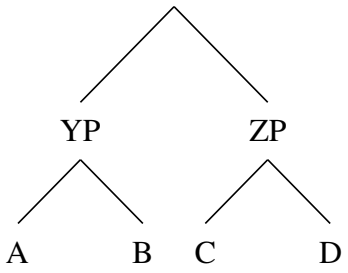
Following a long tradition in studies of the syntax-phonology interface, I assume in what follows that the rules responsible for distributing phrase accents operate on prosodic domains defined with respect to a prosodic structure—namely, a structures that is made up of the (prosodic) categories of syllable (σ), the prosodic word (ω), and the phonological phrase (ϕ). Focussing primarily on the category of the ϕ, I will additionally assume, following the same long tradition, that the prosodic category ϕ is related to syntactic phrasing by means of a mapping principle that 'matches' the category XP (a syntactic phrase) to that of ϕ (a phonological phrase). The specific mapping principle that I will assume here is

given in (10) (from Bennett et. al. to appear, see also Elfner 2012, to appear, and Selkirk 2011).

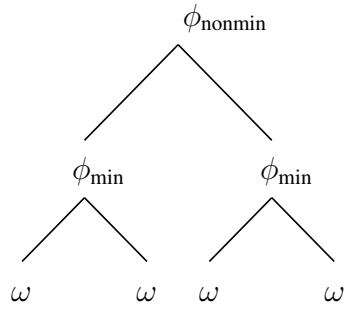
(10) SYNTAX-PROSODY MAPPING PRINCIPLE (MATCH PHRASE)
Given a maximal projection XP in the syntactic representation *S*, where XP dominates all and only the terminal elements $\{a, b, c, ...n\}$, there must be in the phonological representation *P* corresponding to *S* a ϕ-phrase which includes all and only the phonological exponents of *a, b, c, ...n*.

In the absence of interacting constraints (see Section 5.2), the mapping principle in (10) will produce from a syntactic structure like (11) the prosodic structure seen shown in (12).

(11)



(12)



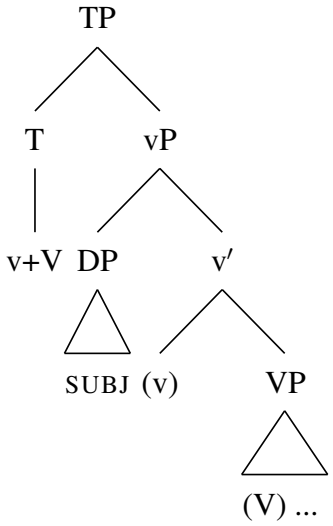
Note that (10) yields prosodic structures that are recursive. The prosodic structure in (12), for instance, contains an instance of the category ϕ embedded within another ϕ. The mapping principle in (10) therefore produces prosodic structures that directly violate the STRICT LAYERING requirement of prosodic structure that characterized much earlier work on the syntax-phonology interface (Nespor & Vogel 1986; Selkirk 1986; Pierrehumbert & Beckman 1988), which required every prosodic category to dominate a subordinate prosodic category (e.g. a ϕ ought to dominate a ω, which in turn should dominate a Foot, which in turn should dominate a σ). The strict layering requirement has largely been abandoned in more recent work (see, e.g., Ladd 1986, 1988; Kubozono 1989, 1992; Féry & Truckenbrodt 2005; Wagner 2005, 2010; Selkirk 2011; Ito & Mester 2007, 2012, 2013; Elfner 2012, to appear). In its place, however, it has proved useful (as it will here) to distinguish the ϕ categories in a recursive prosodic structure like (12) in terms of their relative dominance relations. Concretely, three subcategories of the category ϕ (ϕ-max, ϕ-nonmin, and ϕ-min) can be distinguished as follows:

(13) NATURAL CLASSES OF RECURSIVE ϕ DOMAINS
Maximal ϕ (ϕ_{max}): ϕ not dominated by ϕ
Non-minimal ϕ (ϕ_{nonmin}): ϕ that dominates ϕ
Minimal ϕ (ϕ_{min}): ϕ not dominating ϕ
(Ito & Mester 2012, 2013, Elfner 2012, to appear)

3.2 Distributing L-H and H-L Phrase Accents

While there are many debated issues surrounding Tagalog clause structure (to be discussed in Section 5), there is fairly broad consensus that in terms of the overall hierarchy of the clause, the verb is structurally higher than all of its arguments (Kroeger 1993; Richards 2000; Rackowski 2002; Aldridge 2004; Sabbagh 2013). Provisionally, I will represent this consensus view in terms of a structure like (14) corresponding to a sentence with VSO(IO) word order. This structure assumes that there is a V which heads a VP, which is contained within a vP whose specifier position contains the subject. This vP, in turn, is the complement to an inflectional head (T) which defines the extended projection of the VP. In this representation, V is assumed to have undergone successive head-movement to v then to T.[6]

(14)



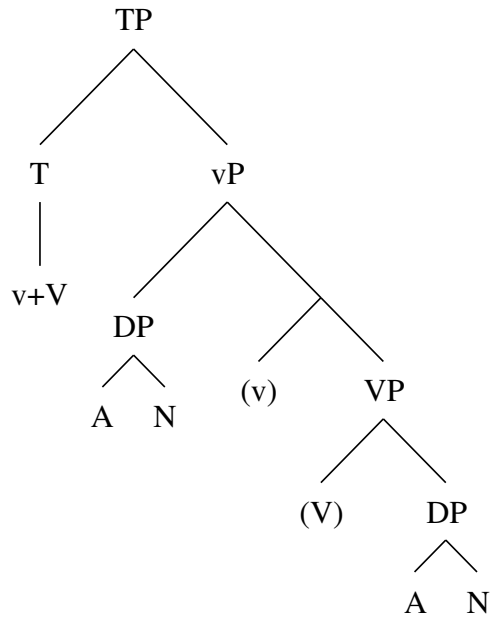
Note that according to (14), the immediately post-verbal position of the subject is represented as being a consequence of the subject occupying in Spec, vP (its presumed thematic position) which is lower than and to the right of the surface position of the verb. As already

[6]Evidence that the verb moves out of the vP comes from the existence of 'Verb-stranding VP-ellipsis'. See Richards (2003) and Section 4 of this paper for discussion.

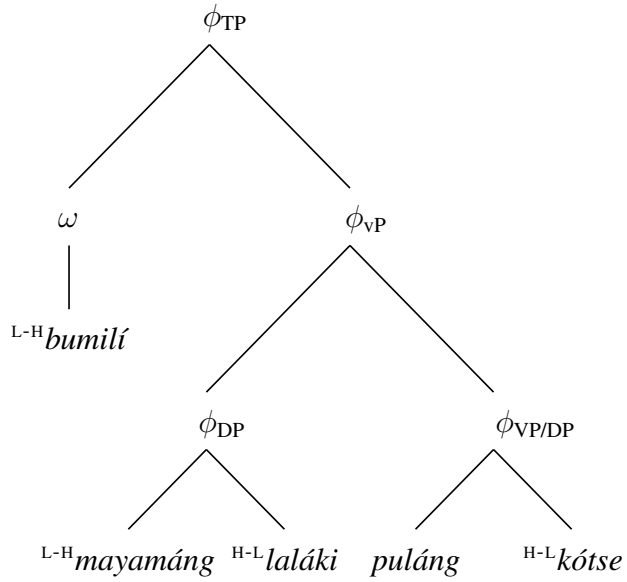
noted, the subject may occur in other post-verbal positions as well. I will return to these other word orders in Section 5. Focusing for now just on VSO(IO) word order and assuming the structure in (14), we can begin to provide a preliminary analysis of the distribution of phrase accents in Tagalog.

Consider again sentence (1), which, based on the model of (14), would have the more elaborated structure in (15). The prosodic structure associated with this syntactic structure given MATCH PHRASE is shown in (16), which additionally shows the distribution of phrase accents observed for sentence (1).

(15)

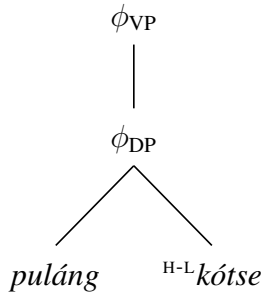


(16)



Note that the syntactic and prosodic structure are nearly but not completely isomorphic. There are two reasons for this. First, it is assumed here that determiners, and function words in general as well as all null terminal nodes (e.g. traces) do not have the status of prosodic words comparable to that of overtly expressed verbs, nouns, and adjectives. Hence, functional words as well as traces will simply be omitted from the prosodic structure (as well as, in general, from the syntactic structure) as they do not seem to play a significant role in the overall phonological phrasing. Second, given MATCH PHRASE the prosodic structure corresponding to the syntactic constituent VP in (15) would be expected to be as in (17), where both the VP and the DP it dominates correspond to independent ϕ's.

(17)



In the structure in (16), however, the ϕ corresponding to the VP and the DP it dominates are collapsed into a single ϕ. Following Elfner (2012, to appear) and Bennet et. al. (to appear), I assume that this 'collapsed' ϕ is preferred over the non-collapsed representation in (17) on the basis of a general principle that requires prosodic constituents to be binary

branching.

(18) BINARITY
Optimal prosodic constituents are binary branching.

The prosodic representation in (17) clearly violates this principle, as the ϕ_{VP} is non-branching.

Given the prosodic structure in (16) for sentence (1), then, the distribution of phrase accents for this and sentences like it can now be accounted for with the following two rules:

(19) a. Distribution of LOW-HIGH (L-H): Assign an L-H phrase accent to the left edge of a *non-minimal* ϕ.
b. Distribution of HIGH-LOW (H-L): Assign an H-L phrase accent to the right edge of ϕ.

Given (19a), an L-H phrase accent is assigned only to the left-edge of ϕ_{TP} and ϕ_{vP} in (16), and this phrase accent is associated with the first (content) word that is aligned to the left-edge of these ϕ's. Note, crucially, that no L-H phrase accent is assigned by (19a) to the left edge of the prosodic constituent in (16) labeled $\phi_{VP/DP}$. This is because, crucially, $\phi_{VP/DP}$ is a minimal ϕ by the definitions given in (13).

Overall, then, (19a) (combined with the current syntactic assumptions and the mapping principle, MATCH PHRASE) provides a relatively simple account for the following generalizations (as exemplified by sentence (1)) concerning the distribution of L-H phrase accents: (i) The clause initial verb is always associated with a pitch rise (=L-H phrase accent); (ii) the immediately post-verbal phrase is always associated with a pitch rise on the the first content word contain within it (=Generalization (5a)); and (iii) a clause final phrases is never associated with a L-H phrase accent on their first content word (=Generalization (5b)). The presence of a H-L phrase accent on the final content word of the subject and object in sentence (1) is accounted for by rule (19b), which assigns a H-L phrase accent to the right edge of ϕ_{DP} and $\phi_{VP/DP}$. Note that this rule, in contrast to the rule that assigns the L-H phrase accent, applies to all ϕ's regardless of whether they are minimal or non-minimal ϕ's. In the next two section, we turn our attention to sentences consisting of three post-verbal arguments and Generalization (5c).

4 ‘Optional’ L-H Phrase Accents

The analysis of the distribution of phrase accents in Tagalog thus far is is identical to the analysis proposed in Elfner (2012, to appear) to account for the distribution of L-H and H-L phrase accents in Connemara Irish. At this point, in fact, virtually every detail of the analysis of the distribution of phrase accents in the Tagalog sentence in (1) parallels Elfner’s analysis of the distribution of phrase accents for the Irish VSO sentence in (20). Note that the distribution of phrase accents here (as shown in the annotated form in (20b)) is identical to the Tagalog sentence in (1).

(20) a. Díolfaidh rúnaí dathúil blathanna áille.
see.fut secretary handsome flowers beautiful
‘The handsome secretary will sell beautiful flowers.’ (Elfner 2013:5)

b. [$_{V}$ $^{\mathbf{L-H}}$díolfaidh] [$_{S}$ $^{\mathbf{L-H}}$rúnaí $^{\mathbf{H-L}}$dathúil] [$_{O}$ blathanna $^{\mathbf{H-L}}$áille]
sell.fut secretary handsome flowers beautiful.pl

On the approach being taken here, the parallels between Tagalog and Irish emerge from the assumption that the intonational contours observed in both languages can be described in the same terms of a L-H and H-L phrase accent distributed according to the rules in (19). Significantly also, the parallels follow on the crucial assumption that the clause structure of Tagalog and Irish is organized in much the same fashion—namely, along the lines represented by (15).[7]

While the distribution of phrase accents in Tagalog is, surprisingly, nearly identical to Irish, there is at least one subtle difference between the two languages. In Irish ditransitive configurations (of the form VSOIO) like (21), there is an obligatory L-H phrase accent aligned to the left edge of the direct object.

(21) a. díolfaidh rúnaí dathúil blathanna áille le daoine anamúla.
sell.fut secretary handsome flowers beautiful.pl with people animated.pl
‘A handsome secretary will sell beautiful flowers to animated people.’ (Elfner 2013:15)

[7]For Irish, the clause structure in (15) has been amply argued for in several works by McCloskey (1991, 1996a, 1996b, 2011). There have been a number of modifications to this picture concerning the exact locations of the verb and subject, but the overall approach has not changed much and the exact details do not bear on the present discussion.

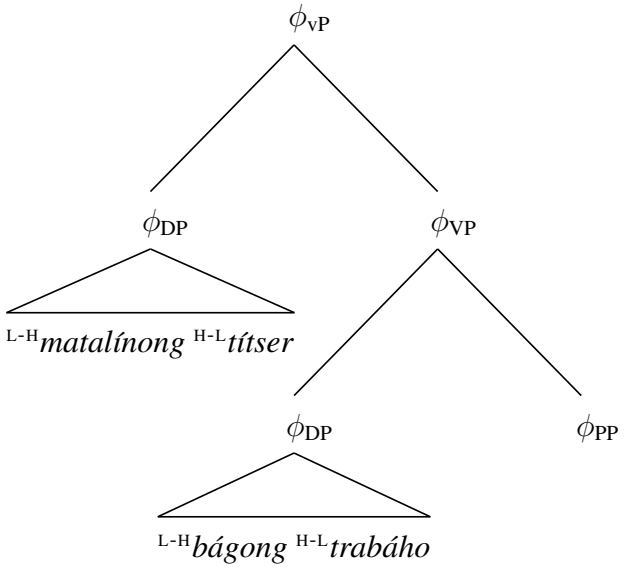
b. [$_{V}$ $^{\mathbf{L-H}}$díolfaidh] [$_{S}$ $^{\mathbf{L-H}}$rúnaí $^{\mathbf{H-L}}$dathúil] [$_{O}$ $\boxed{^{\mathbf{L-H}}\text{blathanna}}$ $^{\mathbf{H-L}}$áille] [$_{IO}$ le daoine $^{\mathbf{H-L}}$anamúla].

sell.fut secretary handsome flowers beautiful.pl with people animated.pl

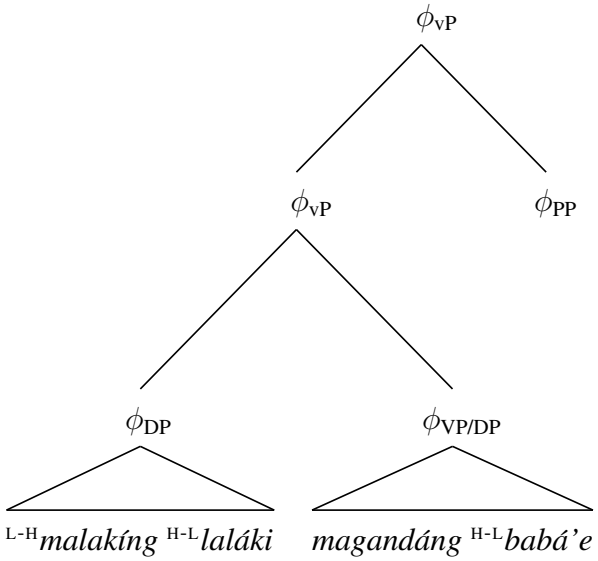
In Tagalog, by contrast, a L-H phrase accent may but apparently need not be aligned with the left edge of the direct object in corresponding VSOIO sentences. The clause medial object in example (6), for instance, surfaces with a L-H phrase accent but no discernible L-H phrase accent appears to be associated with the clause medial object in the nearly parallel example in (8).

If the approach we are taking here is to provide us with a principled account of the distribution of phrase accents, then the presence versus absence of a L-H phrase accent for clause medial objects should flow from the prosodic phrasing. More specifically, the prosodic structure in (22) (representing the ϕ corresponding to the vP) is the one we expect for the VSOIO sentence in (6) where the direct object is associated with a L-H phrase accent. On the other hand, the prosodic structure in (23) is the one we should expect for the VSOIO sentence in (8) where the direct object is not associated with a L-H phrase accent. (The specific choice of labels indicating the syntactic category that each ϕ corresponds to will be made clear shortly.)

(22)

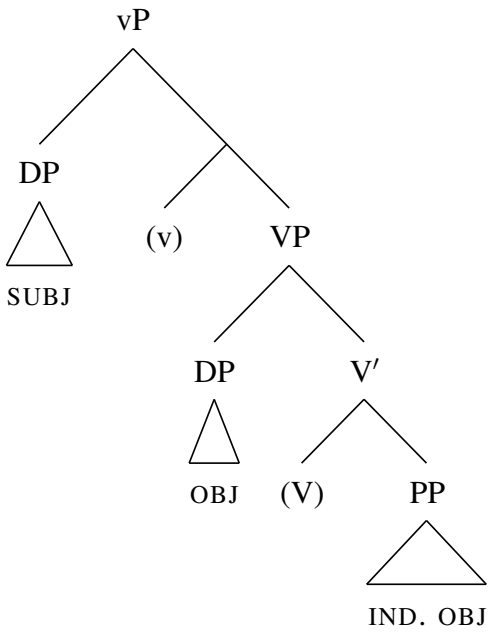


(23)



Given the framework we are adopting here, phonological phrasings ideally should be determined straightforwardly by a mapping from the syntax to the phonology. The question we might ask, then, is this: What are the syntactic structures that provide the basis for a mapping to the prosodic structures in (22) and (23)? Consider first the prosodic phrasing in (22). This phrasing is exactly the one we would expect given a descending VP-structure of the sort envisaged by Larson (1988, 1990) among many others, shown in (24), whereby the indirect object (as well as adverbials, if present) are merged as inner-complements of the verb.

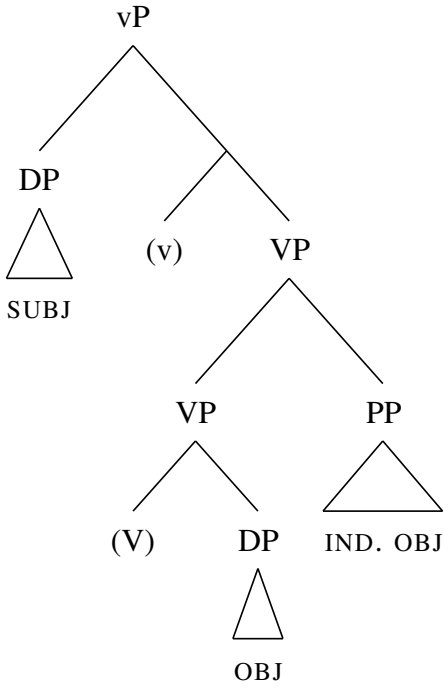
(24)



Give this syntactic structure, the prosodic structure in (22) corresponds pretty much isomorphically assuming the correspondences between the ϕ's and syntactic categories indicated. The phonological phrasing in (23), on the other hand, is not consistent with MATCH PHRASE given this structure since there is no ϕ in this prosodic structure that corresponds to the VP and which includes all and only the phonological material corresponding to the categories dominated by the VP.

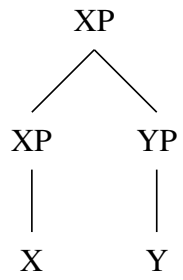
On the other hand, the prosodic structure in (23) is what we would expect as the mapping from an *ascending* VP structure such as (25) where the indirect object is right-adjoined to the VP.

(25)



In order to understand exactly why this structure would lead to the prosodic phrasing in (23), we must first introduce certain assumptions about adjunction structures. Concretely, it is quite standardly assumed that for structures involving adjunction of the type schematized in (26), each XP is not a distinct category XP but a *segment* of a single category, XP (May 1985; Chomsky 1986, 1995).

(26)



Given the definition of dominance in (27), it follows from this segment theory of adjunction that XP in (26) dominates only X, but not YP/Y since YP is not dominated by every segment of XP.[8]

(27) DOMINANCE

[8]See May (1985); Chomsky (1986; 1995:Ch. 4); Kracht (1998); Chametzky (2003); Hornstein & Nunes (2008), among others.

X *dominates* Y if and only if Y is contained within all segments of X.

Given (24), the VP in (25) dominates only the direct but not the indirect object, since the latter is not dominated by every segment of VP. This, in turn, has important consequences for the prosodic structure that will be formed from the syntactic structure given the mapping principle MATCH PHRASE which makes crucial reference to dominance relations established in the syntax. Concretely, since the indirect object is not dominated by the VP in (25), the ϕ which corresponds to the VP (ϕ_{VP}) should not include the phonological phrase corresponding to the indirect object (ϕ_{IO}). Instead, ϕ_{IO} must minimally be included a the level of the ϕ corresponding to the vP (ϕ_{vP}), the next highest category above VP that dominates the indirect object. Putting all of this together yields the prosodic structure in (27) where ϕ_{IO} is represented as being prosodically adjoined (in the sense of Ito & Mester 2012, 2013) to ϕ_{vP}. Note that in this structure ϕ_{VP}, which is collapsed with ϕ_{O} (the ϕ corresponding to the direct object), is a minimal ϕ. Given this, no L-H phrase accent is associated with the direct object.

Assuming the prosodic phrasings in (22) and (23) as mappings from the syntactic structures in (24) and (25), respectively, the obligatory L-H phrase accents associated with the direct object for the Irish example in (21) follows if (24) is the only available syntactic structure to represent ditransitive (VSOIO) configurations in Irish. For Tagalog, where the L-H phrase accent optionally associates with the object in similar configurations, a tantalizing possibility to consider is that the syntactic representations in (24) and (25) are both available in the grammar. Under this approach, then, the prosodic phrasing needed to describe the distribution of phrase accents for sentence (6) (i.e. the phrasing in (22)) would be mapped from the structure in (24). The prosodic phrasing needed to describe the distribution of phrase accents for sentence (8) (i.e. the phrasing in (23)), on the other hand, would be mapped from the structure in (25).

How plausible is this 'dual VP' analysis from a syntactic perspective? As it happens, the possibility of co-existing ascending and descending syntactic structures for VP for ditransitive constructions is prefigured by Pesetsky (1995) to account for certain phrase structure paradoxes in English (see also Phillips 1996, 2003; Lechner 2003; Landau 2007; and Janke & Neeleman 2012). Pesetsky observes, for instance, that the English VP-fronting construction in (28) requires an analysis that makes references to both an ascending and descending VP-structure. The ascending structure is necessary to account for the fact that the verb,

object, and indirect object act as a constituent excluding the temporal adverb for purposes of VP-fronting. On the other hand, a descending VP-structure, in which the indirect object c-command the temporal adverb, is necessary in order to account for the binding (by the indirect object) of the reciprocal contained within the temporal adverb.

(28) John intended to give the book to the children, and
[$_{VP}$ give the book to them$_i$] he did *on each other$_i$'s birthdays*.

Similar types of evidence from Tagalog seem to support a dual-VP analysis. For instance, support for an ascending VP-structure comes from a process of VP-ellipsis. In Tagalog, VP-ellipsis constructions take the form a 'V-stranding VP-ellipsis' (Goldberg 2005) in which the verb's arguments are omitted but a verb remains behind. Consider (29). The elided material is represented as [$_{VP}$ Δ].[9]

(29) Nagbigay si Juan ng regalo sa mga estudyante, at nagbigay naman si Maria
gave S Juan NS gift OBL PL student and gave also S Maria
[$_{VP}$ Δ].

'Juan gave a gift to the students, and Maria did too.'

The fact that the verb remains behind in constructions involving VP-ellipsis follows from the assumption (see Section 3.2) that the verb raises out of the VP and hence 'survives' ellipsis. Thus, a fuller representation of the ellipsis process in (29) would be as given in (30).

(30) ...at [$_{TP}$ nagbigay$_i$ si Maria [$_{VP}$ t_i ~~ng~~ ~~regalo~~ ~~sa~~ ~~mga~~ ~~estudyante~~]]
and gave S Juan NS gift OBL PL student

Note now that VP-ellipsis may result in omission of the direct object alone, with the indirect object remaining overt.

(31) Nagbigay si Juan ng regalo sa mga estudyante, at nagbigay si Maria [$_{VP}$ Δ]
gave S Juan NS regalo OBL PL student and gave S Maria
sa kanyang ina.
OBL 3SG(OBL) mother
'Juan gave a gift to the students, and Maria did to her mother.'

[9]See Richards (2003) for evidence that constructions like (29) do indeed involve VP-ellipsis rather than some type of *pro*-drop.

Example (31) thus suggests that there is a VP-constituent that contains the direct object but excludes the indirect object. Accordingly, the fuller representation showing the ellipsis process in (31) would be as given in (32).

(32) ...at [$_{TP}$ nagbigay$_i$ si Maria [$_{VP}$ [$_{VP}$ t_i ~~ng~~ ~~regalo~~] sa kanyang ina]]
and gave S Maria NS gift OBL 3SG(OBL) mother

Crucially, VP-ellipsis where the indirect object survives ellipsis is only predicted to be possible given the possibility of an ascending VP structure like (25). On the other hand, examples like (33) appear shows that an indirect object can c-command a (right peripheral) temporal adverb, which therefore also supports the availability of a descending VP-structure.

(33) Nagbigay ang titser ng regalo sa bawa't estudyante$_i$ sa kanyang$_i$
gave S teacher NS gift OBL every student OBL 3SG(OBL)
kaarawan.
birthday
'The teacher gave a gift to every student$_i$ on his/her$_i$ birthday.'

Overall, then, the 'dual VP' analysis seems to be justified for Tagalog from a syntactic perspective.

Positing co-existing descending and ascending VP's only takes us so far, however, in our account of the distribution of the L-H phrase accent. This is because the 'optionality' of the L-H phrase accent associated with the direct object in VSOIO sentences is part of a broader generalization: In sentences containing three post-verbal arguments, a L-H phrase accent is optionally associated with *whatever phrase* surfaces in clause medial position. In example (34) which exhibits VOSIO word order, for instance, the clause medial subject surfaces with a L-H phrase accent aligned at its left edge, while in example (35) the clause medial subject surfaces without a L-H phrase accent. (Pitch tracks for all subsequent examples can be found in the Appendix.)

(34) a. Nagbigay ng murang kotse *ang mayamang baba'e* sa mahinang lalaki.
gave NS cheap.LK car S rich.LK woman DAT weak.LK man
'The rich woman gave a cheap car to the weak man.'

b. [$_V$ $^{\mathbf{L-H}}$nagbigáy] [$_O$ ng $^{\mathbf{L-H}}$múrang $^{\mathbf{H-L}}$kótse] [$_S$ ang $\boxed{^{\mathbf{L-H}}\text{mayámang}}$
PERF.give NS cheap.LK car S rich.LK
$^{\mathbf{H-L}}$babáe] [$_{IO}$ sa mahínang $^{\mathbf{H-L}}$laláki].
woman DAT weak.LK man

(35) a. H*um*ahabol ng magandang baba'e *ang malaking lalaki* sa kagubatan.
chasing NS beautiful.LK woman S large.LK man LOC forest
'The large man is chasing the beautiful woman into the forest.'

b. [$_{V}$ $^{\mathbf{L-H}}$h*um*ahábol] [$_{O}$ ng $^{\mathbf{L-H}}$magandáng $^{\mathbf{H-L}}$babá'e] [$_{S}$ ang
IMPERF.chase NS beautiful.LK woman S
malakíng $^{\mathbf{H-L}}$laláki] [$_{IO}$ sa $^{\mathbf{H-L}}$kagubátan].
large.LK man LOC forest

The examples in (36-37) (two productions of the same sentence) exhibit VOIOS (=clause medial indirect object) word order. In example (36) the indirect object surfaces with a L-H phrase accent aligned at its left edge, while in example (37) the indirect object surfaces without a L-H phrase accent aligned at its left-edge.

(36) a. Nagbigay ng pulang bulaklak *sa matalinong guro* ang batang
gave NS red.LK flower DAT smart.LK teacher S young.LK
baba'e.
woman
'The young woman gave a red flower to the smart teacher.'

b. [$_{V}$ $^{\mathbf{L-H}}$nagbigáy] [$_{O}$ ng $^{\mathbf{L-H}}$púlang $^{\mathbf{H-L}}$buláklak] [$_{IO}$ sa
PERF.give NS red.LK flower DAT
$^{\mathbf{L-H}}$matalínong $^{\mathbf{H-L}}$gúro] [$_{S}$ ang bátang $^{\mathbf{H-L}}$babáe].
smart.LK teacher S young.LK woman

(37) a. Nagbigay ng pulang bulaklak *sa matalinong guro* ang batang babae.
gave NS red.LK flower DAT smart.LK teacher S young.LK girl
'The young girl gave a read flower to the smart teacher.'

b. [$_{V}$ $^{\mathbf{L-H}}$nagbigáy] [$_{O}$ ng $^{\mathbf{L-H}}$púlang $^{\mathbf{H-L}}$buláklak] [$_{IO}$ sa matalínong
PERF.give NS red.LK flower DAT smart.LK
$^{\mathbf{H-L}}$gúro] [$_{S}$ ang bátang $^{\mathbf{H-L}}$babáe].
teacher S young.LK girl

Positing (24) and (25) as co-existing VP structures, while possibility motivated for syntactic reasons and therefore independently necessary, cannot provide a full explanation for why this broader generalization holds for sentences with these other word orders in addition to sentences like (6) and (8) with VSOIO word order.

Of course, an explanation for this broader generalization can't be reached without an analysis of how the various surface positions of the subject are derived in the first place. Here we potentially get into murky territory, as the Tagalog syntax literature offers at least two opposing approaches to the attested word order options in the language. That said,

I argue in the next section that the broader generalization concerning L-H phrase accents and clause medial phrases in fact provides a crucial missing argument that allows us to adjudicate among these contrasting approaches. Although a 'dual VP' analysis will not play a crucial role in the discussion to follow, I will nonetheless assume that (24) and (25) are both available in the grammar of Tagalog. This assumption is validated by the syntactic evidence discussed above, and—as we will see—the availability of the ascending VP-structure in (25) plays an important role in the overall analysis that will offered.[10]

5 Word Order and Subject Lowering

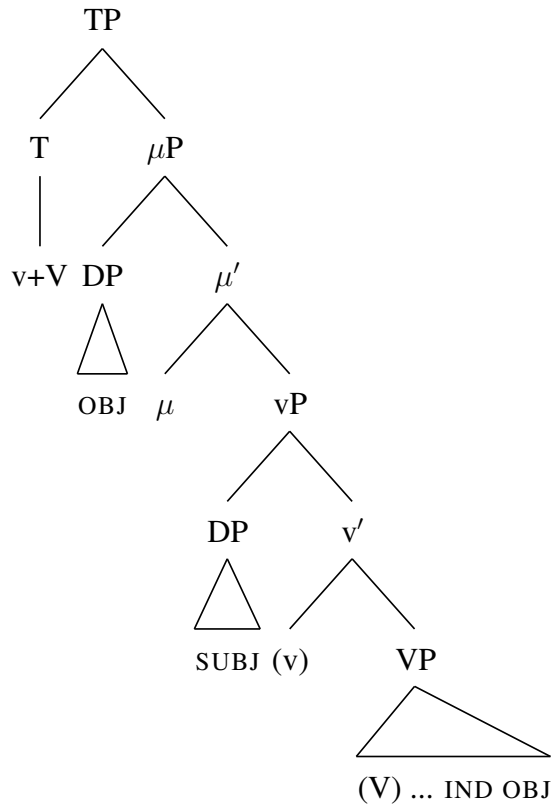
One of the outstanding debates in the Tagalog syntax literature concerns the source of the various word order permutations that are observed in the language, specifically relating to the various surface positions available for the subject. All recent works (to my knowledge) agree on a basic claim embodied in the structure in (15) from above—namely, that in the 'surface structure' the verb is to the left of a constituent that contains the subject and other arguments of the verb. Beyond this, views differ concerning how the various post-verbal positions for the subject are derived.

According to one view, word orders in which the subject is immediately post-verbal (i.e. VSO(IO)) are basic and are derived simply, as suggested in (15), by head-movement of the verb out of the vP and to the left of the subject which resides in its thematic position, Spec, vP (Rackowski 2002; Richards 2003; Aldridge 2004; Rackowski & Richards 2005; among others). Other word orders are then presumed to be derived by movement of non-subject arguments to the left of the subject. Thus, a sentence with VOS(IO) word order might be derived, according to this view, as illustrated in (38) where the object has moved to the specifier of functional projection located above the vP.[11]

[10] I leave open the question of whether both VP-structures literally 'co-exist' within the grammar, or whether the structure in which the indirect object is adjoined to VP might instead be derived from the descending VP-structure.

[11] Alternatively, the non-subject argument might be assumed to move to an 'outer specifier' of the vP, assuming the validity of multiple specifiers (though see Grohmann 2001 for an important dissenting view). This detail does not bear on the argument to be made in the main text.

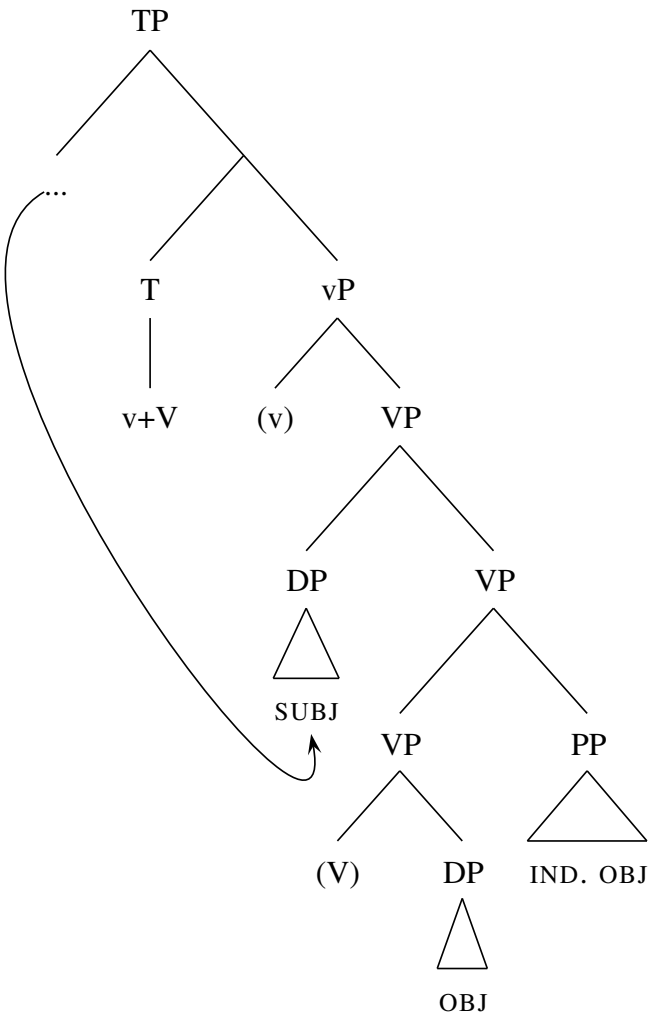
(38)



An alternative, though more controversial, analysis proposes that all surface positions for the subject result from an operation that lowers the subject from a relatively high position in the clause (e.g. Spec, TP) and adjoins it to a segment of the VP. According to this analysis, argued for by Sabbagh (2005, 2014), a sentence with VSOIO word order results when the subject is lowered and adjoined to the left of the segment of the VP that includes the object (and the indirect object), as illustrated in (39).[12]

[12]Choe 1987 and Chung (1990, 1998) were the first to propose that verb initial word order might be derived by subject lowering. The syntactic argument summarized in Section 5.2 for subject lowering in Tagalog is modeled on Chung's argument for subject lowering in Chamorro.

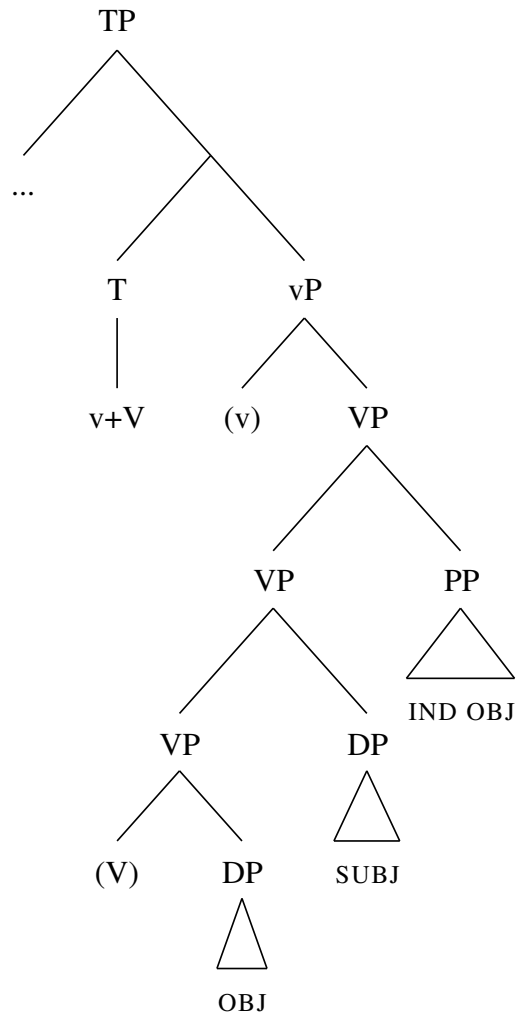
(39)



Assuming the possibility of adjunction of the indirect object made possible by the 'dual VP' analysis discussed in Section 4, a sentence with VOSIO word order can be assumed to result from subject lowering and adjunction of the subject to the right of the segment of the VP containing the direct object but not the indirect object as illustrated in (40).[13]

[13] Additional support for the (possibility of) adjunction comes from restrictions on extraction in Tagalog. In Tagalog and many other 'Philippine type' languages, non-subject arguments—namely, direct objects and agents of passive clauses are unable to relativize or otherwise be extracted. Significantly, indirect objects pattern with uncontroversial adjuncts in being eligible for extraction. From this perspective, then, indirect objects and (uncontroversial) adjuncts form a natural class.

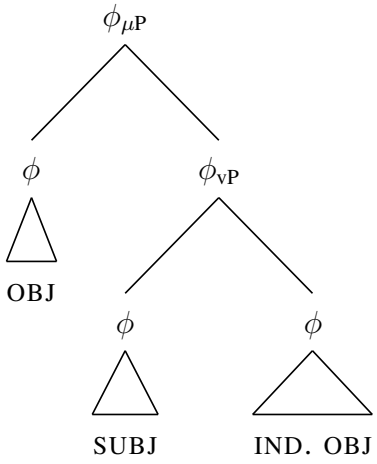
(40)



Putting aside for now what the syntactic argument is for subject lowering (see Section 5.2), I wish to argue now that the distribution of the L-H phrase accent—in particular, Generalization (5c)—offers an argument for this approach.

Crucially, if (38) represents the correct analysis for sentences with word order VOSIO, then we predict only a single prosodic structure corresponding to this syntactic representation that is consistent with MATCH PHRASE. This is the prosodic structure shown in (41) where the ϕ corresponding to the object and to the subject both occur on the left branch of another ϕ ($\phi_{\mu P}$ and ϕ_{vP}, respectively).

(41)



Since (41) is the only prosodic structure we would expect on the basis of (38), we also predict an obligatory L-H phrase accent to be obligatorily aligned to the left edge of the subject.[14] As we have already seen, this prediction is incorrect. While a clause medial subject may surface with a L-H phrase accent aligned at its left edge as in example (34), the subject may also surface with no L-H phrase accent as in example (35).

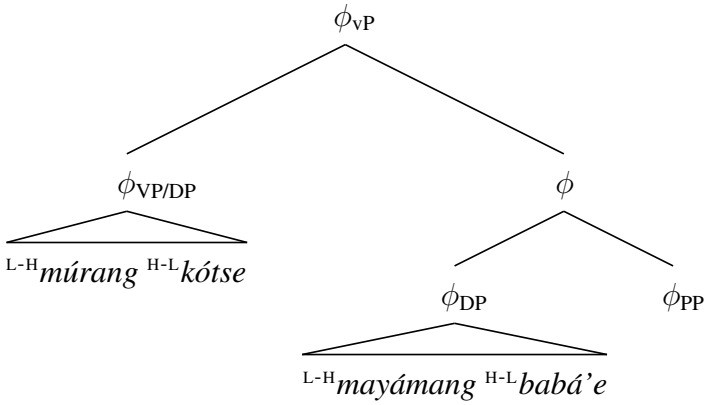
By way of contrast, consider now the analysis of VOSIO word order as envisaged by the subject lowering analysis. According to this analysis, the subject is adjoined to the VP and is therefore not dominated by the VP given (27). Assuming VP-adjunction of the indirect object as well (see Section 4), the indirect object will likewise not be dominated by the VP. Given this and given MATCH PHRASE, the ϕ's corresponding to the subject and the indirect object (ϕ_S and ϕ_{IO}) will not be included in the prosodic structure in the ϕ that corresponds to the VP ϕ_{VP}. Instead, they will be included in the ϕ corresponding to the vP (ϕ_{vP}), the next higher category in the syntactic representation which does dominate the subject and the indirect object.

Continuing to assume that phonological phrases are optimally binary (see Section 3), there are two prosodic structures that would be a valid mapping from (40). These are shown in (42) and (43) representing the prosodic structures for the examples (34) and (35), respectively.[15]

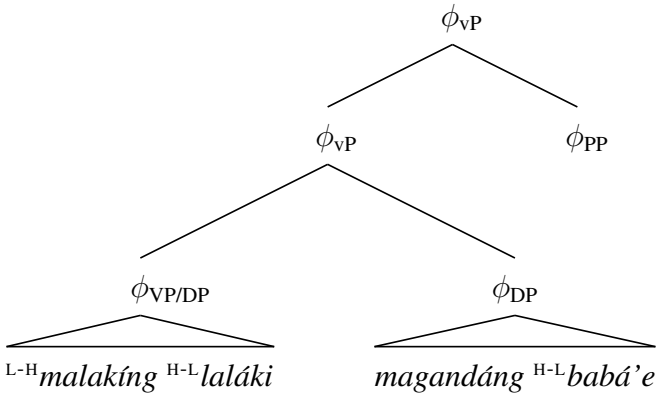
[14] This is true regardless of whether the indirect object is adjoined or not.

[15] See Bennett et. al. (to appear, pp. 34-37) for a related discussion of the phonological phrasing options available in Irish for constructions involving multiple adjuction.

(42)



(43)



In the prosodic structure in (42), ϕ_S and ϕ_{IO} have merged together into a single ϕ which is prosodically adjoined to the ϕ_{vP}.[16] Since ϕ_S occurs on the left branch of this ϕ, this structure is consistent with the presence of a L-H phrase accent aligned to the left edge of the subject.

The prosodic structure in (43) is an equally viable mapping from (40). Here, instead of merging together into a single ϕ, ϕ_S and ϕ_{IO} are prosodically adjoined independently to ϕ_{vP}. The resulting structure is one where ϕ_S occurs on the right branch of ϕ_{vP} and is therefore consistent with the absence of a L-H phrase accent aligned to the left edge of the subject.

To summarize: The subject lowering hypothesis, when coupled with the hypothesis that indirect objects are (or at least can be) adjoined to the VP, is able to generate more than one single prosodic structures for sentences with VOSIO word order. This, in turn, provides an account for the 'optionality' of a L-H phrase accent associated with the subject for sentences with this word order. By contrast, an analysis like (38) yields only a single

[16]Note that MATCH PHRASE is not necessarily violated by a ϕ that does not correspond to an XP in the syntactic representation. This is because MATCH PHRASE, as formulated in (10), requires every XP in the syntax to correspond to a ϕ in the phonological representation, but does not require every ϕ to correspond to an XP.

prosodic structure for sentences with VOSIO and hence predicts only one possibility viz-a-viz the distribution of the L-H phrase accent associated with the clause medial phrase.

While subject lowering is not crucial to an analysis of the distribution of L-H phrase accents in sentences with VSOIO word order (we were able to account for this in Section 4 without subject lowering, given the availability of both a descending and ascending VP-structure), it is also consistent with it. In particular, the prosodic structures in (22) and (23) (as phonological phrasings for (6) and (8), respectively) are equally legitimate mappings from (39), the presumed syntactic representation of a sentence with VSOIO according to the subject lowering hypothesis. In (39) as in (40) the subject and indirect object are both adjoined to VP, and hence not dominated by VP. Given this, ϕ_{S} and ϕ_{IO} will therefore not be included in ϕ_{VP}, but rather will be included in ϕ_{vP} the next highest category in the syntactic representation that dominates both the subject and the indirect. Since the ϕ_{S} and ϕ_{IO} are not adjacent as they are in (40) (i.e. when the order is VOSIO), they cannot merge together into a single ϕ that will be prosodically adjoined to ϕ_{vP}. Instead, ϕ_{S} and ϕ_{IO} must be prosodically adjoined independently to ϕ_{vP}. Supposing that there is no restriction on the ordering by which these ϕ's adjoin to ϕ_{vP}, the prosodic structure in (22) can be viewd as resulting from prosodic adjunction of ϕ_{IO} to ϕ_{vP} followed by adjunction of ϕ_{S}. The prosodic structure in (23), then, would formed by prosodic adjunction of ϕ_{S} to ϕ_{vP} followed by prosodic adjunction of ϕ_{IO}.[17]

Subject lowering is crucial to an account of the distribution of the L-H phrase accent for sentences with VOIOS word order such as (36-37), where, as we have already noted, the clause medial indirect object is optionally associated with a L-H phrase accent. The details of the analysis for these examples are essentially the same as the analysis of the examples in (34) and (35). Concretely, assuming a structure identical to (40) but with the order of subject and indirect object reversed, two mappings from this structure to the prosodic structure are available. For (36), the prosodic structure is as shown in (44) in which ϕ_{IO} and ϕ_{S} have merged together forming a ϕ that is prosodically adjoined to ϕ_{vP} (compare to the analysis of the prosodic structure of (36a)). For (37), the prosodic structure is the one shown in (45) where ϕ_{IO} and ϕ_{S} have been independently prosodically adjoined to ϕ_{vP}.

(44) ($_{\phi}$ $^{\mathbf{L-H}}$*nagbigay* ($_{\phi}$ ($_{\phi}$ $^{\mathbf{L-H}}$*pulang* $^{\mathbf{H-L}}$*bulaklak*)($_{\phi}$ ($_{\phi}$ $^{\mathbf{L-H}}$*matalinong* $^{\mathbf{H-L}}$*guro*) ($_{\phi}$ *batang* $^{\mathbf{H-H}}$*babae*)))

[17] Alternatively, one might stipulate that prosodic adjunction must operate from left to right. If so, the different prosodic structures could be related to the difference between a descending and ascending VP-structure as proposed in Section 4.

(45) ($_{\phi}$ $^{\mathbf{L-H}}$*nagbigay* ($_{\phi}$ ($_{\phi}$ ($_{\phi}$ $^{\mathbf{L-H}}$*pulang* $^{\mathbf{H-L}}$*bulaklak*)($_{\phi}$ *matalinong* $^{\mathbf{H-L}}$*guro*)) ($_{\phi}$ *batang* $^{\mathbf{H-L}}$*babae*)))

Were we to adopt the alternative to subject lowering according to which word orders that do not involve an immediately post-verbal subject are derived by leftward movement, then VOIOS would be the result of moving both the object and the subject to a left-peripheral positions, as schematized in (46).

(46) [$_{\text{TP}}$ v+V [DP_{O} [PP_{IO} [$_{\text{vP}}$ DP_{S} [$_{\text{v}'}$ (v) [$_{\text{VP}}$ ---O ---IO]]]]]]

Problematically, the only prosodic structure that would be a valid mapping from this syntactic representation is the one in (44), which incorrectly predicts that the indirect object should always surface with a L-H phrase accent aligned at its left edge.

5.1 Summary and Further Consequences

We have argued thus far, as follows: Subject lowering, in conjunction with the claim that indirect objects may be realized syntactically as VP-adjuncts, provides the basis for an account of the generalization that in clauses with three post-verbal arguments, the clause medial argument is optionally realized with a L-H phrase accent (=Generalization (5c)). The key ingredient of the analysis is the way that syntactic adjunction interacts with the mapping principle MATCH PHRASE. Concretely, because the subject and indirect object are adjuncts, the ϕ's corresponding to these phrases will not be included in the ϕ corresponding to the category (VP) to which they are adjoined. MATCH PHRASE then imposes only the relatively weak requirement that the ϕ corresponding to the subject and the indirect object be included in some ϕ corresponding to a category in the syntax that dominates both of them (e.g. vP). Inclusion at this level can be satisfied in more than one way, resulting in different phonological phrasings and consequently a different distribution of the L-H phrase accent.

We have further argued that an analysis which employs leftward movement over the subject to derive word orders where the subject is not immediately post-verbal cannot provide an account for the 'optional' L-H phrase accent associated with clause medial phrases. The reason for this can be summarized quite simply: According to the leftward-movement approach, the clause medial phrase (in sentences with three post-verbal arguments) is presumed to be a left-specifier of some (functional) phrase. Given the mapping principle

MATCH PHRASE, the ϕ corresponding to the clause medial phrase will therefore always be included as the left branch of the ϕ corresponding to the phrase whose specifier it occupies, a configuration which leads to the expectation of an obligatory L-H phrase accent associated with the clause medial phrase (given rule (19a)).

If the argument made here is valid, then the evidence from the distribution of phrase accents converges nicely with the syntactic evidence for subject lowering. The syntactic evidence for subject lowering comes from word order in sentences with coordination. Sentences like (47) (from Sabbagh 2014:66) are the crucial examples for this argument. Here, two clause like constituents are coordinated and have a shared subject which surfaces in a intermediate position within the rightmost conjunct.[18]

(47) Hindi [p*um*unta sa tindahan] o [b*um*ili *ang kapatid ko* ng bigas].
not go LOC store or buy S brother 1SG(GEN) NS rice
'My brother didn't go to the store or buy any rice.'

Sabbagh (2014:65-67) argues that examples like (47) cannot be analyzed as in (48), with the subject that surfaces in the rightmost conjunct serving as the antecedent for a null pronoun in the initial conjunct.

(48) [V .... pro_i ... XP] conj. [V ... DP_i ... XP]

This configuration violates independently motivated restrictions on anaphora (see, e.g. Kroeger 1993:115-118) and is therefore untenable as a representation for sentences like (47). Subject lowering, on the other hand, offers a straightforward account of how the subject can be shared by both conjuncts yet surface in a position where it plainly does not scope over both conjuncts. Concretely, supposing that the subject originates in a relatively high position in the clause (e.g. Spec, TP) above the coordinate structure accounts for the fact that the subject is shared by each conjunct. Subject lowering then accounts for the position where the subject surfaces.

(49) [$_{TP}$ (SUBJ) [V .... XP] conj. [V ... SUBJ ... XP]

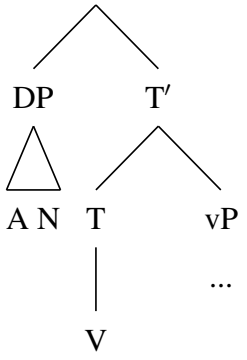
To my knowledge, no alternative to subject lowering has been offered to account for subject sharing in examples like (47).

[18]The shared subject in fact may surface in other positions as well, either in the initial or final conjunct. See Sabbagh 2014 for additional examples.

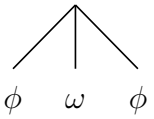
Sabbagh (2014:79-81) argues that subject lowering applies post-syntactically.[19] Supposing this, an important question that emerges is whether lowering applies before or after the mapping to prosodic structure has occurred (i.e. whether it apply to a syntactic representation or a purely phonological representation). I believe an argument can be made for claiming that subject lowering applies before the mapping to prosodic structure has occurred. In order to get to this argument, let us first consider what the motivation for subject lowering might be.

Assuming that subject lowering applies post-syntactically, it is presumably not motivated by the types of factors that movement operations are standardly assumed within Minimalism to motivate movement (e.g. as a consequence of the operation *Agree*, to eliminate uninterpretable features, etc.). There is, however, a relatively simple prosodic motivation for subject lowering based on the constraint BINARITY which was introduced earlier. Concretely, assuming that the verb raises to the head position of the projection, TP, and that the subject occupies the specifier of TP in the 'narrow' syntax (i.e. prior to subject lowering), then the structure of the clause without subject lowering would be as shown schematically in (50). If subject lowering were not to apply then the prosodic structure that would be formed on the basis of (50) would be, as shown in (51), a prosodic structure that plainly violates BINARITY.

(50)



(51)



A consequence of subject lowering is that the ϕ corresponding to the subject is, in effect, removed from the ϕ corresponding to TP and is instead included in the (binary branching) ϕ corresponding to vP (see the prosodic structures above).[20]

[19] Along with the argument offered for this by Sabbagh, one can add the fact that subject lowering does not appear alter binding or scope relations that are presumed to be established prior to subject lowering.

[20] Sabbagh (2014) suggests a different prosodically based motivation for subject lowering based on a constraint, WEAK start, which requires prosodic constituents to begin with a category that is no higher on the

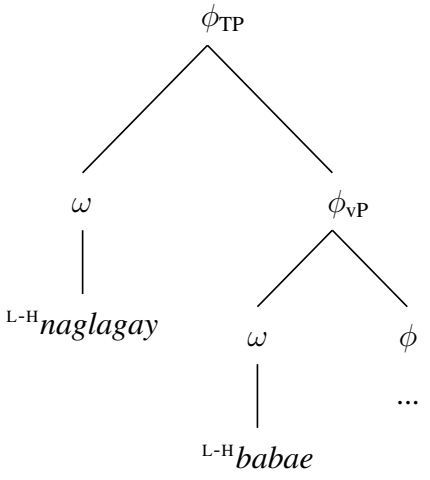
Consider now sentence (51). This sentence exhibits VSOIO word order but differs from other sentences with this word order that we have encountered so far in that the subject is simplex—i.e. consists just of a noun rather than a noun preceded by a modifying adjective. As the distribution of phrase accents in the annotated form in (52b) shows (see Appendix for pitch track), the immediately post-verbal subject is associated with a H-L phrase accent rather than a L-H phrase accent as we might expect by this point (cf. examples (1), (6), and (8))

(52) a. Naglagay ang baba'e ng malaking aklat sa sahig.
PERF.place S woman NS big.LK book LOC floor
'The woman put a large book on the floor.'

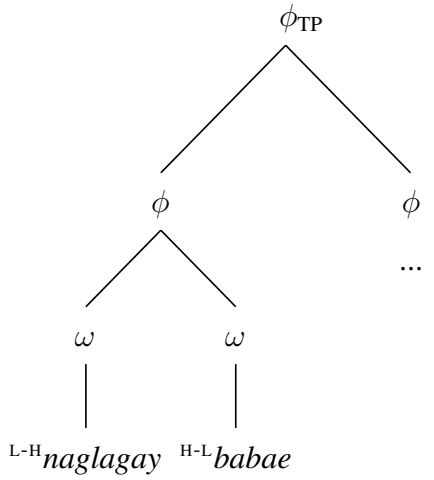
b. [$_{V}$ $^{\mathbf{L-H}}$Naglagáy] [$_{S}$ ang $^{\mathbf{H-L}}$babá'e] [$_{O}$ ng malakíng $^{\mathbf{H-L}}$aklát] [$_{IO}$ sa $^{\mathbf{HL}}$sahíg]
PERF.place S woman NS big.LK book LOC floor

Given the presumed syntactic structure for (52), MATCH PHRASE, and the constraint BINARITY, the prosodic structure and distribution of phrase accents one might expect for (52) is as shown in (53). However, the actual distribution of phrase accents suggests instead that (54) is the correct prosodic structure for (52).

(53)



(54)



To explain the 'emergence' of the prosodic structure in (54) over (53), I assume following Bennett et. al (to appear) a constraint EQUAL SISTERS in (55) (see also Myrberg 2010,

prosodic hierarchy than the prosodic constituent that follows. This constraint cannot be maintained, however, on the assumption that simplex subjects (e.g. as in example (56) discussed below in the main text) also undergo subject lowering.

2013).

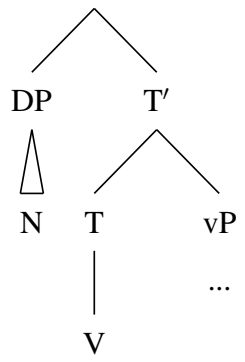
(55) EQUAL SISTERS

Sister nodes in a prosodic structure should be instantiations of the same prosodic category.

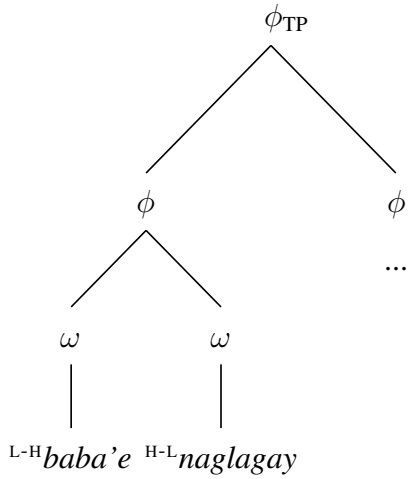
The prosodic structure in (53) incurs violations of EQUAL SISTERS at the level of ϕ_{TP} and ϕ_{vP} and is therefore dispreferred compared to the structure in (54). In short, whenever an immediately post-verbal subject is simplex (i.e. prosodically, an instantiation of ω rather than ϕ), the verb and the subject are grouped together under a single ϕ resulting in a structure that satisfies EQUAL SISTERS.

Returning now to our earlier question concerning the point at which subject lowering applies (before or after mapping has taken place), note that structures that satisfy EQUAL SISTERS also satisfy BINARITY. If subject lowering were to apply only after the mapping to prosodic structure has taken place, there would in effect no longer be a motivation for subject lowering when the subject is simplex. More concretely, both EQUAL SISTERS and BINARITY would be satisfied by a mapping from the syntactic structure in (56) (with no subject lowering and the subject in pre-verbal position) to the prosodic structure in (57).

(56)



(57)



It seems, then, that the subject needs to be in a post-verbal position prior to the point at which EQUAL SISTERS applies 'forcing' the subject and the verb to be incorporated into a single ϕ.[21] Put in other words, unless subject lowering applies *before* the mapping to

[21] The implicit assumption here is that mapping between syntax and phonology preserves relations of linear precedence.

prosodic structure, placing the subject in a post-verbal position, there would be no principled basis for choosing among the prosodic structure in (54) (with a post-verbal subject) and (57) (with a pre-verbal subject). Assuming that subject lowering applies before mapping, on the other hand, places the subject in a post-verbal position before mapping takes place, i.e. before the subject and verb are grouped together into a single ϕ.

If the reasoning here is valid, a potentially puzzling question emerges. Concretely, if subject lowering applies before the syntactic representation has been mapped to a phonological representation, how can it be motivated, as suggested above, by the constraint BINARITY—a constraint that is concerned with the organization of prosodic structure? If both claims are correct, this suggests a certain amount of 'look ahead' in the grammar (i.e. a operation applying to a syntactic representation must 'anticipate' the prosodic representation). This 'look-ahead', however, must be limited. In particular, subject lowering cannot 'know' how the final prosodic representation will be structured to accord with the constraint EQUAL SISTERS since, as argued above, prosodic structures which satisfy EQUAL SISTERS also comply with BINARITY. In other words, because EQUAL SISTERS bleeds the motivation for subject lowering, subject lowering must be able to apply without 'anticipating' how well the final prosodic representation will fair with respect to this constraint.

This type of interaction between the syntax and the phonology clearly goes beyond what is imagined to be possible on a purely modular view of grammar where operations applying to (purely) syntactic representations have no access to phonological information (cf. Pullum & Zwicky 1988; and most current work within Minimalism). Instead, the proposals here suggest a view of grammar of the type more recently argued for by Richards (2014) (see also Richards 2010; and Zec & Inkelas 1990 for an earlier argument) according to which operations applying to syntactic representations can have (limited) access to information about the phonological representation. In particular, the grammar can perform operations motivated by the phonology, but then "subsequently perform another operation that obscures the motivation for the first". As Richards (pp. 2) further describes this view (more baldly):

> "...[T]he grammar is building a kind of 'rough draft' of the final phonological representation, which can differ from the actual final phonological representation, and it is this rough draft which drives syntactic operations." (Richards 2014:2)

If the analyses offered here are are on the right track, then they provide important con-

firmation for this general view of the interaction of syntax and phonology, and additionally provide an important argument against a firmly modular view of grammar where operations affecting syntactic representations have no access to phonological information.

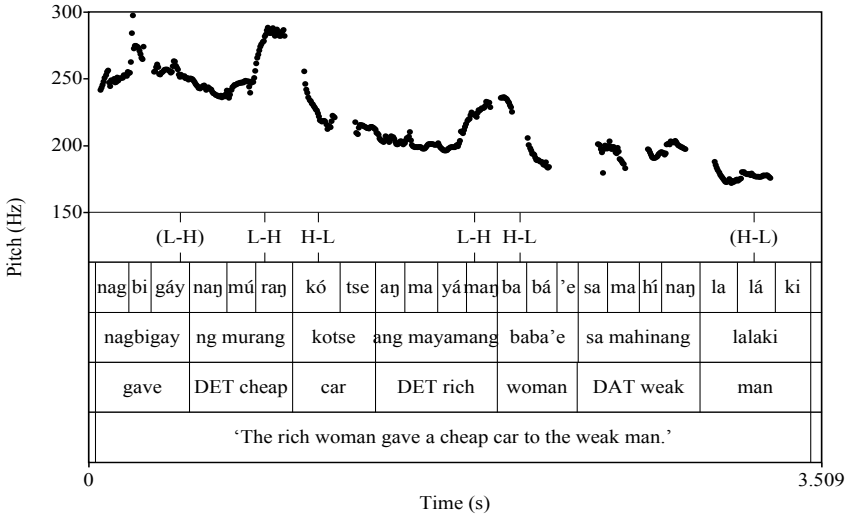
6 Conclusion

Research on the syntax-phonology interface has generally assumed that phonological rules do not have direct access to syntactic structure, but instead operate on a prosodic structure that is calculated from syntactic structure by a set of syntax-to-phonology mapping principles. Much of the research in this area has focussed primarily on identifying the prosodic structure needed to correctly describe phonological processes and then identifying the correct mapping principles needed to derive the prosodic structures from a syntax that is fairly well understood. Much less work, it seems, has been focused on finding phonological evidence for syntactic structure (see Wagner in press for recent discussion). This work has done just that by examining intonation in Tagalog and, in a certain sense, working backwards to deduce the correct syntactic structures from the the prosodic structure(s) needed to correctly describe the distribution of pitch rises and pitch falls. Working in this way, we were able to present a novel argument for the subject lowering account of verb initial word order in Tagalog. Ideally, similar types of phonological evidence can be used for other verb initial languages where the correct analysis of the phrase structure of these languages remains a matter of controversy.

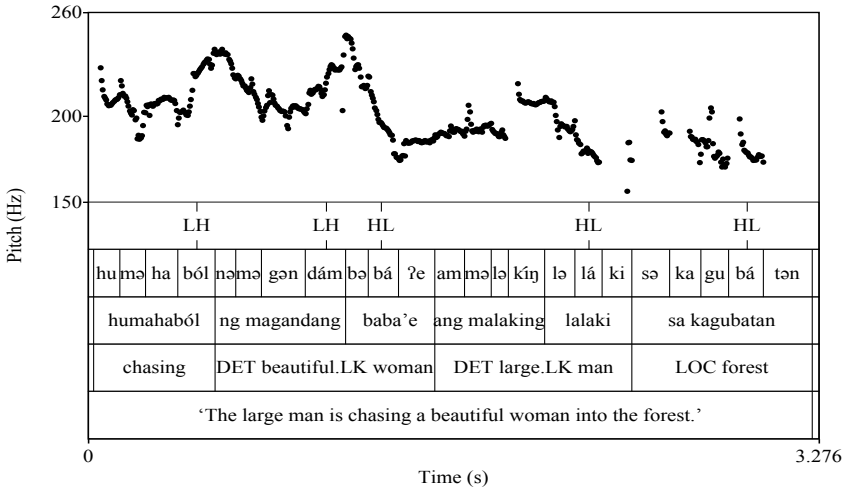
This work has also lead us to an conclusion about the interaction between syntax and phonology that is surprising from the traditional modular view of grammar according to which operations that apply to purely syntactic operations have no access to phonological information. One the analysis developed here, subject lowering applies to a syntactic representation but is motivated by a prosodic constraint. If this is correct, then prosodic information must be available even before the prosodic structure has been calculated from the syntactic representation. Crucially, access to prosodic information must however also be limited, for reasons that we argued above. All of this raises the important theoretical question of the extent to and depth to which phonological information can be accessed by the syntax, and. Significantly, these interactions must be constrained for the reasons clearly articulated by Pullum & Zwicky (1988). The important question, then, is how the grammar is organized to such that some aspects of phonological representations are available to syntax but not others.

Appendix

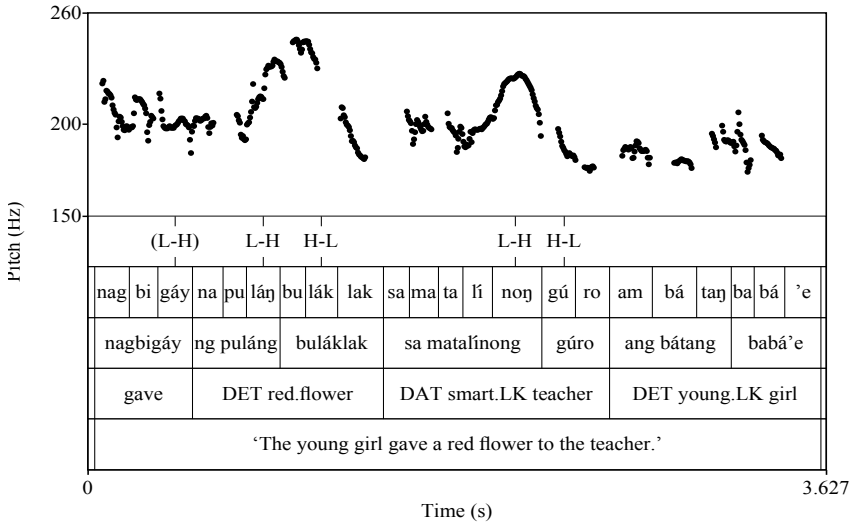
(58) PITCH TRACK FOR (34)



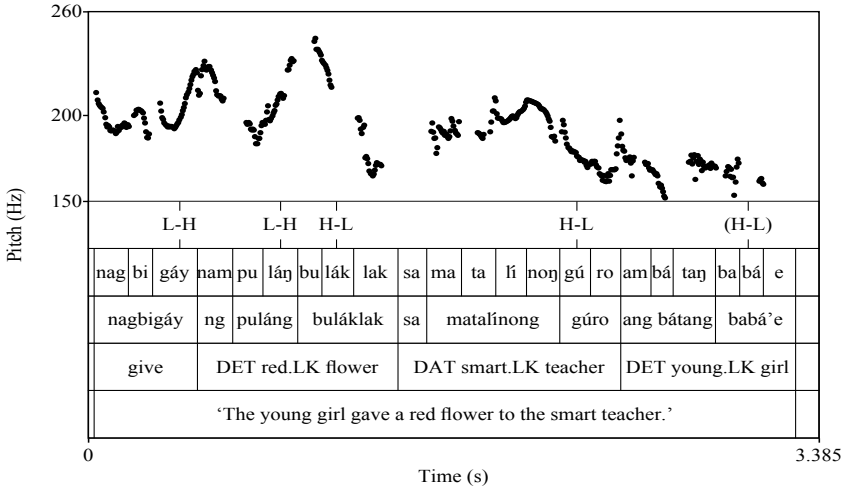
(59) PITCH TRACK FOR (35)



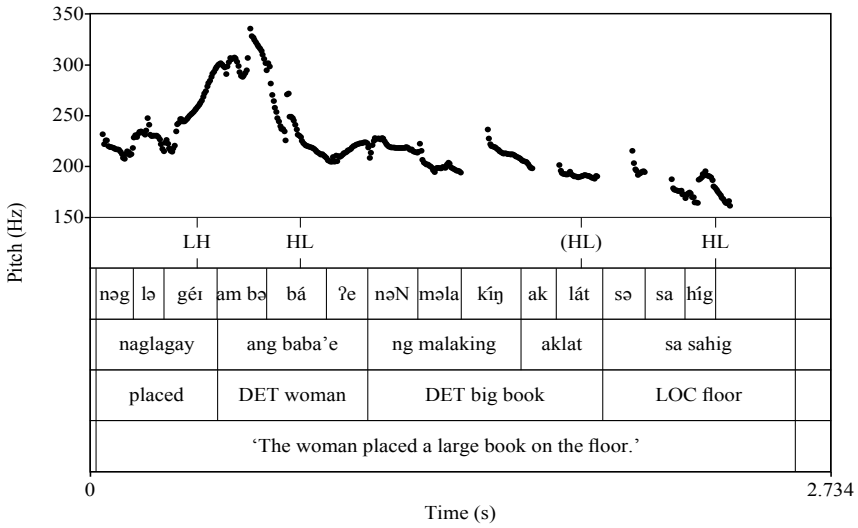
(60) PITCH TRACK FOR (36)



(61) PITCH TRACK FOR (37)



(62) PITCH TRACK FOR (52)



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