

# A minimalist approach to Korean prosodic phonology

Eon-Suk Ko

Brown University

## 1 Introduction

In Standard Korean, prosodic phonology is motivated by several phonological phenomena such as *n*-insertion (Han 1994, Kim 2000), lenis stop voicing (Silva 1989, Cho 1990, Jun 1993), and vowel shortening (Jun 1993), whose descriptions make reference to certain prosodic domains. The question of how such domains are formed has been discussed (Silva 1989, Cho 1990, Kang 1992), but has not been actively pursued since Jun (1993) has made an influential proposal to approach Korean phrasing from intonation rather than syntax.

This paper reconsiders this question and proposes a syntactic account of Korean prosodic domain based on the recent proposal of cyclic syntactic derivation through the multiple spell-out processes (Urigareka 1999, Chomsky 2000). In the present approach, the Accentual Phrase, hallmark of the intonational approach to Korean prosodic phonology, is no longer a primitive notion as its domain and tonal patterns are derived from a combination of syntactic and metrical information.

Among various perspectives on the derivation of prosodic domains, the Indirect Syntactic Approaches (Selkirk 1986, Nespor & Vogel 1986) have been actively applied to Korean phonological phenomena (Silva 1989, Cho 1990, Kang 1992). Jun (1993), however, criticized them for their inflexibility to predict the various range of possible phrasings and the misalignment between the syntactic and the prosodic structures. She instead proposed that phrasing in Korean is best characterized by the tonal pattern of the domain called Accentual Phrase (AP). Jun's observation of the coincidence between segmental rule domains and the tonal domain is an important contribution. As will be discussed, however, there are some fundamental issues with the AP theory such as the status of the tonal patterns of the AP in the grammar and the lack of an algorithm to predict the phrasing patterns.

Given the recent development of the phase and multiple spell-out theory in syntax (Chomsky 2000, 2001, et seq.), this paper explores the consequences of adopting the minimalist syntactic theory in studying Korean prosodic phonology along the lines of Dobashi (2003), Kahnemuyipour (2004), Kratzer & Selkirk (2007), and Ishihara (2007). It also adopts some of the notions of Distributed Morphology (Halle & Marantz 1994) which develops an elaborated theory of

derivation after spell-out in the PF. I will show that the present syntactic approach to phrasing is more advanced than the intonational approach in that it provides devices for deriving the intonational domain based on syntactic information.

## 1. Previous studies on prosodic phonology in Korean

### 1.1 Syntactic approaches

Previous studies of Korean prosodic phonology have mostly adopted the indirect syntactic theory of prosody, both from the perspective of end-based approach (Selkirk 1986, Selkirk & Shen 1990, and Chen 1987), and the relation-based approach (Selkirk 1978, 1980, Nespor & Vogel 1982, 1986, Hayes 1984). Specific proposals are summarized in the following.

- (1) a. Korean Phrase Formation (Silva 1989)
  - Major Phrase: {Left, X<sub>max</sub>}
  - Minor Phrase: binary branching, L-to-R
- b. Phonological Phrase formation rule (Cho 1990)
  - Apply the following rules cyclically to all maximal projections, proceeding from the bottom up. At any given stage, (a) applies before (b). Let the maximal projection under consideration on a given cycle be M.
  - (a) If M branches, combine the head of M into a Phonological Phrase with all adjacent unphrased material, up to and including the closest XP, or if no such phrase is present, the left edge of M.
  - (b) Phrase any focused word with the next word, unless that word is already phrased.
  - After (a) and (b) have applied in all possible environments, (c) applies.
  - (c) Unphrased words form Phonological Phases of their own.
- c. Korean Prosodic Phrase Rule (Kang 1992)
 
$$\text{Lex}^{\text{max}}[ \quad \rightarrow \quad \phi ($$

Differences in the details of the formulation notwithstanding, the rules in (1) share some common properties stemming from the adoption of the indirect syntactic approaches. First, the notion of the syntactic maximal projection, i.e. XP, plays an important role cross-categorially in the formulation of the rules. Second, while the proposed rules cover many of the prosodic phrasal patterns in Korean, they contain a theory-internal problem. That is, they allow only a rigid one-to-one mapping of the syntactic-to-prosodic structure. However, given that phrasing is affected by factors such as speech rate, prosodic weight, and semantics/pragmatics whereas the syntactic construction remains unchanged under these circumstances, they cannot cover the various range of phrasing patterns that actually occur.

## 1.2. Intonational approach to prosodic phonology of Korean

Jun (1993) has observed that the range of phrasing found in actual speech is broader than the one predicted by the syntactic approach. For example, syntactic approaches predict only the phrasing in (2a) but (2b) is also a possible phrasing.

- (2) a. (apeci-ka) (pang-e **d**ulega-si-nun-ke) (po-ass-ni?)  
father-NOM room-LOC enter-ADNOM COMP saw-Q  
'Did you see father going into the room?'
- b. (apeci-ka) (pang-e) (**t**ulega-si-nun-ke) (po-ass-ni?)  
father-NOM room-LOC enter-ADNOM COMP saw-Q

As a consequence, the onset of the verb *tulega* 'enter' is realized differently in (2a) and (2b): Lenis Stop Voicing, a domain-sensitive rule, applies only in the former and turns 'tu' into 'du'.

Jun also points out that patterns of prosodic phrasing do not always match the syntactic constituency boundary. For example, in example (3) below, a phrase boundary is often found to the right of the possessive pronoun *neney* 'your'. However, this is not predicted by a syntactic approach because the possessive pronoun is part of a syntactic constituent NP *neney tongsayngtayk* 'your brother's wife'.

- (3) (**neney**) (tongsayngtayk koyang-un) (eti-ni)?  
your brother's wife hometown-TOP where-Q  
'Where is your brother's wife's hometown?'

Based on such examples, Jun argues that Korean phrasal phonology cannot be determined by syntax but is better characterized by tonally defined prosodic domains. She observed that each prosodic domain is realized with a tonal pattern of LHLH in Seoul and LHL in Chonnam, regardless of how a syntactic phrase is parsed into prosodic domains. She calls the prosodic domain characterized by the aforementioned tones Accentual Phrase.

## 1.3 Problems with the intonational approach to phrasing in Korean

Despite the due criticism about the indirect syntactic approaches, however, it is not the case that Jun's intonational approach provides an alternative algorithm to "explain" the various phrasing patterns. First, the prosodic phrasing is not as completely unstructured as one might be led from the lack of such discussion in her theory. The examples (4a-b) illustrate that there are cases where a prosodic boundary can never intervene a syntactic constituent.

- (4) a. \*(On Monday) (morning Jane left).  
 b. \*(nay-ka elil) (ttay tokil-ey sal-ass-ta)  
 I-NOM young when Germany-LOC lived  
 ‘When I was young, I lived in Germany’

In an extreme interpretation of the intonational approach, the phrasing in (4b) should be fine as far as each prosodic domain is realized with the tonal pattern of LHLH or LHL. However, it is not possible to assign such tonal pattern in the prosodic domains in (4b), for which no explanation is provided in the AP theory.

Second, and a more fundamental issue with the intonational approach has to do with the origin of the phrasal tones: *where* in the grammar do the phrasal tones (e.g. LHLH, LHL) come from? Jun (1993) suggests that the phrasal tones are given at the underlying level without going into the details of the architecture of grammar assumed in her theory. We could think of a situation where the phrasal tones are listed in something called the ‘intonational lexicon’ (Lieberman 1975, Pierrehumbert 1980). The status of phrasal tones in Korean, however, is different from those of English in that Korean phrasal tones such as LHLH or LHL do not bear any meanings associated with them.<sup>1</sup> If the Korean phrasal tones are non-meaning bearing low-level phenomenon, they cannot be provided from the lexicon but should be inserted at a later level.

If the tones were to be inserted at or close to the level of phonetic implementation, this would mean that phrasing should also take place at this level as the definition of AP and the tonal pattern are flip sides of the coin in Jun’s theory. This is problematic because domain juncture “phonological” rules should have taken place before this level. The unavailability of tonal patterns before phrasing reflects the lack of algorithm in the intonational approach to predict the phrasing. From the perspective of a language learner, it would be a perplexing situation that s/he has to arbitrarily divide up the sentence and match each piece of the domains with certain tonal pattern, but the phrasing is nevertheless constrained by certain syntactic conditions (Jun 2002).

Thus, it becomes clear that we need a theory which can better handle the Korean phrasing phenomena.<sup>2</sup>

## 2. Theoretical grounds for the present study

Phrasal prosody involves different modules of linguistic grammar such as syntax, semantics/pragmatics, and phonology. In this section, I will state the assumptions of this study in each of these grammatical modules.

In syntax, I adopt the latest Minimalist framework (Uriagereka 1999, Chomsky 2000, 2001 et seq.) and assume that syntactic operations such as movement are done within a limited domain called *phase*. Then *spell-out* turns a syntactic structure with relevant constituent relationships into a string ready for phonological interpretation. Minimalist syntax dispenses with a global level of

S-structure as the conduit to the interpretive component. Therefore, there is nothing to stop material from being passed for interpretation multiple times. Thus spell-out operation takes place successively to build a single syntactic derivation, hence *multiple spell-out*. Following Kratzer & Selkirk (2007), I assume that spell-out operations include mapping of syntactic structure to default phrasing, which will be altered or completed through additional operations that take into consideration factors such as discourse, prosodic weight, speech rate, etc.

It is now a widely accepted idea that discourse has an impact on the phrasal stress/pitch accent patterns. I adopt the idea that there is a special notation of G-marking provided on informationally given/old constituents, and F-marking for contrastive/narrow focus (Rooth 1992, 1996; Féry and Samek-Lodovici 2006). Féry and Samek-Lodovici (2006) has suggested the following constraints to capture these general intuitions:

- (5) DESTRESS GIVEN: A given phrase is prosodically nonprominent.  
STRESS-FOCUS: A focused phrase has the highest prosodic prominence in its focus domain.

There have been two different kinds of focus discussed in discourse literature: informational/new vs. contrastive/identificational. The constraints suggested in (5) treat only the latter as a focus construction. The full array of stress patterns we observe in a language are explained through the interaction of the “default” phrasing and “discourse” influenced stress patterns as well as other constraints related to prosodic weight and speech rate (Kratzer & Selkirk 2007). This paper primarily focuses on deriving the “default” phrasing pattern and the phrasal stress derived from it.

Finally, it is necessary to make a few comments on the word-level prosody assumed in this study because phrasal prosody builds on or interacts with it. I describe the phrasal prosody in terms of stress proposed in Ko (2002, 2006) as opposed to tonal pattern in Jun (1993). Simply put, stress is on the initial syllable of a phrase if lexically accented; otherwise on the second syllable. The lexical accent roughly corresponds to a long vowel, which is lost in Modern Seoul.

Crucially, the first H tone in Jun’s AP translates to stress in the present analysis. An important consequence of translating the first H tone of the AP into an acoustic correlate of stress is that the phrasal tonal patterns of AP is no longer a primitive in Korean prosody as the pitch contour characterizing the Accentual Phrase can be derived from the metrical structure of Korean. For example, the tonal pattern LHLH of Seoul is derived from the stress on the second syllable one of whose acoustic manifestations is high pitch, and the boundary H tone. Chonnam does not have a boundary tone, so the acoustic manifestation of the lexical or phrasal stress yields a simple LHL pattern.

### 3. Phase and multiple spell-out theory of prosody: an overview

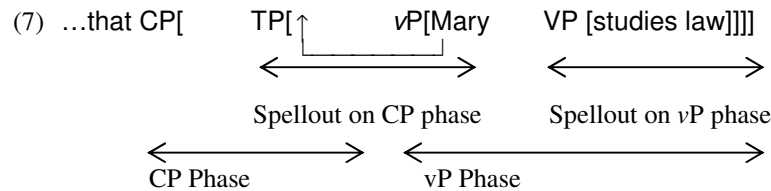
Some of the recent studies on the syntax-phonology interface have adopted the phase and multiple spell-out theory of minimalist syntax in deriving the prosodic domains, and have commonly proposed that a default prosodic domain is constructed as part of a spell-out operation (Krazer & Selkirk 2007, Dobashi 2003, Ishihara 2006, 2007).

This paper largely adopts the formulation of prosodic phrasing presented in Kratzer & Selkirk (2007), which argues that a syntactic phrase containing phrase stress corresponds to a prosodic domain (e.g. Major Phrase) as formulated in (6)

(6) The Highest Phrase Condition on prosodic spellout (Selkirk & Kratzer 2007, adapted from Kahnemuyipour 2004)

The highest phrase within the spell-out domain of a phase corresponds to a prosodic major phrase in phonological representation.

The following structure illustrates mapping of a syntactic structure to a prosodic domain according to the above condition:



Within the vP phase, the spell-out domain is the VP, where the highest phrase is the direct object 'law'. Thus a prosodic domain is formed as in (8).

(8) vP phase:

..... that Mary studies (law)

Note that the verb does not form a prosodic domain of its own because it is a head rather than a phrase. Thus a cross-linguistic prediction is made that the phrasal stress will always go on the direct object rather than the verb. The universal tendency to place prominence on direct object over verb was first captured by Kahnemuyipour (2004), and provides a strong motivation for allowing access to the hierarchical syntactic structure for phonology.

Subject, like direct object, also receives a stress in an all-new sentence. This is explained by assuming that the subject, positioned either in the [spec vP] or [spec TP], is given a prosodic domain and phrasal stress in the spell-out domain of the CP phase.

(9) CP phase:

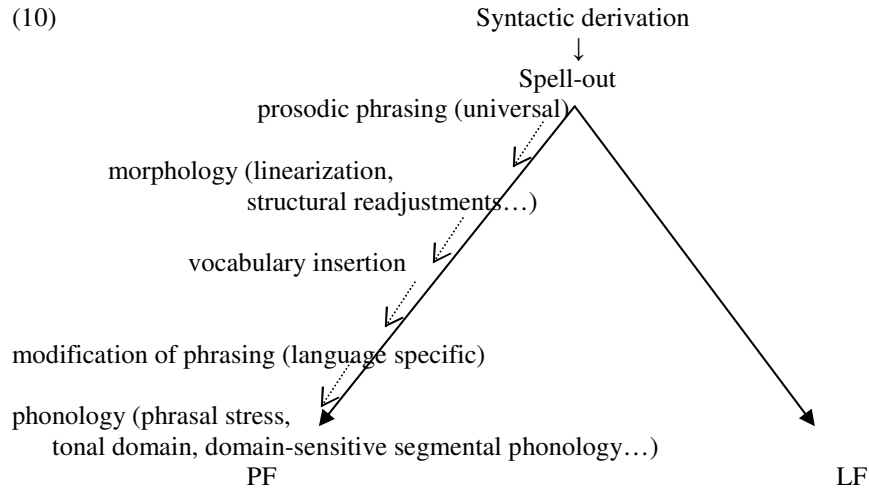
..... that (Mary) studies (law)

Phrase stress computation does not say exactly where within the highest constituent the phrase stress should fall (Kratzer & Selkirk 2007). When the highest phrase contains more than one word, the presence and position of the prosodic heads which represent the main stress of those phrases are determined in the phonological component, i.e. at PF. Language particular location of stress within the prosodic phrase derived in spell-out is determined at this stage.

I also assume that factors affecting the phrasing such as the discourse effect, prosodic weight, and speech rate come into play at PF. For example, the effect of discourse on phrasing could be explained through the DESTRESS-GIVEN and STRESS-FOCUS constraints while prosodic weight could also be explained through constraints such as UNIFORMITY. The effect of speech rate is a bit trickier to formulate in terms of constraints, but Pak (2006)'s idea that there is a stage at the PF where the number and size of prosodic phrases are decided could yield a solution that is compatible with the current theory. Details of how each of these factors is formulated need to be further worked out.

Incorporating the ideas in recent proposals of syntax-phonology interface (Kratzer & Selkirk 2007, Ishihara 2007, Pak 2006) into the derivational model of Distributed Morphology, this study assumes the following architecture of grammar:

(10)



The grammatical model proposed in (10) is different from that assumed in indirect syntactic approaches (Selkirk 1986, 1995; Nespov & Vogel 1986; Truckenbrodt 1999) in some important aspects. As the syntactic model is based

on the multiple spell-out theory of minimalism, derivation of prosodic phrases is also done in a cyclic fashion (Embick 2006). In other words, unlike previous models of syntax-phonology interface where prosodic structure was built on a finished syntactic derivation, syntactic derivation and phonological derivation are derivationally interweaved in the current approach. The empirical consequence of such difference still needs to be investigated.

Another striking difference is that, in the present approach, the notion of maximal projection (XP) does not play any role in characterizing the interface of syntax and phonology, compatible with the bare phrase structure assumed in minimalist syntax. Instead, only certain syntactic configurations, i.e. syntactic complements of phase heads, are privileged as the locus of that spell-out. As a consequence, some of the terminal strings remain unparsed into prosodic domains at the spell-out but are subject to further operation at PF. Kratzer & Selkirk (2007) characterizes such a theory a radical *minimalist* and a *universalist* theory of prosodic phrasing: minimalist because there is no interface constraints that may produce an independent level of prosodic domains that do not coincide with syntactic constituents, and universalist theory because no language particular parameters are assumed that can derive different prosodic phrasings from language to language.

#### 4. Application of the theory to Korean data

##### 4.1 Relative prominence of object over verb in a VP

Kahnemuyipour (2004)'s observation of the cross-linguistic tendency that a phrase stress is placed on an object rather than a verb also applies in Korean. Korean data in (11) illustrate that the object NP, the highest phrase within the VP, is realized with the phrasal stress.

- (11) a. yeonghwuni-ga [VP [ NP[yengmwúnhak-ul] cengongha-n-ta ] v] vP.  
 Yeonghun-NOM English -ACC major in  
 'Yeonghun majors in English Literature'  
 b. tokki-ga [VP [ NP[naysmwúl-ul] manna-ess-e-yo ] v] vP.  
 rabbit-NOM river-ACC met  
 'The rabbit came across a river'  
 c. motwutul elssaanko [VP [ NP[manséy-lul] pwulu-ess-e-yo ] v] vP.  
 everyone hug-CONJ hurray-ACC shouted  
 'Everyone hugged each other and shouted hurray'

To illustrate, the object is first formed as a prosodic domain on the vP phase, and then the subject on the CP phase.

- (12) a. yenghwuni-ka (yengmwúnhak-ul) cengongha-n-ta.  
 Younghun-NOM English-ACC majors-in  
 vP phase: highest phrase is the object NP *yengmwunhak-ul* 'English'.

b. (yenghwúni-ka) (yengmwúnhak-ul) cengongha-n-ta.

Younghun-NOM English-ACC majors-in

CP phase: highest phrase is the subject NP *yenghwuni-ka* ‘Younghun- NOM.

The same principle applies to an argument PP as in (13), where the phrasal stress is on the PP rather than the verb.

(13) ecey [<sub>VP</sub> [<sub>PP</sub> [patáska-ey] ka-ess-ta <sub>v</sub>] <sub>VP</sub>].  
yesterday beach-LOC went  
‘We went to the beach yesterday’

This incomplete prosodic parsing at spell-out undergoes a further PF operation to completely parse each word. We can assume that the verb is encliticized to the preceding prosodic domain in Korean.

(14) (yenghwúni-ka) ((yengmwúnhak-ul) cengonghanta).  
Younghun-NOM English-ACC majors-in

If, however, the unparsed verb is phonologically heavy, it may form its own prosodic domain. Compare the heavy verb in (15b) to the light one in (15a).

(15) a. (unjíni-nun) (sensáyngnim-kkey) ((sagwá-lul) hay-ess-ta)  
Eunjin-NOM teacher-DAT apology-ACC did  
‘Eunjin apologized to the teacher’  
b. (sensáyngnim-un) (sakwá-lul) (patátuli-si-ess-ta).  
teacher- NOM apology-ACC accepted  
‘The teacher accepted (her) apology’

The influence of prosodic weight on phrasing suggests that the encliticization should occur at PF after the Vocabulary Insertion process.

#### 4.2 The case of Applicative

Researchers have different opinions as to where in the syntactic hierarchy the Applicative is base-generated, particularly about whether it is outside or inside the VP. In view of the proposal made in this paper that the derivation of phrasing mirrors syntactic structures, it would be interesting to examine the pattern of phrasing. The data in (16) suggest that there is resistance to prosodically grouping the locative and the VP together in all new, neutral contexts.

(16) a. (na-nun) (itayli siktang-eyse) (suphagethi-lul mek-ess-ta)  
I-TOP Italian restaurant-LOC spaghetti-ACC ate  
‘I ate spaghetti at an Italian restaurant’  
b. \*(na-nun itayli siktang-eyse) (suphagethi-lul mek-ess-ta)  
I-TOP Italian restaurant-LOC spaghetti-ACC ate

- c. \*(na-nun) (itayli siktang-eyse suphagethi-lul) (mek-ess-ta)  
 I-TOP Italian restaurant-LOC spaghetti-ACC ate

The same tendency can be found in the double object construction in Korean, i.e. it appears that the indirect object belongs to a different prosodic domain from the VP.

- (17) a. (na-nun) (senwu-hanthey) (chayk-ul seykwen cwu-ess-ta).  
 I-TOP Sunwoo-DAT book-ACC three-volumes gave  
 'I gave three books to Sunwoo'  
 b. \*(na-nun senwu-hanthey) (chayk-ul seykwen cwu-ess-ta).  
 I-TOP Sunwoo-DAT book-ACC three volumes gave  
 c. \*(na-nun) (senwu-hanthey chayk-ul) (seykwen cwu-ess-ta).  
 I-TOP Sunwoo-DAT book-ACC three-volumes gave

The emerging generalization from the examples in (16-17) is that the applicative belongs to a separate spell-out domain from the direct object or the subject. In other words, the phrasing data indicate that the IO should be outside of the VP, the spell-out domain in the  $\nu$ P-phase.

Note that independent arguments have been made that IO is merged outside VP (e.g. H. Ko 2005). If the syntactic arguments for assuming the IO being generated outside the VP are correct, then this serves as another example of phrasing closely mirroring that of syntactic structure.

#### 4.3 The case of pronouns

Indefinite pronouns do not have phrasal stress even when they are the highest phrase within a spell-out domain. This seems to be true cross-linguistically. Observe the lack of stress in German pronominal object *was* 'something' in (18a), taken from Kratzer & Selkirk (2007), where the stress instead goes to the verb by default. In (18b), the lack of stress on the highest phrase *was* leads to the stress on the next highest phrase, PP.

- (18) a. Ich hab' gehört, dass María [was gekáuft hat].  
 I have heard that Maria something bought has  
 'I've heard that Maria has bought something'  
 b. Ich hab' gehört, dass María [was im Súpermarkt gekauft hat].  
 I have heard that Maria something in the supermarket bought has  
 'I've heard that Maria has bought something'

Consider the parallel examples from Korean. In (19a), the phrasal prominence is not on the pronominal object *mwel* 'something' but instead falls on the verb. In (19b), on the other hand, a prominence falls on the direct object

NP *lamyen* ‘ramen’ as it is the non-pronominal highest phrase within the VP.

- (19) a. aki-ka [<sub>VP</sub> [<sub>NP</sub> mwel] mek-éss-ta-ten-tey] <sub>v</sub> ] <sub>VP</sub>.  
 baby-NOM something ate-DC-IN  
 ‘(I heard) that the baby ate something’
- b. aki-ka [<sub>VP</sub> [<sub>NP</sub> lamyén-ul] mek-ess-ta-ten-tey] <sub>v</sub> ] <sub>VP</sub>.  
 baby-NOM ramen-ACC ate-DC-IN  
 ‘(I heard) that the baby ate ramen’

Compare the situation with the *wh*-pronoun object *mwel* ‘what’ in (20), which stays in situ thus the highest PP in the VP.

- (20) aki-ka [<sub>VP</sub> [<sub>NP</sub> nwél] mek-ess-ni] <sub>v</sub> ] <sub>VP</sub>?  
 baby-NOM what ate-Q  
 ‘What did the baby eat?’

In contrast to the case of the indefinite pronominal object in (19), the *wh*-pronominal object in (20) receives a phrasal stress.

Kratzer & Selkirk (2007) conjectures that the ineligibility of pronouns (and function words in general) to receive phrase stress must be specified in the grammar. Meanwhile, Jun & Oh (1996) suggests that the indefinite pronoun and the *wh*-pronoun are distinguished by accentual phrasing.

My proposal is a hybrid of these suggestions: the absence of phrasal stress on the indefinite-pronoun is because of the role of the discourse-based constraint DESTRESS-GIVEN (Féry & Samek-Lodovici 2006) in phrasing.<sup>3</sup> That is, the specification for the ineligibility of stress for pronoun is indirectly stated in terms of G-marking and the discourse based constraint DESTRESS-GIVEN, which prohibits the G-marked pronouns, but not the *wh*-pronouns, from being placed in a prosodically strong position in the prosodic domain – left edge in the case of Korean.

- (21) a. (kongwén-eyse nwukwu-lul<sub>G</sub>) (manná-ass-ta-ko)? *indefinite pronoun*  
 park-LOC someone-ACC met-Q  
 ‘You mean you met someone in the park?’
- b. (kongwén-eyse) (nwukwú-lul) manna-ass-ta-ko)? *wh-pronoun*  
 park-LOC who-ACC met-Q  
 ‘Who did you say you met at the park?’

The case of possessive pronouns, which Jun pointed out as a problem in syntactic approach because of the intervening prosodic domain boundary within an NP can be also explained along this line.

- (22) a. neney<sub>G</sub><sup>4</sup> (tongsáyngtayg kohyang-un) (etí-ni)?  
 your brother's wife hometown-TOP where-Q  
 'Where is your brother's wife's hometown?'  
 b. \*(nenéy<sub>G</sub> tongsayngtayg kohyang-un) (etí-ni)?  
 your brother's wife hometown-TOP where-Q

If the possessive pronoun is phrased together with the N, as in (22b), the phrasal stress will fall on the pronoun, resulting in the violation of DESTRESS-GIVEN.

#### 4.4. Cases to be further explored

This paper has merely introduced the direct syntactic approach to Korean prosodic phonology based on the phase theory and details of analyses to cover empirical data with diverse syntactic configurations still need to be worked out. I will take two particular cases that need further analyses.

One has to do with the tendency for some adverbs such as *acu* 'very', *cengmal* 'really', *cincca* 'truly', *nemu* 'too' to avoid being grouped together with the adjectives they modify, which has been pointed out as a problem of syntactic approach in Jun (1993). Here are some examples:

- (23) a. (nemú) (chuwé poi-ess-eyo)  
 too cold seemed-PAST  
 'Someone seemed very cold.'  
 b. (igé-n cincca) (cohún kulim-iya)  
 this-TOP truly nice picture- COP  
 'This is a truly nice picture.'

The adverbs that avoid being grouped with the adjective they modify seem to belong to the class of *degree adverbs*. That they behave in a special way in syntax and prosody have been already widely observed in the literature, so we could find a clue for explaining the behavior of these Korean adverbs from a more refined syntactic structure of the adjective phrases involving them.

Another case that requires more work has to do with the prosody involving relative clauses. As Jun (1993) notes, Korean relative clauses do not show a consistent pattern as to whether or not they prosodically group together with the noun they modify. A more elaborate syntactic analysis of relative clause construction and the formulation PF restructuring processes motivated by prosodic weight and speech rate will help us better explain the phrasing in complex constructions.

## 5. Conclusion

The present study considered Korean phrasing anew by adopting the phase theory of minimalist syntax. It described Korean phrasal prosody in terms of phrasal stress rather than tones, which theoretically implies that 'dephrasing' characterizing prosodic realization of focus in Korean is essentially

'deaccenting'. This study supported the model of grammar where a universal prosodic domain is constructed at spell-out, and language- or dialect-particular differences is achieved through PF operations in the phonological component. The on-going investigations in syntax regarding what exactly counts as phase and spell-out domain are expected to help develop a more refined theory of syntax-to-prosody mapping at spell-out.

## Notes

\*I thank Jeong-Seok Kim for answering my questions on syntax and providing helpful references. I also thank Marjorie Pak and Michael Kenstowicz for sending me their papers on related issues.

<sup>1</sup> Boundary tones are a different matter as they signal the continuation/end of the sentence or a declarative/question mode.

<sup>2</sup> A constraint-based approach such as Optimality Theory (OT) could perhaps accommodate the situation where phrasing, phonological rule application, and tonal insertion would be simultaneously accounted for on surface. However, as will become clearer towards the end of the paper, OT has a limit of its own as a theory for explaining phrasing because it operates on a string of words rather than hierarchical structure, and assumes only one level of phrasing.

<sup>3</sup> It is not clear whether the discourse-based constraints are present before or after the PF stage. Kratzer & Selkirk (2007) seem to assume them before spell-out, but does not provide any evidence for it.

<sup>4</sup> The unparsed G-marked word may be parsed into a prosodic domain later in the PF to conform to the prosodic hierarchy.

## References

- Cho, Young-Mee Yu. 1990. Syntax and phrasing in Korean. *The phonology-syntax connection*, ed. by Sharon Inkelas and Draga Zec. Chicago: University of Chicago Press.
- Chomsky, Noam. 2000. Minimalist inquiries: The framework. In *Step by step: In honor of Howard Lasnik*, ed. by Roger Martin, David Michaels and Juan Jriagereka, 85-155. Cambridge, Mass.: MIT Press.
- Chomsky, Noam. 2001. Derivation by phase. In *Ken Hale: A life in language*, ed. by Kenstowicz, 1-52. Cambridge, Mass.: MIT Press.
- Dobashi, Yoshihito. 2003. Phonological Phrasing and Syntactic Derivation. Ph.D. Thesis. Cornell University.
- Embick, David. 2006. Linearization and local dislocation: Derivational mechanics and interactions ms., University of Pennsylvania.
- Féry, Caroline and Samek-Lodovici, Vieri. 2006. Focus projection and prosodic prominence in nested foci. *Language* 82.131-50.
- Halle, Moris and Alec Marantz. 1984. Some key features of Distributed Morphology. *MIT Working Papers in Linguistics* 21. 275-288

- Ishihara, Shinichiro. 2007. Major Phrase, Focus Intonation, Multiple Spell-Out. *Linguistic Review*, 24.
- Jun, Sun-Ah. 1993. The phonetics and phonology of Korean prosody, Ph. D. Thesis, Ohio State University.
- Jun, Sun-Ah. 1998. The accentual phrase in the Korean prosodic hierarchy. *Phonology* 15.189-226.
- Jun, Sun-Ah and Oh, Mira. 1996. A Prosodic analysis of three types of wh-phrases in Korean. *Language and Speech*, 39.1.37-61.
- Kahnemuyipour, Arsalan. 2004. The syntax of sentential stress, University of Toronto, Ph. D. Thesis.
- Kim, Su-Jung. 2000. Accentual effects on segmental phonological rules in Korean, Ph. D. dissertation, UNC-Chapel Hill.
- Ko, Eon-Suk. 2002. The phonology and phonetics of word level prosody and its interaction with phrasal prosody: A study of Korean in comparison to English. University of Pennsylvania, Ph. D. Thesis.
- Ko, Heejeong. 2005. Syntactic edges and linearization. MIT, Ph.D. Thesis.
- Kratzer, Angelika and Selkirk, Elizabeth. 2007. Phase theory and prosodic spellout: The case of verbs. *The Linguistic Review*, 24.
- Liberman, Mark. 1975. The Intonational System of English, Ph. D. Thesis, MIT.
- Nespor, Marina and Vogel, Irene. 1986. *Prosodic phonology*. Dordrecht: Foris.
- Pak, Marjorie. 2006. The postsyntactic derivation and its phonological reflexes. ms., University of Pennsylvania.
- Pierrehumbert, Janet. 1980. The phonology and phonetics of English intonation Ph. D. Thesis, MIT.
- Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics*, 1.75-116.
- Selkirk, Elizabeth. 1986. Derived domains in sentence phonology. *Phonology Yearbook*, 3.371-405.
- Silva, David James. 1989. Determining the domain for intervocalic stop voicing in Korean. *Harvard Studies in Korean Linguistics*, 3.177-88.
- Truckenbrodt, Hubert. 1999. On the relation between syntactic phrases and phonological phrases. *Linguistic Inquiry*, 30.219-55.
- Urigareka, Juan. 1999. Multiple Spell-out. In *Working Minimalism*, ed. by Samuel David Epstein and Norbert Hornstein, 251-82. Cambridge, Mass.: MIT Press.

Department of Cognitive & Linguistic Sciences  
 Brown University  
 Providence, RI 02912, U.S.A.  
 e-mail:esko@brown.edu