Prosodic Structure and Focus Prosody of South Kyungsang Korean

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This paper shows how focus prosody of South Kyungsang Korean interacts with the prosodic structure of the dialect. Based on the prosodic structure defined by intonation, it is claimed that the domain of lexical pitch accent assignment is a Prosodic Word, but the prosodic domain of focus, or the realization of focus prominence, is an Accentual Phrase. This model can explain the phenomenon of mismatch between the domain of semantic focus and the domain of accent/prosodic prominence.

1. Introduction

Focus connects a sentence to previous utterances by highlighting a constituent in the sentence. The highlighting can be achieved either by morphological markers, syntactic word order, prosodic prominence, or any combination of these. Though languages differ in their way of highlighting, prosodic resources, in particular, seem to serve this function in many languages. The most commonly accepted view of focus prosody is that a focused word should be maximally prominent, i.e., accented (e.g., Focus-to-Accent theory by Gussenhoven (1983) or the Focus Prominence constraint by Truckenbrodt (1995) and Buring (2003, 2006)). However, how focus utilizes prosodic resources to deliver prosodic prominence would depend on the prosodic system of an individual language. Therefore, the study of the prosodic effect of focus should be preceded by the establishment of the prosodic system.

In this article, we introduce the prosodic system of South Kyungsang Korean (SKK), a lexical pitch accent dialect of Korean mainly spoken in the southeastern part of Korea, and show how focus prosody interacts with the prosodic system of the dialect. The focus realization of SKK is very interesting because the domain of informational focus does not always match the prosodic domain where the focus effect is realized. The following sentence illustrates this point. In (1), N1 *nongkwu* 'basketball' is narrowly focused. However,

the focused pitch accent, i.e., the highest peak triggered by focus, is on N2 *kamdok* 'director' (The word in bold is where semantic focus is given and the word in capital letters is where focused pitch accent is realized. The same convention will be used throughout the paper).

(1) wulinun   **nongkwu**   KAMTOK-UL   wenhanta.
     We   **basketball** DIRECTOR-ACC   want
     'We want a **basketball** director (not a **baseball** director).'

This apparently violates the straightforward application of the Focus-To-Accent (FTA) theory or the Focus Prominence theory. In this article, we will show that even a narrow focus, which is generally known to obey a straightforward FTA mapping principle, is sensitive to the prosodic structure of a sentence. That is, the focus realization in SKK is influenced by the type of lexical pitch accent and whether the lexical pitch accent is fully realized or not. Our main questions in this paper are what the domain of pitch accent in the SKK prosodic structure is and how it affects the focus realization. To answer this, we will first outline the prosodic structure of SKK.

2. A Prosodic Structure of South Kyungsang Korean

   South Kyungsang Korean differs from Standard (Seoul) Korean and Western dialects of Korean in that the pitch pattern of a word is distinctive. (2) shows three words that have an identical segmental string but differ by their tonal contours.

(2) a. kaci   HL 'type'   b. kaci   HH 'branch'   c. kaci   LH 'eggplant'[1]

Unlike a tone language such as Chinese, SKK does not allow any type of tonal combinations over a syllable. Instead, it has limited patterns of tonal contours. The first syllable of a word can be either L or H but there cannot be a sequence of L tones word-initially, and once there is falling pitch from H to L, there cannot be rising pitch to H again. For example, in tri-syllabic words, while eight types of tonal contours are theoretically possible, only four types of tonal contours are found in SKK. An example of each type is shown in (3).

(3) a. H   L   L   b. L   H   L   c. H   H   L   d. L   H   H
        mye nu li   *mi na li*   *mwu ci kay*   *pok swung a*
        'daughter-in-law'   'parsley'   'rainbow'   'peach'

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[1] The Korean transcription here follows the Yale Romanization System.

The prosodic system of the South Kyungsang dialect has been analyzed either as a tone language (e.g., Ramsey 1975, 1978, Huh 1985 (cited in S-E Chang 2007), C-G Gim 1994, 1998, H-Y Lee 1997, S-E Chang 2007) or as a pitch accent language (e.g., Kenstowicz & Sohn 1997, 2001, D Lee 2005, 2009, J Kim 2008). Previous studies which proposed a tonal analysis assume that each syllable of a word is lexically specified with a tone (High, Mid, Low, or Rising). However, as mentioned above, the surface tonal pattern of SKK words is not random, as predicted from a tonal analysis, but shows that each word does not have two f0 (pitch) peaks. This means each word is the domain of pitch prominence, suggesting SKK is a pitch accent dialect (cf. Beckman 1986, S-A Jun 2005, Hyman 2006). That is, only a certain syllable in a word is tonally specified in the lexicon, and the tones of other syllables are assigned either by a rule, different registers, or their prosodic context and tone interpolations. Among the models of pitch accent system, however, Kenstowicz and Sohn's model and D Lee's model examined the tonal pattern of each word in isolation or in a sequence of two words (a compound or a phrase). J Kim's model, on the other hand, examined the tonal pattern of a word or a phrase by considering the intonation pattern of an utterance, in the framework of Autosegmental-metrical phonology of intonation (also known as Intonational Phonology; Beckman & Pierrehumbert 1986, Pierrehumbert & Beckman 1988, Ladd 1996), thus similar to the pitch accent model of North Kyungsang Korean by Jun, Kim, Lee and Jun (2006).

In this paper, we will adopt J Kim's model and argue that the four tonal patterns that appear in tri-syllabic words in SKK can be explained by lexically assigned pitch accents combined with boundary tones belonging to different prosodic units. We will also show that the variation of tones in forming a larger prosodic phrase is explained by the prosodic properties of the phrase, not by stipulating a rule or assuming a register.

According to J Kim's prosodic structure of SKK, there exist three prosodic units larger than a Word: an Intonation Phrase (IP), an Intermediate Phrase (ip), and an Accentual Phrase (AP). An IP can have one or more ips and is marked by a boundary tone realized on the phrase-final syllable which is substantially lengthened. The boundary tone delivers sentence type information as well as pragmatic and discourse information. For example, a Low boundary tone (L%) is for declaratives or imperatives, a High boundary tone (H%) is for interrogatives, and a falling boundary tone (HL%) marks the end of a topic phrase. An ip is the domain of downstep or pitch range reset and can have one or more APs. An AP can have more than one Prosodic Word (a stem/root plus particles/endings) but has only one pitch accent, and is marked by a Low boundary tone (La) realized at the beginning of the phrase. Unlike Tokyo Japanese, every Prosodic Word in SKK has a pitch accent. Syllables that are not lexically specified for tones or not assigned a tone post-lexically (i.e., a

boundary tone) get their pitch values by interpolation between neighboring tones (for a similar analysis of Japanese pitch accent, see Pierrehumbert & Beckman 1988).[2]

Unlike Tokyo Japanese which has only one type of pitch accent (H+L), SKK has two types of pitch accent, H+L and H+H (J Kim 2008). Each type of pitch accent is associated with two consecutive syllables. It can be linked to either the first and the second syllable, or the second and the third syllable of a word, thus creating four tonal contrasts. That is, each word is lexically speci-fied with the type of pitch accent as well as the location of pitch accent. These tonal contrasts are illustrated in (4) by the autosegmental representation of pitch accent of the tri-syllabic words in (3). [Note that when an autosegmental representation of the tonal contrast is not used, we will distinguish these four tonal contrasts by a subscript 1 and 2, referring to the location of the syllable in a word with which the first tone of pitch accent is associated. That is, H_1+L is when H and L are associated with the first and the second syllable of a word, respectively, while H_2+L is when H and L are associated with the second and the third syllable of a word, respectively. (4e) shows the non-autosegmental linear representation of the tonal contrast for the tri-syllabic words in (4a-d).]

(4) a.   H+L   b.   H+L   c.   H+H   d.   H+H
          | | | | | | | |
       mye nu li   mi na li   mwu ci kay   pok swung a
     'daughter-in-law'   'parsley'   'rainbow'   'peach'
     e. meynuli   minali   mwucikay   pokswunga
        (H_1+L) (H_2+L) (H_1+H) (H_2+H)

When these tri-syllabic words are produced in isolation, however, each word is produced in one IP, which means it is also one ip and one AP, assuming the Strict Layer Hypothesis (Selkirk 1986). That is, the beginning of the word, by being the beginning of an AP, is marked by a Low boundary tone (La), and the end of the word, by being the end of an IP, is marked by a Low boundary tone (L%) indicating a declarative utterance. An example pitch track of the tri-syllabic words produced in isolation is shown in (5). For each pitch track, there are four tiers describing the segmental and tonal representation of the word: the Gloss tier showing the meaning of the Korean word, the Syllable tier showing the boundary of each syllable of the utterance, the Utone tier show-ing the underlying tonal representation aligned with the host syllable, and the Stone tier showing the surface tonal representation (i.e., the AP boundary tone,

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[2] Though the tonal patterns of each prosodic unit differ between J Kim's model of SKK and Pier-rehumbert and Beckman's model of Tokyo Japanese, the prosodic hierarchy of these two mod-els is virtually identical. The Intonation Phrase in J Kim's model corresponds to the Utterance in P & B's model.

pitch accent, and the IP boundary tone). The same format will be used for all pitch tracks throughout the paper.

(5) Example Pitch Tracks of Tri-syllabic Words in (3)
     (a) *meynuli*   (b) *minali*   (c) *mwucikay*   (d) *pokswunga*[3]

Gloss	daughter-in-law			parseley			rainbow				peach	
syllable	myenu	li		mi	na	li	mwu	ci	kay		pokwung	a
Utone	H+L				H+L		H+H				H+H	
Stone	La H+L		L%	La	H+L	L%	LaH+H			L%	La	H+H	L%

As shown in (5), both (a) and (c), where the first syllable is lexically specified with a H tone, show a rising tone pattern at the left edge of a word, and all words show a falling tone pattern at the right edge of a word regardless of whether the last syllable is lexically specified with a High tone or not, suggesting the existence of a Low boundary tone at the phrasal level.

Further evidence of a Low boundary tone can be shown from a pair of words in (6). Both of the words in (6) have the same type of a pitch accent, H+L, but the pitch accent is assigned on the first and second syllables of the word (i.e., word-initially) in (a) and on the second and third syllables of the word (i.e., word-finally) in (b). As shown in (7), while the AP boundary L tone (La) is fully realized in the first syllable of *minali* 'parsley' in (6b), the AP boundary tone of the first syllable in *myenuli* 'daughter-in-law' in (6a) is not fully realized, i.e., undershot, due to the lexical H tone associated with the first syllable.

(6) a. La H+L   L%   b. La   H+L   L%
        [[mye nu li ₚw]ₐₚ]ᵢₚ 'daughter-in-law'   [[mi na li ₚw]ₐₚ]ᵢₚ 'parsley'

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[3] Pitch tracking is failed during the first syllable of this word, *pok*.

(7) Example Pitch Track of Tri-syllabic Words in (6)
     (a) *meynuli*   (b) *minali*
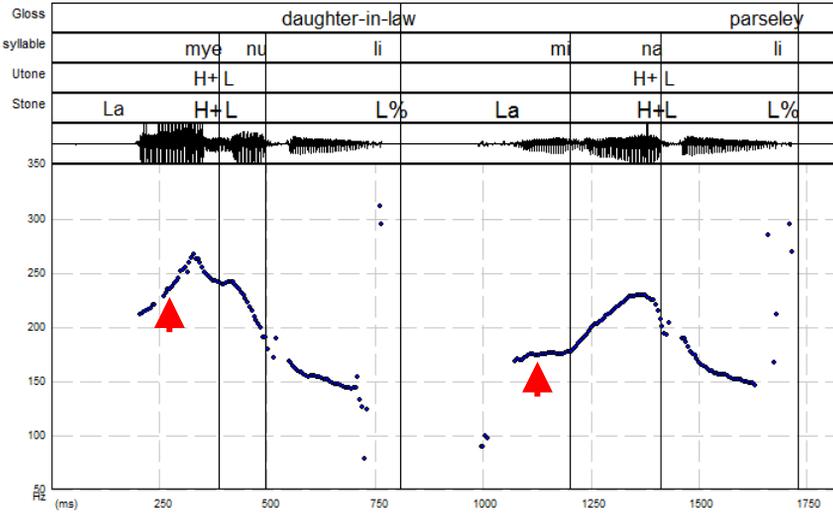
Di-syllabic words are more interesting in that they have four types of underlying pitch accent but seem to have only three types of surface tonal contours. The contours illustrated in (8) are the only tonal contours that exist for di-syllabic words in their isolated forms. However, when a toneless particle is attached as in (9), the di-syllabic word class exhibits four tonal patterns that are exactly the same as those of the tri-syllabic words in (3).

(8) Three Surface Tonal Patterns of Di-syllabic Words
     a. H L   b. H H   c. L H   d. L H
        a tul 'son'   *e mi* 'mom'   *na mwu* 'tree'   *im kum* 'king'

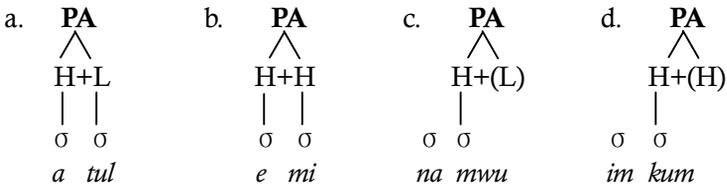(9) Four Surface Tonal Patterns of Di-syllabic Words with a Particle
     a. H L L   b. H H L   c. L H L   d. L H H
        a tul-i   *e mi-ka*   *namwu-ka*   *imkum–i*
        'son-Nom'   'mom-Nom'   'tree-Nom'   'king-Nom'

We claim that di-syllabic words are underlyingly assigned a pitch accent in the same way as tri-syllabic words. The pitch accent representation of di-syllabic words in our model is shown in (10a-d). However, when the second tone of a pitch accent cannot find a docking site (i.e., L in (10c) and the second H in (10d)), the tone that is not docked to a syllable is deleted, and the boundary tone is realized at the end of the phrase as shown in (10c', d'). That is, in our model, two lexical tones cannot be docked to the same syllable, but a lexical tone and a boundary tone can. In other words, lexical tones have to be fully
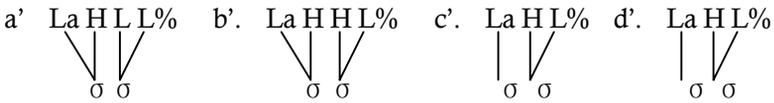
realized on one syllable, but the post-lexical tones (i.e., boundary tones) can be partially realized (i.e., undershot) by merging with a lexically specified tone (see (7a)). This also explains why an AP in our model can have a single tone pitch accent on the surface when the AP has fewer than three syllables. When a toneless particle is added to a di-syllabic word, both pitch accent tones of the di-syllabic word are fully realized as in (10g, h), however, revealing the underlying tonal contrasts.

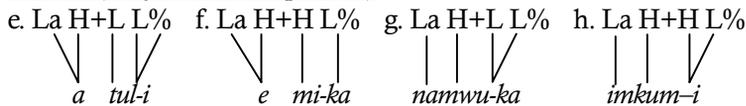(10)   Underlying and Surface Tonal Patterns of Di-syllabic Words

Underlying (di-syllabic word):

a.   **PA**   b.   **PA**   c.   **PA**   d.   **PA**
$\wedge$ $\wedge$ $\wedge$ $\wedge$
H+L   H+H   H+(L)   H+(H)
| | | | | |
σ σ   σ σ   σ σ   σ σ
a   tul   *e   mi*   *na mwu*   *im kum*

Surface (di-syllabic word):

a' La H L L%   b'. La H H L%   c'. La H L%   d'. La H L%
$\searrow$ $\searrow$ $\diagup$ $\searrow$ $\searrow$ $\diagup$ $\searrow$ $\diagup$ $\searrow$ $\diagup$
σ σ   σ σ   σ σ   σ σ

Surface (di-syllabic word-particle):

e. La H+L L%   f. La H+H L%   g. La H+L L%   h. La H+H L%
a   tul-i   *e   mi-ka*   *namwu-ka*   *imkum–i*

3. AP Formation from Multi-prosodic Words

As mentioned earlier, an AP can include more than one Prosodic Word but can have only one pitch accent. Thus, at an AP level, some Prosodic Words become accentless. In other words, an AP is the domain of post-lexical pitch accent. (11) defines an AP formation rule when it contains multiple prosodic words.

(11)   Multi-word-AP Formation
When there are multiple pitch-accented prosodic words, PW1, PW2, … PWn, and they form one AP, the first pitch accent where both of the lexical tones have a docking site is maintained and all other pitch accents are deleted.

This is different from the Tone Interaction rule proposed by Kenstowicz and

Sohn (1997). They assume that every word preserves its lexical pitch accent, and explain different heights of f0 by upstep and downstep. Their Tone Interaction rule is shown in (12).

(12)   Tone Interaction (Kenstowicz & Sohn 1997)
       The tone of a word-final syllable determines the upstep or downstep of the following words: if the first word ends in H, it upsteps the second word; and if the first word ends in L, it downsteps the second word.

Let us analyze the following data based on the above generalizations. (13) shows a pair of phrases in which two Prosodic Words form one phrase. The tonal representation following Kenstowicz and Sohn shows downstep (!H) after L in (a) and upstep (^H) after H in (b). (14) shows a pitch track of these two phrases.

(13)   Tonal Representation of Each Word and the Phrase by Kenstowicz and Sohn

   a. W1   H   L   + W2   H   L
            mi   kwuk 'American'   *kam   dok* 'director'

        →   H   L   !H   L
            mi   kwuk   kam   tok

   b. W3   L   H   +   W4   H   L
            nong kwu 'basketball'   *kam dok* 'director'

        →   L   H   ^H   L
            nong kwu kam   tok

(14)   Example Pitch Track of the Phrases in (13a) and (13b)
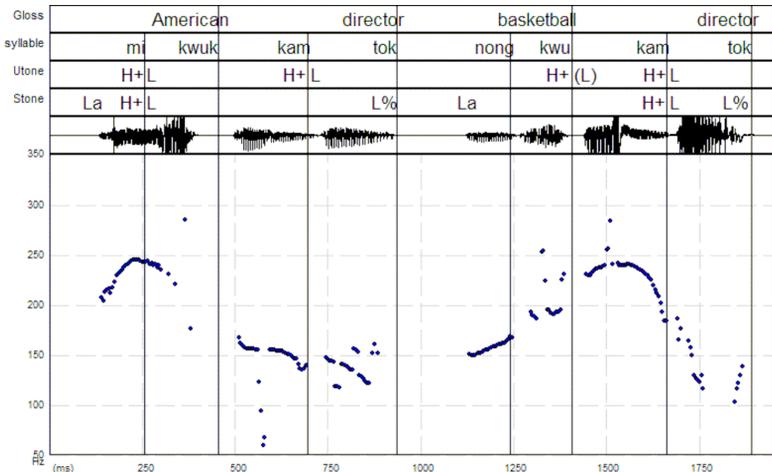
The pitch track in (14) shows that in the first phrase, *mikwuk kamdok,* f0 reaches its peak on the first syllable, *mi-*, and drops immediately after that and stays low until the end. The pitch track of the second phrase, *nongkwu kamdok*, shows that f0 rises from the first syllable until the third syllable, *kam-*, and drops to low at the end. According to our proposal, the realization of the surface tone pattern is straightforward. For (13a), the first pitch accent, H_1+L, that is, the pitch accent of W1, is docked on each syllable of the word, thus becoming the pitch accent of the whole AP and the following pitch accent is deleted, resulting in the surface tonal pattern shown in (14). For (13b), the first pitch accent, H_2+L, cannot be fully realized because the first H tone is linked to the second syllable of the word, *kwu*, resulting in the following L tone being "free" (i.e., no syllable to dock). Therefore, the pitch accent of the second Prosodic Word, *kamdok* (H_1+L), becomes the pitch accent of the whole AP, resulting in the surface tonal pattern shown in (14). The surface tonal representations of our analysis are shown in (15). (15b) also shows the underlying tonal representation of the first word, *nongkwu* (H_2+L).
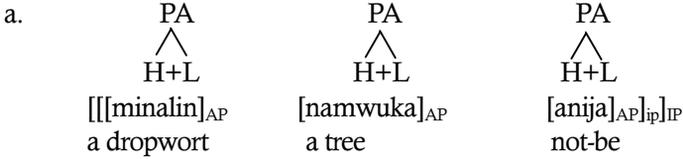
(15)   Tonal Representation of the AP in (13a) and (13b)

a.

$$
\begin{array}{ccc}
 & \mathbf{PA} & \\
 & \wedge & \\
\text{La} & \text{H + L} & \text{L\%} \\
 & |\quad| & \\
\end{array}
$$

[[[mi kwuk ~pw~] [kam dok~pw~] ~AP~]~IP~]

b.

$$
\begin{array}{ccccc}
 & & \mathbf{PA} & & \mathbf{PA} \\
 & & \wedge & & \wedge \\
\text{La} & & \text{H + L} & \text{L\%} & \text{H + L} \\
 & & |\quad| & & | \\
\end{array}
$$

[[[nong kwu ~pw~] [kam dok ~pw~] ~AP~]~IP~]   (UR: nong kwu   )
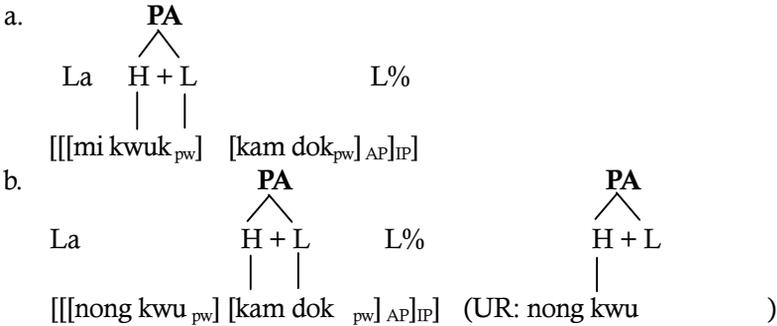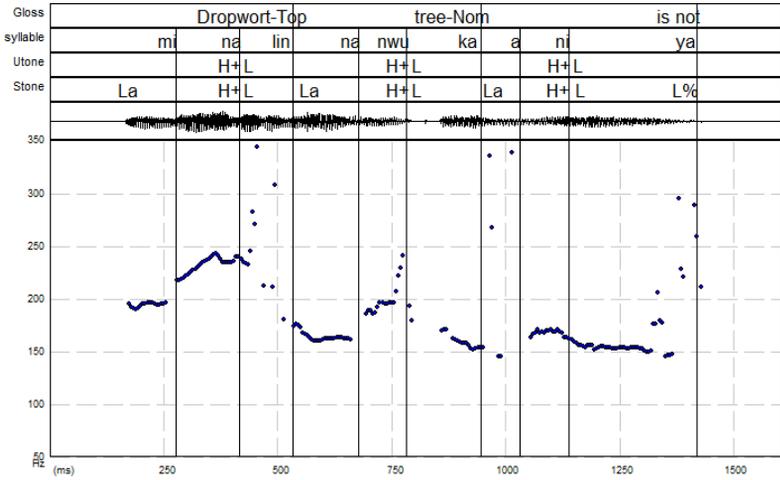
At the AP level, the left edge is assigned a L boundary tone (La). Since the whole phrase is one AP, there is only one La tone, realized over the AP-initial syllable, *mi-* in (15a) and *nong-* in (15b). As shown in (15b), the second syllable *-kwu*, is tonally unspecified but gets its surface tone by an interpolation between the La boundary tone realized on the first syllable and the H pitch accent tone on the 3rd syllable of the AP, *kam-*. Therefore, in this system, syllables can bear a tone either by the lexical specification of pitch accent or by the boundary tone. The tonally unspecified syllables (i.e., unaccented syllables in the accented words or syllables in the postlexically unaccented words) do not bear any tone, i.e., there is no need to insert a default tone postlexically. At the IP level, the right edge is assigned a L boundary tone (L%), and it is realized on the phrase-final syllable.

Since the f0 over the third syllable in (15b) is higher than that of the second
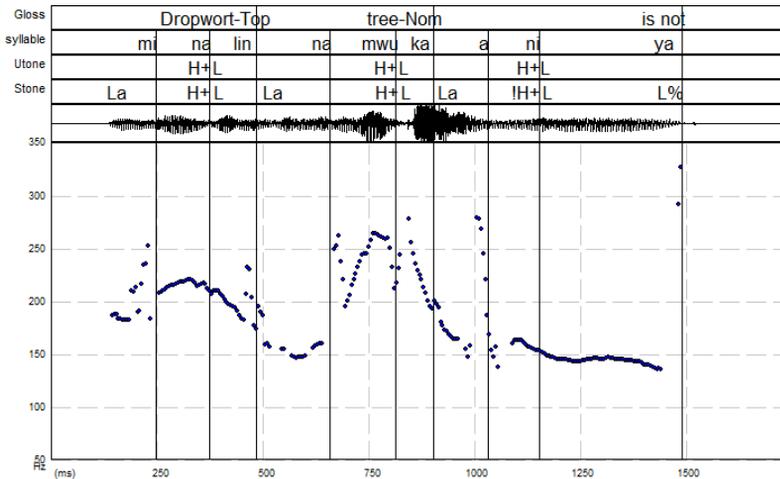
syllable, one can say the H on the second syllable upstepped the following H on the third syllable (i.e., ^H), supporting the analysis by Kenstowicz and Sohn (1997). However, when the first word of an AP has H+H pitch accent, it does not seem to upstep the H tone of the following word (See (16)). Instead, the correct surface tonal pattern is categorized as [HHLL], supporting our analysis. The tonal representation of AP [*chwukkwu kamtok*] in our model is shown in (17).

(16) Tonal Representation of Each Word and the Phrase
     a. W1: H   H W2: H   L → * H   H ^H L
        chwuk kwu   *kam tok*   *chwuk kwu kam tok*
                                          correct surface pattern: [H H L L]

(17) Tonal Representation of (16) in Our Model
$$
\begin{array}{c}
\text{PA} \\
\wedge \\
\end{array}
$$
  La   H+H   L%
  [[[chwuk kwu$_{pw}$] [kam tok$_{pw}$]$_{AP}$]$_{IP}$]

So far, we have shown that SKK has two prosodic domains for pitch accent. One is a Prosodic Word for the lexical pitch accent assignment, and the other is an Accentual Phrase for the post-lexical pitch accent assignment. Now we will investigate which of the two prosodic domains matches the domain of focus in SKK.

4. Focus-to-Prominence in South Kyungsang Korean

Focus prosody of Standard Korean proposed by S-A Jun (2006, 2007) and that of North Kyungsang Korean (NKK) proposed by Kenstowicz and Sohn (1997) and J Jun et al. (2006) are very similar despite the differences in the two prosodic systems. Their common proposal is summarized in (18).

(18) Focus Prosody in Standard Korean and North Kyungsang Korean
     a. Pitch raising of a focused word
     b. Beginning of a new Intermediate Phrase (ip) at the beginning of a
         focused word
     c. Suppression of the pitch range in the post-focus words

Their observation appears to hold for SKK focus sentences. An example pitch track of a three-word sentence, *minarlin namuka anija* 'Dropwort is not a tree', is shown in (19). (b) is the sentence produced in a neutral condition and (c) is when the second word, *namuka* 'a tree-Nom', is narrowly focused.

(19) Tonal Representation and Pitch Track of a Three-Word Sentence, *minarin namuka anija* 'Dropwort is not a tree'.

a.

PA	PA	PA
∧	∧	∧
H+L	H+L	H+L
[[[minalin]$_{AP}$	[namwuka]$_{AP}$	[anija]$_{AP}$]$_{ip}$]$_{IP}$
a dropwort	a tree	not-be

b. Neutral condition: An example pitch track of the sentence in (a)

c. Focus condition: an example pitch track of the sentence in (a) with narrow focus on *namuka* 'a tree' 'Dropwort is not A TREE'

As shown in (19c), the focused word starts a new ip (intermediate phrase) with expanded pitch range on the focused word and reduced pitch range on the

following word.

However, since SKK has different word-level prosody than other dialects of Korean and has two domains of pitch accent--lexical and postlexical, in this section, we will investigate how focus domain interacts with prosodic domain and whether the insertion of a new ip boundary before a focused word is an independent prosodic effect of focus.

4.1. Focus Domain vs. Accent Domain

It is well known that in English and other Germanic languages, the domain of semantic focus is not always the same as the prosodic domain of focus, i.e., accent domain. The domain of semantic focus can be larger than the accent domain (Cinque 1993, Zubizarreta 1998, among others) as shown in (20-21), or can be smaller than the accent domain, as shown in (22). In (20) and (22), the accent domain, i.e., the word receiving prominence, is in capital letters and the semantic domain is marked by "[$_F$]".

(20)   Semantic Focus Domain > Accent Domain
         a. Q: What did John do?
              A: [John [$_F$ ate [the PIE]]]
         b. Q: What happened?
              A: [$_F$ John [ate [the PIE]]]   Zubizarreta 1998

(21)   Right-headedness in broad focus: Most deeply embedded head gets primary stress.

(22)   Semantic Focus Domain < Accent Domain
         a. We need to [$_F$ IM]PORT, not [$_F$ EX]PORT.
         b. Oh, I've only got [$_F$ THIR]TEEN, not [$_F$ FOUR]TEEN.

However, the mapping between the semantic focus domain and the accent domain is often more straightforward when a single word is narrowly focused. In English, when a word is narrowly focused, the word is produced prominently by making the stressed syllable of the word a nuclear pitch accented syllable, i.e., making the syllable most prominent in the phrase and deaccenting all following words in the phrase. A similar strategy is found in Standard (Seoul) Korean. The focused word becomes prominent by expanding the pitch range of the word and substantially reducing the pitch range of all following words. However, the mapping is not always direct when the focus realization is constrained by word order (e.g., Basque (Elordieta 2006), Georgian (Skopeteas, Fery & Asatiani 2008; Vicenik & S-A Jun, to appear)) or tonal interaction (e.g., North Kyungsang Korean (J Jun et al. 2006), Basque (Elordieta 2006)). In this

section, we will show a few examples of SKK where the domain of accent does not match the domain of semantic focus.

In the previous section, we have argued that every Prosodic Word (PW) in SKK has a lexical pitch accent. However, at the level of AP, only one of them survives as the pitch accent of the whole AP. Then, the question is where the prosodic effect of focus would appear when more than one PW combines to form one AP but semantic focus is assigned to the PW which lost its pitch accent at the AP level. Since SKK has two domains of pitch accent (a PW for the lexical pitch accent and an AP for the post-lexical pitch accent), one of them could be the prosodic domain of focus. Here we will show that the prosodic domain of focus is an AP and confirm that focus assignment is sensitive to the prosodic structure of the phrase.
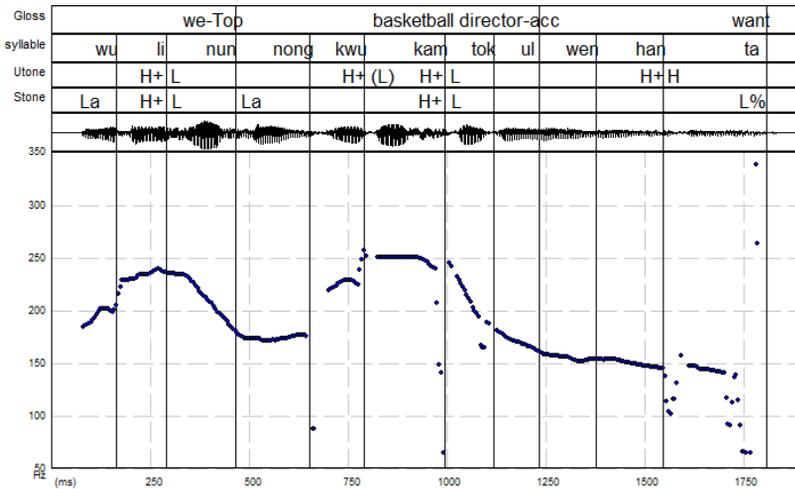
(23) shows the tonal representation and a pitch track of a SOV sentence, *wulinun nongkwu kamtokul wenhanta* 'We want a basketball director', produced in a neutral condition, and (24) shows the tonal representation (underlying and surface) and a pitch track of the utterance with contrastive (corrective) focus on *nongkwu* 'basketball'.

(23) Neutral: 'We want a basketball director.'
    a. Surface tonal representation of the sentence

       La   H+L   La   H+L   L%
      [[[wu li nun_{PW}]_{AP}]_{ip}] [[[nong kwu_{PW1}] [kamtok-ul _{PW2}] [wen han ta_{PW3}]_{AP}]_{ip}]_{IP}]
        we-Top   basketball   director-Acc   want.
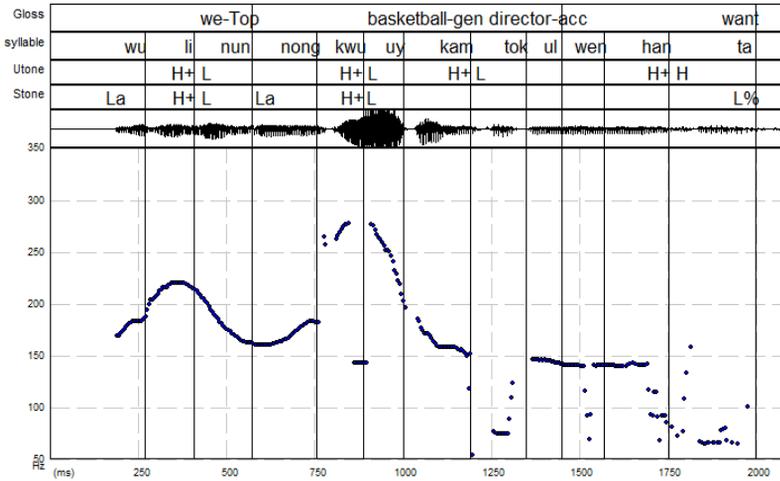
    b. Example pitch track of the sentence in (a)

Gloss		we-Top			basketball director-acc						want
syllable	wu	li	nun	nong	kwu	kam	tok	ul	wen	han	ta
Utone		H+	L			H+	(L)	H+	L		H+	H	
Stone	La	H+	L	La			H+	L				L%

(24) Focus on 'basketball': 'We want a **basketball** director. (not a **baseball**
      director)'

   a. Underlying form of the phrase, ***nongkwu** kamtok-ul* 'basketball
      director-Acc'

      La   H+(L)   H+L   H+H
      [[**nongkwu** PW]   [kamtok-ul PW]   [wen han ta PW] AP]

   b. Surface representation of the sentence with focus on 'basketball':

      La   H+L   La   **H + L**
      [[[wu li nun PW]AP] ip]   [[[**nongkwu** PW1] [KAM TOK-UL PW2]
      we-Top   **basketball**   DIRECTOR-ACC
                                      L%
      [wen-han-ta PW3] AP] ip] IP].
      want.

   c. Example pitch track of the sentence in (b)

In the neutral sentence in (23), there appear two ips with each ip having one
AP: (wulinun)(nongkwu kamtokul wenhanta). The pitch peak (the realization
of pitch accent) of the second AP is higher than that of the first AP, against the
declination slope, suggesting the existence of a prosodic boundary higher than
an AP, i.e., ip. This means that an ip is the domain of pitch declination or
downstep in SKK. In the second ip, the peak is on the first syllable of PW2,
kam.

   In example (24), the word *nongkwu* 'basketball', which does not bear a pitch
accent in the AP level, is narrowly focused (i.e., corrective focus), thus render-
ing the word as the domain of semantic focus. However, as can be seen in the
pitch track, f0 peak is not on the focused word, *nongkwu*, but is on the follow-
ing word *kamtok* (H_1+L) 'director', with the peak, much higher than that in

(23). This appears to be against the straightforward application of focus prominence theory because what is prominent via pitch range expansion is not the focused word itself but the (post-lexically) pitch accented word within the whole AP. One noticeable thing is that only the f0 of the pitch-accented syllable is raised but not other syllables in the PW or AP. This provides evidence against the tone insertion argument and supports the interpolation argument. If every syllable is specified with H or L tones by an insertion rule, they should maintain the original tonal shape under focus while raising the f0 of H toned syllables. But as can be seen in (24), only the pitch-accented syllables, that is, tonally specified ones at the AP level, show pitch range expansion. A simple description of this process is given in (25):

   (25) [Semantically Focused Word (SFW) + Pitch Accent bearing Word (PAW)]$_{AP}$ → [SFW + ***PAW***]$_{AP}$
        (***Italicized Bold lettering*** indicates the appearance of focus prosodic effect)

That is, if the AP-initial Prosodic Word is focused, i.e., SFW, but the pitch accent of the AP is from the second Prosodic Word (i.e., PAW), the prosodic effect of focus is not realized on SFW but on PAW. This is so because the second tone of SFW's pitch accent (i.e., L of H+L) does not have a docking site, causing the word to be accentless at the AP level. This implies the SFW's pitch accent could survive as the pitch accent of the whole AP if the second tone has a docking site by adding one more syllable to the SFW. This is exactly what happens as shown in (26), supporting our claims concerning lexical pitch accent types and the AP-based focus prosody. (26) illustrates the tonal representation and pitch track of a sentence where the SFW matches the PAW with the addition of a toneless particle, *-ey* (possessive marker), to the SFW.

   (26) Focus on 'basketball' with a Particle: 'We want a director **of basketball**. (not of **baseball**)'
      a. Surface representation of the sentence with focus on 'basketball':
          La H+L   La   **H+L**
          [[[wu li nun $_{PW}$]$_{AP}$]$_{ip}$ [[[**NONG KWU-EY** $_{PW1}$] [kamtok-ul $_{PW2}$]
            we-Top   **BASKETBALL-OF**-   director-Acc
                                L%
          [wen han ta $_{PW3}$]$_{AP}$]$_{ip}$]$_{IP}$.
           want.

b. Example pitch track of the sentence in (a)

Gloss		we-Top				basketball-gen director-acc							want
syllable	wu	li	nun	nong	kwu	uy	kam	tok	ul	wen	han		ta
Utone		H+	L			H+	L		H+	L		H+	H
Stone	La	H+	L	La		H+	L						L%

The phenomenon of mismatch between the domain of accent and the domain of semantic focus is not confined to a compound word, as one might assume based on the examples discussed so far. Focus prominence is realized on the pitch accent of the whole AP whether the multi-word AP is a compound word or a syntactic phrase. The following example illustrates focus prominence of AP when the AP includes an object argument and a verbal predicate.

(27) shows the tonal representation (underlying) of each word in a SOV sentence, *emwuika namwul meknunta* 'Mother eats salad'.

(27)   Pitch Accent Representation of Each Prosodic Word

<div align="center">

PA   PA   PA

∧   ∧   ∧

H+L   H(+L)   H+L

e mwu i-ka   *na mwul*   *mek nun ta*

'mother-Nom'   'salad'   'eat'

</div>

When the sentence is produced naturally, the object PW and the verb PW form a single AP. Since the second tone of the H+L pitch accent of the object PW does not have a docking site, following the AP generalization rule (11), the pitch accent of the verb PW becomes the pitch accent of the AP. Accordingly, the prosodic focal effect appears on the verb even when the semantic focus is on the object argument. (28a) shows the surface representation of the sentence with focus on the object and (28b) shows an example pitch track of this sentence.

(28) Focus on 'salad': 'Mother eats **salad**. (not **bread**)'
a. Surface representation of the sentence:

La   H+L   La   H + L   L%
[[[e mwu i-ka ꜱᴡ]ᴀᴘ] ᵢₚ]   [[[**na mwul** ᴘᵂ¹] [MEK NUN TA ᴘᵂ²]ᴀᴘ]ᵢₚ] ɪᴘ
      mother-Nom   **salad**   EAT

b. Example pitch track of the sentence in (a)
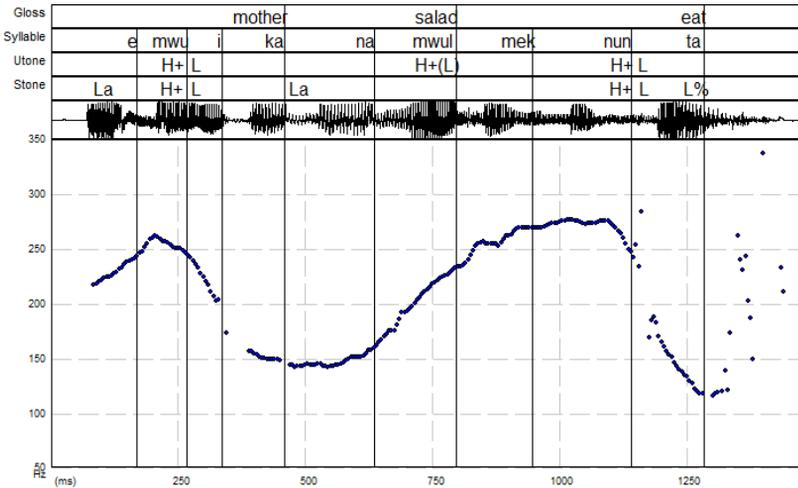
However, as in (26), when a particle is added to the object PW, the lexical pitch accent of the object is fully realized. When the object PW is semantically focused, the object PW and the following verb PW form one AP and the pitch accent of the object PW becomes the pitch accent of the whole AP, thus SFW matching PAW. We can see the surface tonal representation of the sentence and an example pitch track in (29).

(29) Focus on 'salad' with a Particle: 'Mother eats **salad**. (not **bread**)'
a. Surface representation of the sentence:

La   H + L   La   **H + L**   L%
[[[[e mwu i-ka ꜱᴡ]ᴀᴘ]ᵢₚ [[[**NA MWUL-UL** ᴘᵂ¹] [mek nun ta ᴘᵂ²]ᴀᴘ]ᵢₚ] ɪᴘ
      mother-Nom   **SALAD-ACC**   eat
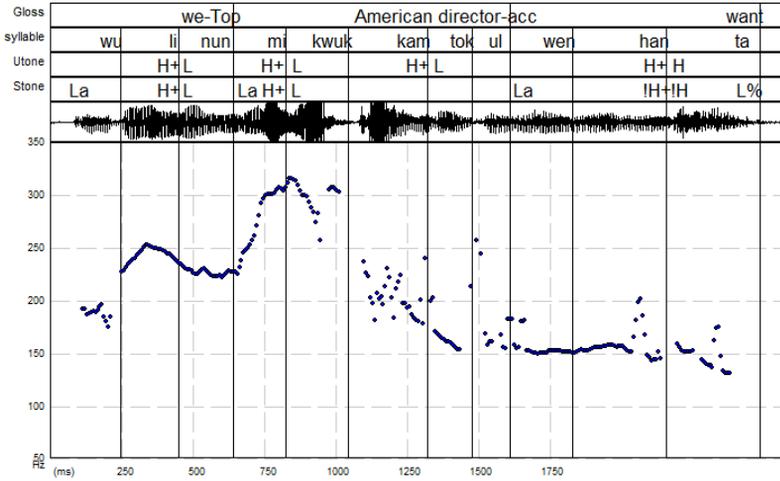
b. Example pitch track of the sentence in (a)
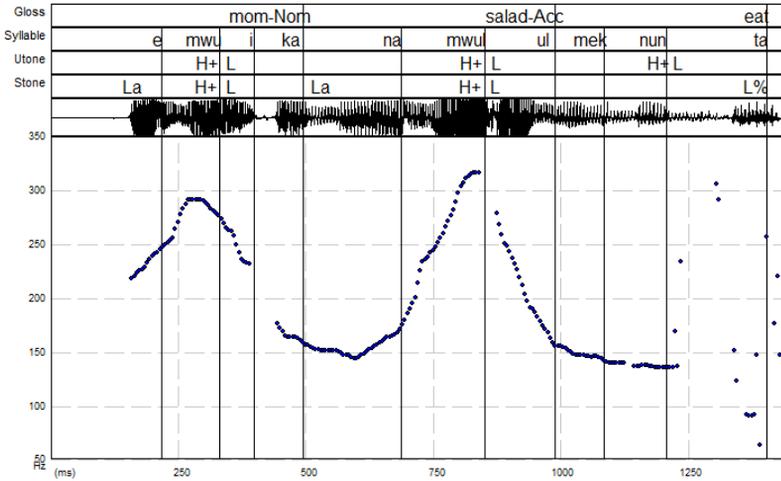
Therefore, the mismatch between the domain of accent and the domain of focus is not limited to a compound word. In sum, the prosodic domain of focus, or the realization of focus prominence, in SKK is an AP regardless of the morpho-syntactic composition of the AP.

4.2. The Independence of Intermediate Phrase Boundary Insertion

In the previous section, we have shown that when the PWA is the second word of an AP, narrowly focusing the AP-initial word does not change the prominence relation within an AP. Focus prosody targets the pitch accent of the PWA in the AP to which a focused constituent belongs, not the focused word itself. In this section, we will investigate a slightly different case in which the PWA is the AP-initial word and the SFW is the second word in the AP. An example is in (30), 'American director-Acc', produced in a neutral condition. The AP-initial word, *mikwuk* 'American', has H+L pitch accent word-initially, i.e., H_1+L, so, according to the AP formation rule, both pitch accent tones can be realized at the postlexical level. That is, the word becomes the PAW of the first AP, *mikwuk kamtokul*, and the pitch accent of the second PW is deleted. As in (23), there is an ip boundary between the subject and the predicate. The predicate forms the second ip which has two APs, (*mikwuk kamtokul*) and (*wenhanta*). Here, the second AP is substantially reduced.[4]

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[4] The pitch contour of the second AP (*wenhanta* 'to want') is not clearly visible due to the creaky voice quality. A better pitch contour of the last AP (*wenhanta*) is shown in (31b). Whether the verb is produced as a separate AP or not is optional and would not affect the main claim of this section, i.e., an ip boundary is inserted before a focused phrase.
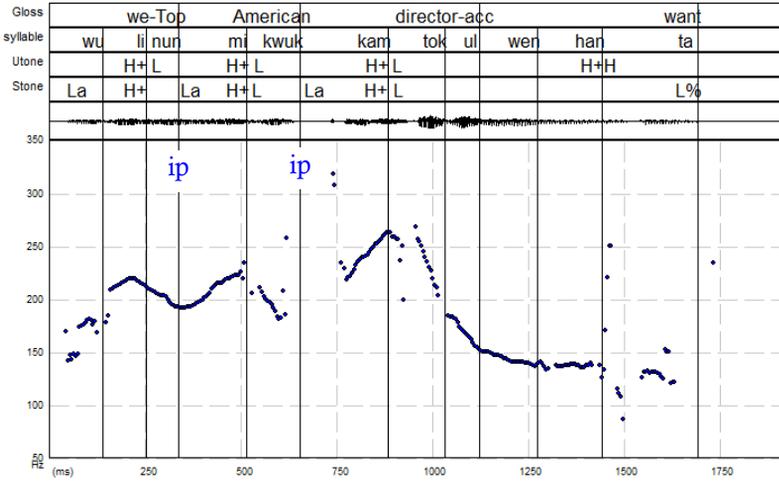
(30)   Neutral: 'We want an American director.'

a. La   H+L   La   H+L   La   H+H   L%

[[[wu linun $_{PW}$]$_{AP}$]$_{ip}$] [[[mikwuk $_{PW1}$] [kamtok-ul $_{PW2}$] [wen han-ta $_{PW}$]$_{AP}$]$_{ip}$] $_{IP}$

we-Top   American   director-Acc   want

b. Example pitch track of the sentence in (a)

If the AP-initial word, *mikwuk* 'American', in (30) becomes contrastively focused, i.e., becomes a SFW, that word would become a PAW of the AP because both pitch accent tones of the word would be fully realized. This is illustrated in (31). The pitch pattern of this sentence is almost the same as that of the neutral sentence in (30). The only difference is that the contrastively focused one has a sharper and higher peak on the AP-initial word.

(31)   Focus on 'America': 'We want an **American** director. (not a **Japanese** one)'

a. La   H+L   La   **H+L**   L%

[[[wulinun $_{PW}$]$_{AP}$]$_{ip}$ [[[**MIKWUK** $_{PW1}$] [kamtok-ul $_{PW2}$] [wenhanta]$_{AP}$]$_{ip}$]$_{IP}$

we-Top   **AMERICAN**   director-Acc   want

b. Example pitch track of the sentence in (a)

Finally, we will examine a case where an AP-initial word is PAW and the second word in the AP is SFW. Considering what has been discussed so far, we would expect that the f0 peak of the PAW (e.g., the first Prosodic Word, *mikwuk* in (30)) would become super-high and the following prosodic words including SFW will show low pitch. However, contra to our prediction, the prosodic effect occurs in the SFW which does not bear a pitch accent in its neutral form. The surface tonal representation and a pitch track of the focus sentence are shown in (32).

(32) Focus on 'director': 'We want an American **director**. (not a **player**)'
   a. La   H+L   La   H+L   La   **H + L**   L%
       [[[wu-li-nun ₚW]ₐₚ]ᵢₚ] [[[mi-kwuk ₚW₁]ₐₚ]ᵢₚ] [[[**KAMTOK-UL** ₚW₂]
              We-Top   American   **DIRECTOR-ACC**

       wenhan-ta ₚW]ₐₚ]ᵢₚ] ᵢₚ
       want

b. Example pitch track of the sentence in (a)

Gloss		we-Top		American		director-acc					want	
syllable	wu	li	nun	mi	kwuk	kam	tok	ul	wen	han	ta	
Utone		H+	L	H+	L	H+	L			H+H		
Stone	La	H+		La	H+L	La	H+ L				L%	

ip   ip

(pitch track with y-axis in Hz: 350, 300, 250, 200, 150, 100, 50; x-axis in ms: 250, 500, 750, 1000, 1250, 1500, 1750)

The pitch track in (32b) shows that the utterance has three ips: the subject *wulinun* 'we-Top', the second PW, *mikwuk* 'American', and the rest. The predicate which formed one ip in the neutral condition is divided into two ips. That is, a new ip is inserted before the focused word, *kamtokul* 'director-Acc'. In the neutral condition (30), the word 'director' didn't even maintain its own pitch accent because it formed one AP together with the preceding prosodic word. This suggests that when a word is focused, it is forced to begin a new ip, and assuming the Strict Layer Hypothesis (Selkirk 1986), the new ip begins a new AP detached from the preceding PW. This is expected because an AP is a prosodic unit lower than an ip, and the boundary of a higher prosodic unit matches the boundary of the lower prosodic unit. Now, in the newly formed focused ip and AP, the initial word that provides the pitch accent of the AP, i.e., PAW, is the SFW. It should also be noted that an ip resets pitch range, with its peak the same or higher than the peak of the preceding AP/ip. But a focused ip shows even more expanded pitch range than the default ip. The effect of the initiation of a new ip due to focus is well revealed in (32b) when it is compared with the neutral sentence (30b) or with the sentence that has focus on the predicate-initial word, *mikwuk* 'America', (31b).

In (24), the effect of ip insertion does not affect the mapping of SFW to PAW because the focused word (SFW) is already at the beginning of an ip/AP in the neutral condition. However, in (32), inserting an ip boundary before the focused word, which was in the middle of an AP in the neutral condition (30), changed the lower prosodic structure making the word eligible for focus realization. The procedure can be summarized as in (33).

(33)   [PAW + SFW $_{AP}$] → [[PAW] $_{AP}$] $_{ip}$ + [[***SFW*** $_{AP}$]…] $_{ip}$
       (***Italicized Bold lettering*** indicates the appearance of focus prosodic effect.)

We have defined an ip as the domain of downstep and pitch declination. Thus, when a pitch peak does not follow a phonetic downtrend, a new ip boundary is assumed to be present before the peak. In the analysis of Standard Korean, a question may be raised regarding the insertion of ip as one of the prosodic effects of focus. That is, "focus begins a new ip" can be just another description of the phenomenon of pitch raising of a focused constituent since, if pitch is raised, it naturally interrupts a phonetic downtrend. However, the focus examples in SKK provide a firm piece of evidence that the insertion of a new ip boundary is an independent prosodic effect of focus.

5. Conclusion

In this paper, we introduced a prosodic system of South Kyungsang Korean (SKK) and its interaction with focus. The prosodic system proposed here explains not only the lexical pitch accent assignment and the formation of low level prosodic domains but also the intonation pattern of a whole sentence by adopting the framework of Autosegmental-Metrical phonology of intonation. A further strength of our analysis is that it can explain puzzling examples that appear in some focus data. Without understanding the prosodic system of SKK, it would be hard to explain the cases where a narrowly focused word does not bear any prosodic prominence, but instead, its neighboring word does. In general, semantic focus is mapped onto a prosodic prominence (FTA theory) in languages which utilize a prosodic strategy, but the mapping is not always direct, and to understand any non-direct mapping, the target language's prosodic system should be considered first.

Further study is needed to investigate the domain of focus effect illustrated in the current paper when the syntactic structure is more complicated. Furthermore, a detailed quantitative analysis of production data from naive speakers should be performed to confirm the prosodic structure and focus prosody discussed in the paper.

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