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Differences in prosodic phrasing in marking syntax vs. focus: Data from Yanbian Korean

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Abstract: In studying the effect of syntax and focus on prosodic phrasing, the main issue of investigation has been to explain and predict the location of a prosodic boundary, and not much attention has been given to the nature of prosodic phrasing. In this paper, we offer evidence from intonation patterns of utterances that prosodic phrasing can be formed differently phonologically and phonetically due to its function of marking syntactic structure vs. focus (prominence) in Yanbian Korean, a lexical pitch accent dialect of Korean spoken in the northeastern part of China, just above North Korea. We show that the location of a H tone in syntax-marking Accentual Phrase (AP) is determined by the type of syntactic head, noun or verb (a VP is marked by an AP-initial H while an NP is marked by an AP-final H), while prominence-marking accentual phrasing is cued by AP-initial H. The difference in prosodic phrasing due to its dual function in Yanbian Korean is compared with that of Seoul Korean, and a prediction is made on the possibility of finding such difference in other languages based on the prosodic typology proposed in (Jun, Sun-Ah. 2014b. Prosodic typology: by prominence type, word prosody, and macro-rhythm. In Sun-Ah Jun (ed.), *Prosodic Typology II: The Phonology of Intonation and Phrasing*. 520–539. Oxford: Oxford University Press).

Keywords: Yanbian Korean, lexical pitch accent, prosodic phrasing, focus, syntax-marking, prominence-marking, accentual phrase

1 Introduction

Prosodic phrasing is a grouping of words, which can refer to prosodic units of various sizes. These units typically include a Phonological Phrase (also called a Minor Phrase or an Accentual Phrase), an Intermediate Phrase, and an Intonational Phrase (also called a Major Phrase). Prosodic phonologists (e.g.

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Selkirk 1986, 2000, 2011; Nespor and Vogel 1986/2007; Hayes 1989; Truckenbrodt 1999) and intonational phonologists (e.g. Pierrehumbert 1980; Beckman and Pierrehumbert 1986; Ladd 1996/2008; Grice 1995; Kubozono 1993; Jun 1993/1996; Grice, Arvaniti, and Ladd 2000) have assumed that these prosodic units are hierarchically organized so that a higher prosodic unit can include one or more lower prosodic units. These prosodic units can form the domain of segmental phonological rules (e.g. Selkirk 1986; Nespor and Vogel 1986/2007; Hayes and Lahiri 1990; Jun 1993, 1998; Baltazani 2006) and the domain of phonetic strengthening or weakening of segment realizations (e.g. Fougeron and Keating 1997; Keating et al. 2003; Cho and Keating 2001; Tabain 2003; Kim and Cho 2013; Jun 1993). They are also often marked by intonation (e.g. Beckman and Pierrehumbert 1986; Jun 1993, 1998) and distinguished by different degrees of phrase-final lengthening (e.g. Wightman et al. 1992).

Though languages differ in the number of prosodic units they have and how their prosodic units are phonetically realized and phonologically defined, it is well known that the formation of prosodic units or prosodic phrasing is influenced by syntax and phonological weight across languages. It is also well known across languages that prosodic phrasing is often influenced by information structure, especially focus. For some languages, narrow focus can be cued phonologically by changing the type of pitch accent (e.g. English, Spanish), but for other languages, focus is marked by prosodic phrasing (e.g. Korean, Mongolian) (see Jun 2014a). That is, a focused word can begin a new prosodic unit while deleting prosodic boundaries after focus (e.g. Korean) or a focused word can end a prosodic unit while deleting prosodic boundaries before focus (e.g. Kolkatta Bengali, Chichewa).

In studying the effect of focus on prosodic phrasing, however, the main issue of investigation has been to explain and predict the location of a prosodic boundary, in a way similar to studying how syntactic structure affects the location of a prosodic boundary. That is, not much attention has been given to the nature of prosodic phrasing depending on its function. However, a way to mark prosodic phrasing can differ phonologically and phonetically based on the function of prosodic phrasing, especially when it marks syntactic structure vs. prominence/focus. One such example was shown for the Intermediate Phrase (ip) in Seoul Korean (Jun 2011). In Seoul Korean, an ip, which is smaller than an Intonational Phrase (IP) and larger than an Accentual Phrase (AP), has two major functions, and depending on its function, it is defined differently. An ip that marks the grouping of a syntactic constituent, which I call a 'syntax-marking' ip, has a final boundary tone, H- or L-, aligned with the *right* edge of a syntactic constituent. On the other hand, a prominence-marking ip has no

boundary tone. Instead, the left edge of an ip is aligned with the *left* edge of a prominent word, and the pitch range is reset ip-initially by raising the prominent word's initial H tone.

In this paper, we will show how prosodic phrasing is also defined differently depending on its function, vis-à-vis syntax and prominence, in Yanbian Korean, a lexical pitch accent dialect of Korean spoken in the northeastern part of China, just above North Korea. Specifically, we will show that syntax-marking prosodic phrasing in Yanbian Korean is headed by the rightmost H tone while focus-marking prosodic phrasing is headed by the leftmost H tone. Since Seoul and Yanbian Korean share the same hierarchical structure of intonational phonology, we will briefly introduce the model of intonational phonology of Seoul Korean and the two functions of an ip (Jun 1993, 1998, 2007, 2011; Jun and Cha 2015) (Section 1.1), before introducing the lexical prosody and intonational phonology of Yanbian Korean (Section 2). Section 3 shows how prosodic phrasing changes in Yanbian dialect depending on the type of the lexical head (Noun vs. Verb) of an Accentual Phrase and how it cues syntactic grouping and disambiguation, when an utterance is produced in neutral-focus condition. Section 4 shows how prosodic phrasing in Yanbian dialect changes when a word is narrowly focused. Section 5 discusses the findings from Yanbian Korean prosodic phrasing by referring to prosodic phrasing of Seoul Korean and attempts to predict the possibility of finding Korean-like prosodic phrasing in other languages based on the prosodic typology proposed in Jun (2014b).

1.1 Intonational phonology of Seoul Korean

The intonational phonology of Seoul Korean, proposed in Jun (1993, 1998), was revised in Jun (2006, 2007, 2011) by adding an Intermediate Phrase (ip). A tree diagram illustrating the revised model of intonation-based prosodic structure of Seoul Korean is given in Figure 1. The highest unit, called Intonational Phrase (IP) is marked by a boundary tone (e.g. L%, H%, LH%, HL%, LHL%, HLH%, LHLH%), and can have more than one Intermediate phrase (ip), which is marked by an optional boundary tone, T- (=H- or L-), and can have more than one Accentual Phrase (AP). An AP can have more than one word, and its basic tonal pattern is LHLH or HHLH. When there are more than 3 syllables in an AP, the first two tones mark the left edge of an AP, realized on the first two syllables of an AP, and the last two tones mark the right edge of an AP, realized on the last two syllables of an AP. But when the AP has fewer than

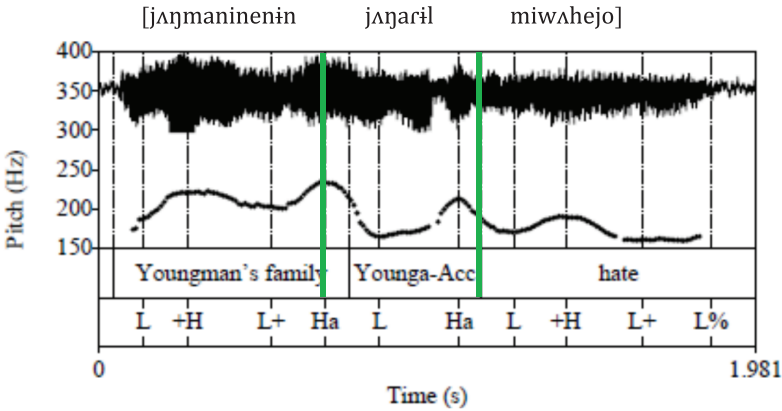


Figure 2: Example pitch track of a sentence, with each word forming one AP. The right edge of each AP is marked by a thick vertical line. (The tone labels, ‘L’, ‘+H’, ‘L+’, and ‘Ha’, follow the K-ToBI convention (Jun 2000)).

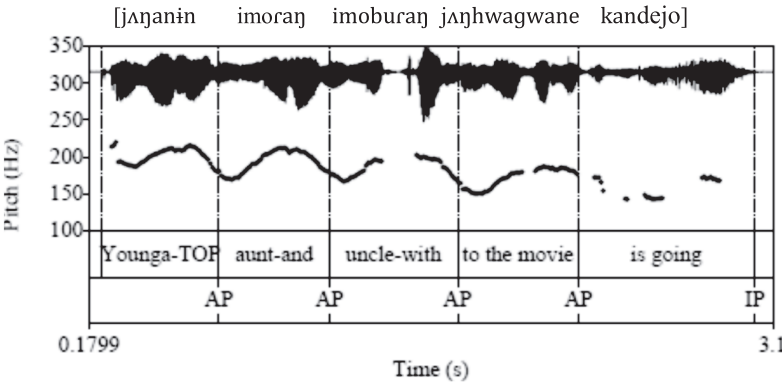


Figure 3: Example pitch track of a five word sentence, produced in a neutral focus condition. Each word forms one AP, with downtrend of AP peaks across an ip.

Younga is going to a movie theater with her aunt and uncle’, produced in a neutral focus condition. Each word forms one AP, with its f0 peak declining across the whole sentence, which forms one ip and one IP.

When the third word ‘with uncle’ is narrowly focused as shown in Figure 4 (‘Younga is going to a movie theater with her aunt and UNCLE.’), the focused word begins a new ip by raising the AP-initial H tone (i.e. ‘+ H’) and phonetically dephrasing the following words. That is, an ip boundary is inserted at the left edge of a focused word, and the pitch range of the post-focus words is

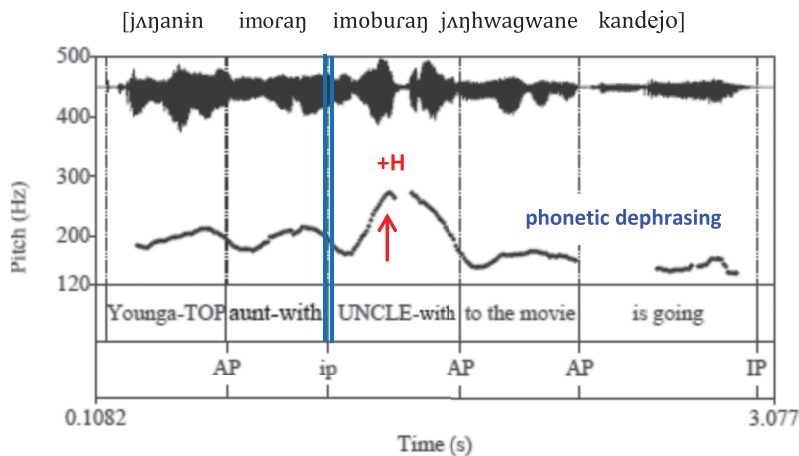


Figure 4: Example pitch track of the same sentence as that in Figure 3, but with the third word being narrowly focused. The focused word begins an ip with a raised +H tone, i.e. pitch reset, followed by phonetic dephrasing. The focused word is lengthened but the final syllable of the preceding ip, i.e. [raŋ] in [imoraŋ], is not lengthened. (An ip boundary is marked by double vertical lines.).

substantially reduced while the AP boundary is still maintained. In this case, the syllable immediately before an ip boundary, [raŋ], which is the final syllable of the preceding ip, is not lengthened.¹

A word can also begin a new ip when it is prominent due to a variety of reasons (e.g. pragmatic, intentional, syntactic, or morpheme-inherent emphatic meaning), without being narrowly focused. In this case, the prominent word shows a pitch range reset, starting an ip, and the preceding ip-final syllable does not show any phrase-final lengthening as was the case before a focus-marking ip. An example is shown in Figure 5. Here, the sentence is the same as that in Figure 3, but is produced by a different speaker in the neutral focus condition. The speaker produced the fourth word with higher pitch range and stronger amplitude than that of the third word, creating a new ip from the fourth word. The f₀ peaks of the first three words of the sentence are declining, suggesting

¹ The final syllable of an ip which is immediately preceding a focus-marking ip can be slightly lengthened if the ip boundary happens to be also the boundary of a syntactic constituent. (See the description about the syntax-marking ip in Figure 6). When the final syllable of the pre-focus ip is not lengthened, it does not carry a boundary tone (H- or L-), either.

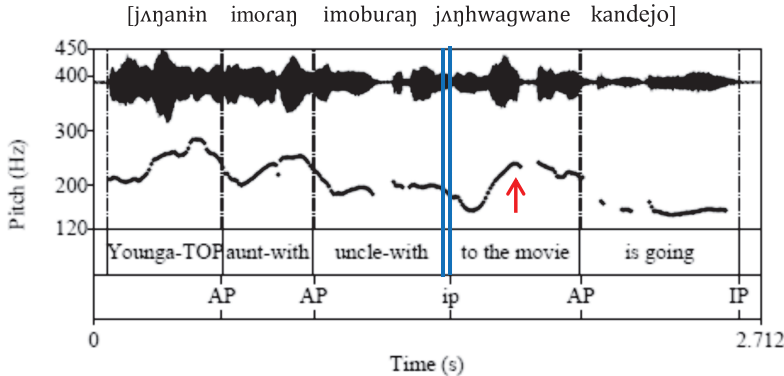


Figure 5: Example pitch track of the same sentence as that in Figure 3, produced in the neutral focus condition by a different speaker. The fourth word ([jaŋhwagwane]) shows pitch reset, beginning a new ip. This word is perceived as more prominent than the same word in Figure 3, and the final syllable of the third word, i.e. the end of ip, is not lengthened.

that the three words form one prosodic unit, but the final syllable of the third word is not lengthened.²

Finally, in addition to marking prominence, an ip often marks a syntactic constituent. In this case, the right edge of an ip boundary is cued by a final boundary tone H- or L- (H- is more common) realized on the ip-final syllable, which is often slightly lengthened.³ Figure 6 illustrates an example of an ip, marking the end of a relative clause (for more data, see Jun 2007). The phrase in Figure 6 is part of a sentence, including an indirect object modified by a relative clause. It means ‘To (my) colleague’s wife who is hospitalized’. The relative clause (‘who is hospitalized’) includes the first two words with each word forming one AP, but the second AP’s final H tone is higher than that of the first AP. This higher H boundary tone is an ip-boundary tone, H-. If the second AP is ip-medial, the AP-final Ha boundary tone would be slightly lower than that of the preceding AP.

In sum, in Seoul Korean, an ip can mark prominence or syntactic grouping, but prominence-marking ip is cued by the left edge of an ip by raising a H tone

² This is a general pattern. For the specific example shown here, the duration of the final syllable [ran] is 199 ms (36% of the duration of the third word, [imoburan], which is 547 ms) in Figure 3, and the duration of the final syllable in Figure 5 is 196 ms (35% of the third word, which is 559 ms), confirming no ip-final lengthening in Figure 5.

³ The degree of ip-final lengthening is much smaller than that of IP-final lengthening. It is closer to an AP-final juncture, so in the earlier model of Korean intonation (Jun 1993), this unit was categorized as an AP.

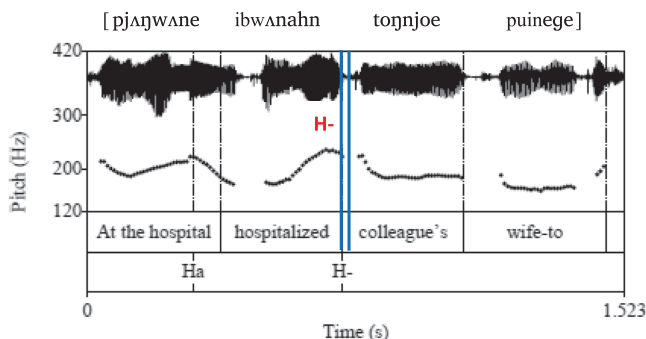


Figure 6: Example pitch track of a phrase ‘To (my) colleague’s wife who is hospitalized’, showing an ip-final H- boundary tone, marking the end of a relative clause (i.e. the end of the second word). The H- boundary tone is higher than the H boundary (Ha) of the preceding AP.

(which is +H, but if the AP doesn’t have +H, Ha) of the ip-initial AP. On the other hand, syntax-marking ip⁴ is cued by the right edge of an ip by a boundary tone and slight lengthening of the ip-final syllable.

2 Lexical and phrasal prosody of Yanbian Korean

Yanbian Korean is spoken in the Yanbian Prefecture in the Jilin Province of Mainland China. The Yanbian area has been Yanbian Korean Autonomous Prefecture since 1955. This area is just north of Hamgyung Province of North Korea, and Yanbian Korean is known to be a variety of Hamgyung dialect (Ramsey 1978; Umeda 1993; (cited in Ito 2008); H. Jun 1998). There are about 2.7 million people in Yanbian as of 2010 and about 38% of them are ethnic Korean (Jung 1995; Kim 2011). The official languages in this area are both Korean and Mandarin. The data for the current work were collected from 12 speakers (9 female and 3 male) in Yanji, the capital city of Yanbian, in 2016–2017. The speakers were in their 20 s and 30 s.

2.1 Lexical prosody of Yanbian Korean

Like the Hamgyung dialect of North Korea and the Kyungsang dialect of South Korea, pitch in Yanbian Korean is a lexical property of a word (Ramsey 1978;

⁴ This does not mean that an ip marks every syntactic constituent. This refers to the function of ip based on the fact that heavy syntactic constituents or sentence-medial clause boundaries in Korean tend to be marked by an ip or IP boundary (Jun 1993, 1998, 2007).

Umeda 1993; Jung 1995; H.Jun 1998; Ito 2008, 2014a, 2014b). Since each lexical item is typically realized with one H tone, Ito (2008, 2014a) categorized Yanbian Korean a lexical pitch accent dialect. According to Ito, a Yanbian word can be lexically accented (marked by a H tone on a certain syllable in a word) or not (no H). Thus, a monosyllabic word can be either H (ex. /kʰi/ ‘height’, /hím/ ‘power’) or L (ex. /mok/ ‘a neck’, /sul/ ‘liquor’), a disyllabic word can be HL, LH, or LL, and a trisyllabic word can be HLL, LHL, LLH, or LLL. Words that are longer than three syllables have various tonal patterns but typically have a H on the final or penultimate syllable of the word.

Ito (2008), citing Park (2001) and Che (2004), reports that the final accent class (e.g. LH, LLH, LLLH) and the unaccented class (e.g. LL, LLL, LLLL) are neutralized as final accent in isolation, represented as L[H], LL[H], LLL[H], respectively,⁵ but are distinguished in inflectional forms by the suffix having an L tone after the final accent class (e.g. LH+L), but having a H tone after the unaccented class (e.g. LL+ H). For example, /memi/, LH/ ‘cicadas’ and /pʲaŋwʌn/, LL/ ‘a hospital’ are both realized as [LH] in isolation ([memí] vs. [pʲaŋwʌ́n]), but /memi/ + /-ka/ ‘NOM’ is realized as [memíga] [LHL] ‘cicadas-NOM’, while /pʲaŋwʌn/ + /-i/ ‘NOM’ is realized as [pʲaŋwʌní] [LLH] ‘a hospital-NOM’. Since the suffix showing a H tone after the unaccented noun is not accented and the unaccented noun ends with a H tone when produced phrase medially, we can assume that the H tone on the suffix is from the preceding noun. Therefore, we analyze that all unaccented words have a floating H tone (H’) specified after the L on the final syllable, i. e. /LH’/ for a monosyllabic word, and /L.LH’/ for a bisyllabic word, and /L.L.LH’/ for a trisyllabic word, etc. The floating H of the unaccented noun would then be realized on the unaccented suffix if there is one, but on the final syllable of the noun if there is no unaccented suffix (e.g. /pʲaŋwʌn/, LLH’/ + /-i, L/ ‘NOM’ => [pʲaŋwʌní] ‘a hospital-NOM’, but [pʲaŋwʌ́n] ‘a hospital’). The tonal pattern of a compound word described below can further support this analysis.

5 The final tone of the surface tonal pattern of these unaccented or final accented words is indeed [H], realized on the final syllable of the word when the words are produced phrase-medially as one Accentual Phrase, as can be seen in the next section. However, when these words are produced in isolation or phrase-finally, the final syllable of these words is not realized with [H], but with [HL], a falling tone. The final L of the falling tone must be an IP-final L boundary tone (L%), which is added after the final H tone on the final syllable of the word. This indicates that the boundary tone of a phrase does not override a lexical H tone.

In Yanbian Korean, most content words are lexically accented and most suffixes (case markers and postpositions, e.g. /-i/-ka/ 'NOM', /-(l)il/ 'ACC', /-(n)in/ 'TOP', /-(k)wa/ 'conjunctive marker', /-katʰi/ or /-tʰʌlam/ 'like', /-to/ 'also') are lexically unaccented. There seem to be only a few accented suffixes (we have found four accented suffixes: /-hantʰé, LH/ 'DAT (colloquial)', /-mankʰim, LH/ 'as much as', /eké, LH/ 'DAT (literal)', /kʰésʌ, HL/ 'NOM (honorific)'). When an accented lexical noun and an accented suffix form one prosodic word, the lexical H of the suffix survives and that of the noun is deleted, meaning only one H survives within a prosodic word, which is often the same as one morphosyntactic word.

Similarly, when multiple accented lexical items form one prosodic word as in a compound noun or a compound verb, only one H survives in each prosodic word and which H survives depends on the part of speech of the component lexical item.⁶ Typically for verbs, the initial morpheme's H tone tends to survive (e.g. /wansʌŋ, HL/ 'completion' + /hes*ta, HL/ 'did' => [wánsʌŋhett*a] [HLLL] 'completed'; /salpʰʌ, LH/ 'to watch' + /pota, LH/ 'try' => [salpʰʌboda] [LHLL] 'try to watch'). For nouns, the last morpheme's H tone survives (e.g. /imhjaŋ, LH/ 'acoustics' + /hjokwa, HL/ 'effect' => [imhjaŋhjók*wa] 'acoustic effect'; /kulim, HL/ 'cloud' + /tali, LH/ 'bridge' => [kurimdari] [LLH] 'skywalk'), except when the compound is derived from two accented mono-morphemic lexical items. In that case, the first H survives, i.e. /H/+H/ => [HL] (e.g. /kʰin, H/ 'big' + /nun, H/ 'snow' => [kʰinnun] 'large amount of snow'). When the last morpheme is unaccented, the compound is always realized with a H tone on the last syllable of the last morpheme, regardless of the tonal type of the preceding morpheme. Again, this pattern can be explained if we assume that the unaccented morpheme has a floating H tone as part of its underlying tone. That is, we can say the floating H of the last morpheme deletes the H (lexical or floating) of the preceding morpheme. For example, /H/+LH/ => [LH]: /kʰin, H/ 'big' + /tʃip, LH/ 'a house' => [kʰindʒip] 'uncle's (father side) family/ household'; /LH/+LH/ => [LH]: /tan, LH/ 'sweet' + /sul, LH/ 'liquor'=[tansúl] 'rice dessert drink'; /HL/+LLH/ => [LLH]: /tonmul, HL/ 'an animal' + /pʌŋwʌn, LLH/ 'a hospital' => [tonmulpʌŋwʌn] 'an animal hospital'. If /-i/ 'NOM' is added to this type of compound, the floating tone is realized on the suffix, e.g. [kʰindʒibi] 'uncle's (father side) family-NOM', [tansurí] 'rice dessert drink-NOM', and [tonmulpʌŋwʌni] 'an animal hospital-NOM'.

⁶ When there are three component morphemes within a compound noun, which is one morphosyntactic word, a prosodic word can be smaller than one morphosyntactic word. This is because a right-branching compound noun, (A (B C)) forms two prosodic words (and two APs). The same phenomenon is found in Seoul Korean (Jun 1993).

As can be seen in the next section, these rules determining the tonal pattern of morphemes within a prosodic word are similar to those applying across prosodic words within an accentual phrase at the phrasal level. But since the application of tonal rules at the phrasal level is sensitive to the accentual phrasing of words, the surface tonal pattern of words at a phrasal level changes depending on accentual phrasing. For example, the adjective, /k^hin, H/ ‘big’, and the noun, /tʃip, LH/ ‘a house’, showed a [LH] pattern as a compound, meaning ‘uncle’s (father side) family’, but if the two words form a noun phrase, meaning ‘a big house’, the tonal pattern of this NP changes depending on the accentual phrasing of the NP. If the whole NP forms one Accentual Phrase (AP; see the next section for its definition), the tonal pattern is the same as that of the compound, [LH] ([k^hindʒip]) ‘a big house’ (or [LLH] if the NP has a suffix, e.g. ([k^hindʒibí]) ‘a big house-NOM’), but if each word of the NP forms its own AP and the APs are Intonation Phrase-medial, the tonal pattern of the NP is [HL], i.e. ([k^hin])([tʃip]) ‘a big house’.

Finally, the tonal analysis of this dialect may differ across studies (cf. H. Jun 1998) and the tonal pattern of a certain lexical item may slightly differ across speakers. But as can be seen in the next section, the *location* of lexical H tone within a word does not matter much in the current study because the focus of the current study is not word prosody but phrasal prosody, especially the tonal interaction *between* words in forming an AP.

2.2 Phrasal prosody: Intonationally defined prosodic structure of Yanbian Korean

The prosodic structure of Yanbian Korean is similar to that of Seoul Korean in having three prosodic units above a Word. They are IP, ip, and AP.⁷ A

⁷ The prosodic structure of Yanbian Korean (YK) is slightly different from that of North Kyungsang Korean (NKK), a lexical pitch accent dialect spoken in South Korea. Researchers working on the prosodic hierarchy of NKK in the framework of prosodic phonology (Kim 1996; Kenstowicz and Sohn 1997; Sohn 1999, 2000, 2001) proposed two prosodic units above the word, i.e. Phonological Phrase (PhP) and Intonational Phrase (IP). Their PhP roughly corresponds to the AP proposed in the current paper except when the PhP is formed by focus, in which case their PhP corresponds to an ip in the current model. On the other hand, the prosodic structure of NKK defined in the framework of intonation phonology (Jun et al. 2006) is closer to that of YK proposed in the current model because in their model NKK has three prosodic units defined by intonation, i.e. Prosodic Word < ip < IP. The main difference between Jun et al.’s NKK model and the current model of YK is that the smallest prosodic unit defined by intonation is a Prosodic Word in NKK but an AP in YK. That is, in YK a lexical word can lose their accent if the

tree-diagram of Yanbian prosodic structure defined by intonation is shown in Figure 7. An IP is marked by a boundary tone (L%, H%, LH%, HL%, LHL%)⁸ realized on its final syllable with substantial phrase-final lengthening. In declaratives, when the sentence-final syllable has a lexical H, the declarative-marking L% IP-boundary tone is realized after the lexical H tone, creating a falling tone on the IP-final syllable. This is different from Seoul Korean, where the IP-final boundary tone overrides the boundary tone of the lower level prosodic unit. An ip boundary is also cued by a boundary tone (H- or L-) but with a weaker degree of phrase-final lengthening than that of the IP-final boundary. As in Seoul Korean, an ip boundary is often aligned with the edge of a syntactic constituent, but unlike Seoul Korean, the f₀ peak of APs within an ip is influenced by the syntactic relation among APs. For example, when an ip includes a series of APs, the AP that includes a syntactic head noun has a higher f₀ peak than that of the preceding AP(s) which include a word that modifies the head noun (*modifying* APs), and if there are multiple modifying APs, the f₀ peak of ip-initial modifying AP is higher than that of the following modifying AP(s).

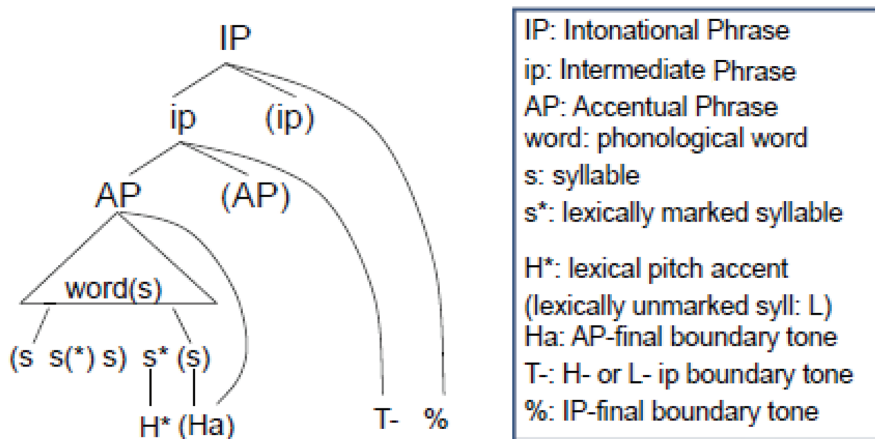


Figure 7: The prosodic structure and intonational marking in Yanbian Korean.

word is part of an AP, while in NKK a lexical word (which is always accented) does not lose their accent and the left edge of each lexical word is marked by a L boundary tone, cueing the left edge of a Prosodic Word.

8 These were the types of IP boundary tones found in the Yanbian data examined (reading sentences and stories, and a role play in a dialogue). More data, especially spontaneous conversation, needs to be examined to see if there are more types of IP boundary tones.

As in Seoul Korean, each word tends to form one AP in Yanbian Korean. However, when more than one word forms one AP, only one lexical H survives within an AP. That is, an AP can have only one lexical H tone (labeled as H*) regardless of the number of accented words in the AP. An AP can also have an optional H boundary tone (labeled Ha), realized on the AP-final syllable when the final syllable lacks a lexical (both fixed and floating) H tone. Therefore, an AP can have maximally two H tones, one lexical and one phrasal, and as in Tokyo Japanese (Pierrehumbert and Beckman 1988; Venditti 1995, 2005) the f0 peak of lexical H (=H*) tends to be higher than that of the phrasal H (=Ha), which is sometimes realized as a mid f0. The presence of Ha and its phonetic realizations vary across speakers and speech style. It seems that speakers tend to use Ha more often in reading than free conversation and even in reading they tend to use Ha more often when producing a word more carefully.⁹ Finally, since pitch is lexically specified in Yanbian Korean, the laryngeal feature of the AP-initial segment does not affect the tonal pattern of an AP as in Seoul Korean. When a syllable is not specified with a lexical H tone, it is realized with a L tone.

Figure 8 shows an example pitch track of the sentence, [tʰumil tʰunin ʌninin norehanin ʌnil purawahanda] ‘dance-ACC /HL/ # dancing /HL/ # a child-TOP

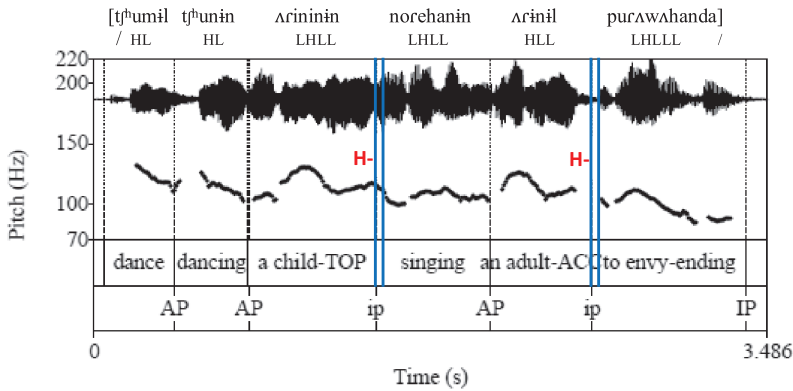


Figure 8: Example pitch track of the sentence, ‘A child who is dancing envies an adult who is singing’, illustrating a prosodic structure of (((AP)(AP)(AP)_{ip}) ((AP)(AP)_{ip}) ((AP)_{ip}))_{IP}.

⁹ The presence of Ha tone varied across speakers, but on average speakers used it about 85% of the time in the reading data.

/LHLL/ # singing /LHLL/ # an adult-ACC /HLL/ # envy-DECL /LHLLL/'¹⁰ => 'A child who is dancing envies an adult who is singing.', illustrating prosodic phrasing of (((AP)(AP)(AP)_{ip}) ((AP)(AP)_{ip}) ((AP)_{ip}))_{IP}. In this sentence, each word forms one AP. The first three APs form one ip, corresponding to a topic noun phrase ('a child who is dancing'), and the next two APs form another ip, corresponding to an object noun phrase ('an adult who is singing'), and the final AP ('envies') forms its own ip. (The ip boundaries are shown by two vertical lines in Figure 8 and later figures.) As mentioned earlier, the f0 peak of the head noun AP in each ip is higher than that of the preceding modifier AP(s), and the end of each ip is marked by a H- boundary tone and a slight lengthening of the ip-final syllable.

Figure 9 shows the pitch tracks of two sentences. Both are three word sentences where each word forms one AP. (a) [jaŋinin jaŋmaniril miwahanda] 'Youngi-TOP /HLL/ # Youngman-ACC /LHLL/ # hate /LHLL/' => 'Youngi hates Youngman'. (b) [jaŋmininin tʰaŋminineril miwahanda] 'Youngmin-TOP /LHLL/ # Changmin's family-ACC /LHLLL/ # hate /LHLL/' => 'Youngmin hates Changmin's family'. In (a), the lexical H of each word is realized as the f0 peak of each AP. The same is true in (b) but an additional f0 peak is shown on the final syllable of the first two APs, which is a H boundary tone (labeled Ha). In the second AP of (b), the L target on the penultimate syllable is clearly observable just before the Ha boundary tone, but in the first AP, the L target on the penult is undershot between the two adjacent H tones (the lexical H on the antepenultimate syllable and the boundary Ha on the final syllable). This type of undershot was observed fairly often in Yanbian Korean (also common in Seoul Korean). Also common is partially undershooting both the penult L and the final Ha when the antepenult has a lexical H, resulting in a mid plateau over the AP-final two syllables (e.g. the end of the second AP in Figure 11(b)).

The AP examples shown in this section include only one word, but this was found when a sentence was produced very carefully. What is more common in casual reading or dialogue role play is a multi-word AP. In this case, the lexical H tone of only one word survives within an AP. Very interestingly, which lexical H survives is not random but depends on the syntactic relation among the words in an AP and the part of speech of the head of a syntactic constituent, i.e. whether the head is a noun or a verb. This is similar to the rules of tonal interaction within a compound, described in Section 2.1. The next section will show the rules of AP formation in the neutral focus condition when the syntactic head is a noun (Section 3.1) or a verb (Section 3.2).

¹⁰ In this paper, the underlying tones provided in the sentence examples are the output tones of a morphosyntactic word, which is a stem/root plus any suffix or a compound noun/verb. This means the underlying tone of each individual morpheme that forms a morphosyntactic word is not given.

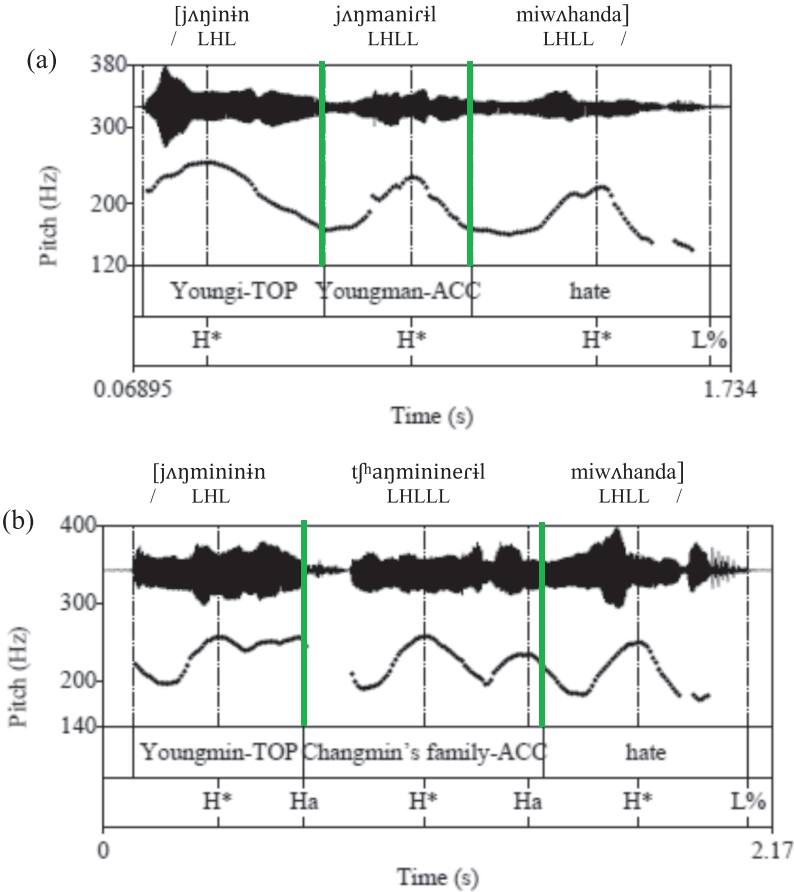


Figure 9: Example pitch tracks of two sentences, with each having three APs (the AP boundary is shown by a thick vertical line. This format is used for all pitch tracks shown in the paper). In (a), the f0 peak of each AP is the lexical H (=H*) of each word. In (b), in addition to the f0 peak from the lexical H, an AP-final H boundary tone (Ha) is shown on the final syllable of the first two APs.

3 Prosodic phrasing in the neutral focus condition

3.1 When the syntactic head is a noun

When a noun is a syntactic head, prenominal modifiers such as adjective, genitive (pro)noun, and a relative clause often form one AP with the head noun, and in

these cases, only the head noun's lexical H survives. Since the head noun comes after the modifiers, the AP shows the rightmost H dominant tonal pattern. As shown in Figure 8, when the modifier and the head noun each forms a separate AP, the head noun's AP peak is higher than that of the modifier AP, showing the same prosodic dominance relationship between the modifier and the head noun within an AP. Figure 10 shows an example pitch track of the sentence, [jaɲinin jaɲmani nunaɾil miwaɬanda] 'Youngi-TOP /HLL/ # Youngmani-(POSS) /LHL/ # nuna-ACC /HLL/ # hate /LHLL/' => 'Youngi hates Youngman's sister.'. This sentence is almost the same as that in Figure 9 (a) 'Youngi hates Youngman'. The only difference is that the object noun phrase in Figure 10 includes a possessive noun modifying a head noun ('Youngman's sister'). In Figure 9 (a), the second AP has only an object noun ([jaɲmaniril] 'Youngmani-ACC' /LHLL/) and shows a H tone from the lexical H of the noun. But in Figure 10, the same noun is used as a possessive noun and the possessive noun's lexical H is deleted when it is followed by the head noun ([nunaɾil] 'a sister-ACC' /HLL/), whose lexical H is the only H tone in the AP. In this case, the degree of juncture between the possessive noun and the head noun is smaller than that between the subject noun and the possessive noun, supporting the prosodic analysis.

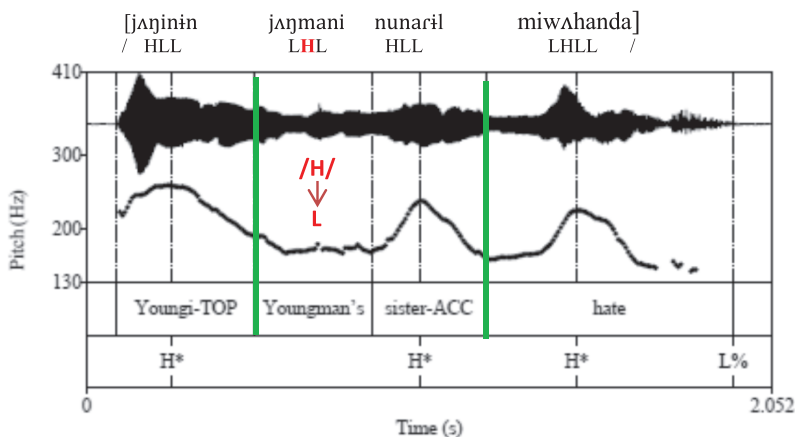


Figure 10: An example pitch track of the sentence, 'Youngi hates Youngman's sister', showing the second AP, ('Youngman's sister-ACC'), has only one f₀ peak, which is from the lexical H of the head noun, 'sister', while deleting the lexical H of the possessive noun, 'Youngman's'.

An example of prosodic phrasing when the adnominal modifier is an adjective is shown in Figure 11 ([aɾinin sanawun mjaɲniriril miwaɬanda] 'The child-TOP # fierce # daughter-in-law-ACC # hate-V-ending' => 'The child hates the fierce daughter-in-law.'). When the adjective, [sanawun]/LHL/

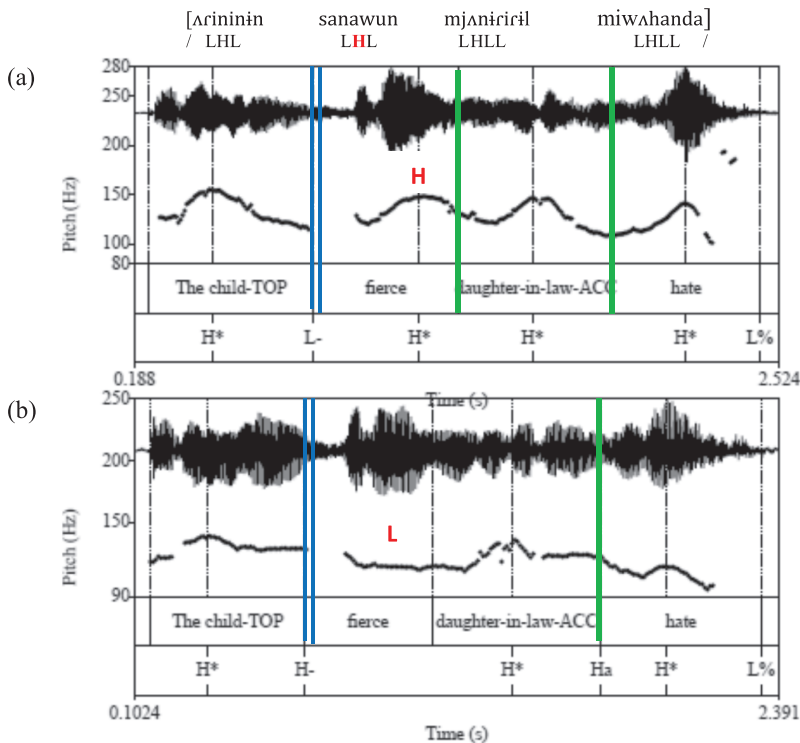


Figure 11: Example pitch tracks of the sentence, ‘The child hates the fierce daughter-in-law.’, produced in two different accentual phrasings: (a) when the adjective ([sanawun] ‘fierce’) and the following noun ([mjʌnɪrɪl] ‘a daughter-in-law-ACC’) each forms one AP and (b) when the adjective and the noun together form one AP, indicated by the deletion of the adjective’s lexical H while keeping the lexical H of the head noun.

‘fierce’, and the noun, [mjʌnɪrɪl]/LHLL/ ‘daughter-in-law-ACC’, each forms its own AP as in Figure 11(a), the lexical H tone of each word is realized as an f0 peak of each AP. But when the two words form one AP as in Figure 11(b), the AP has only one f0 peak, corresponding to the lexical H of the noun, [sanawun mjʌnɪrɪl]. That is, the lexical H of the adjective is deleted when it forms one AP with the following head noun.

A heavier adnominal modifier such as a relative clause before a complex head noun shows that all adnominal modifiers except for the head of the complex head noun lose their lexical H tone when they all form one AP. An example pitch track is shown in Figure 12, [pɪʌwʌne ibwʌnhan tɔŋɲɔe puini ne tɔŋsɛŋe tʰɪŋɪŋda]

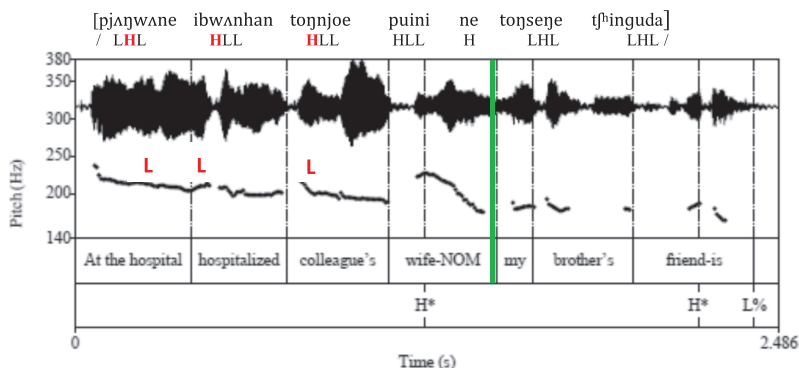


Figure 12: Example pitch track of the sentence, ‘(My) colleague’s wife who is hospitalized is my brother’s friend.’, produced in the neutral focus condition. Here, the relative clause (the first two words) and the following complex NP head noun (the next two words) form one AP. In this AP, all lexical H tones of adnominal modifiers before the final head noun are deleted and only the lexical H tone of the head noun (‘wife-NOM’) survives.

‘hospital-LOC /LHL/ # hospitalized /HLL/ # colleague-POSS /HLL/ # wife-NOM /HLL/ # my /H/ # brother-POSS /LHL/ # a friend-is /LHL/’ => ‘The wife of (my) colleague who is hospitalized is my brother’s friend’. Here, the first AP includes a relative clause and a complex NP head noun, and shows only one H tone, which is from the lexical H of the head noun of the whole NP ([puini] ‘wife- NOM’). All other lexical H tones of the words within the relative clause ([pjaŋwane ibwanhan] ‘who is hospitalized’) as well as that of the possessive noun ([toŋnjoe] ‘colleague’s’) in the complex NP are not realized, showing the rightmost H dominant tonal pattern. In this prosodic phrasing, the relative clause unambiguously modifies the first noun of the complex NP head noun, i.e. ‘(my) colleague is hospitalized’. That is, the relative clause attaches ‘low’ (Frazier 1978, 1987). If the relative clause modifies the second noun of the complex NP (i.e. ‘colleague’s wife is hospitalized’), i.e. attaching ‘high’, an AP boundary is realized after the relative clause, separating from the complex NP. This way of prosodic disambiguation of a globally ambiguous sentence is also found in Seoul Korean (Jun and Kim 2004; Jun 2007, 2009).

Similarly, accentual phrasing can disambiguate a locally ambiguous string of words. In Korean, a string of a subject (or topic) noun followed by an object noun can be locally ambiguous between the two words being in the main clause or the object noun being in an embedded clause. For example, the string of four words, [jaŋmaninin pandʒiril tʃoahanin mjaŋhiege] ‘Youngman-TOP /LHLL/ # a ring-ACC /LHL/ # like-Rel.marker /HLLL/ # Myunghee-DAT’ /LLH/, can be ambiguous between two interpretations as shown in (1a) and (1b) below.

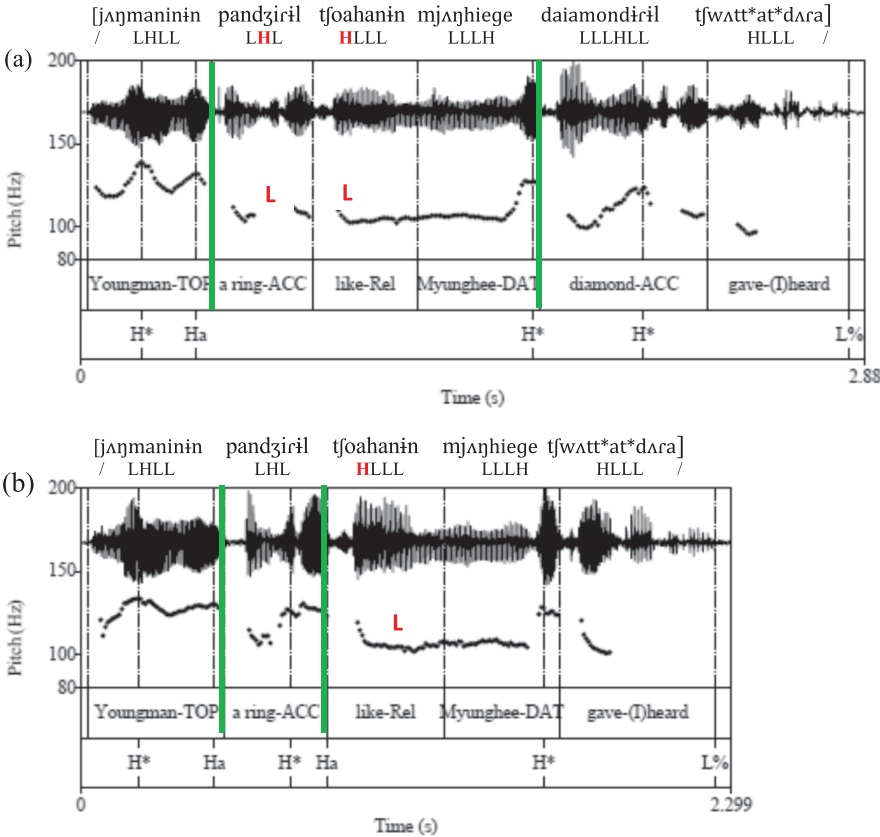


Figure 13: Example pitch tracks of the sentences in (1a) and (1b). The first four words in these two sentences are the same, but in (a) the second, the third, and the fourth word form one AP, where the second word ('a ring'), not realizing its lexical H tone, is an object of an embedded clause, while in (b) the second word ('a ring'), realizing its lexical H, is the object of the main clause.

Figures 13 (a) and (b) illustrate different accentual phrasing reflecting the two different interpretations in Yanbian Korean. In (1), '['' marks an IPA transcription and '}' marks a syntactic grouping.

- (1) [jaŋmaninin pandziril tfoahanin mjəŋhiege (daiamondiril)
Youngman-TOP a ring-ACC like-rel cl. Myunghee-DAT diamond-ACC
tfwatt*at*dara]
gave-I heard

- a. {ʃʌŋmaninin} {[pandʒiril tʃoahanin] mʲʌŋhiege} diamondiril tʃuatt*adɾa
=> 'I heard that Youngman gave a diamond to Myunghee who likes a ring.'
- b. {ʃʌŋmaninin} {pandʒiril} {[e_i tʃoahanin] mʲʌŋhiege} tʃuatt*adɾa.
=> 'I heard that Youngman gave a ring to Myunghee he likes.'

The accentual phrasing in Figures 13 (a) and 13 (b) corresponds to the interpretation of (1a) and (1b), respectively. In Figure 13 (a), the lexical H of the second word, the object noun ([pandʒiril] 'a ring-ACC'), is deleted, suggesting that the object noun is a part of an embedded clause. That is, the object and the following verb form a relative clause modifying the head noun ('Myunghee-DAT') of the relative clause. But in Figure 13 (b), the lexical H of the second word ('a ring-ACC') is surfaced, forming an AP by itself, suggesting that the word is not a part of the embedded clause, but is the object noun of the main clause. The tonal patterns in Figure 13 show that, as in Seoul Korean, accentual phrasing of a sentence signals attachment differences and syntactic constituency (Schafer and Jun 2002; Jun 2003; Jun and Kim 2004; Jun 2007). In Yanbian Korean, prosodic cues of grouping a string of words into accentual phrasing are marked by the presence or the absence of the lexical H realization while in Seoul Korean it is done by the presence or the absence of an AP boundary tone. In sum, this section illustrates that in Yanbian Korean the head noun of a noun phrase keeps its lexical H but the preceding modifier(s) of the head noun lose their lexical H when together forming one AP, thus creating a rightmost H dominant tonal pattern in an AP.

3.2 When the syntactic head is a verb

When a verb is a syntactic head, the preceding argument (e.g. a direct or indirect object noun, a locative noun) can form one AP with the verb, and in this case, the lexical H of the preverbal argument survives and the verb loses its lexical H, showing the leftmost H dominant tonal pattern. Figure 14 shows an example pitch track of the sentence, [ʌrininin mʲʌniriego k^hoallaril ponetta] 'a child-TOP /LHLL/ # a daughter-in-law-DAT /LLLLH/¹¹ # koala-ACC /LHLL/ # sent /LHL/'=> 'A child sent the daughter-in-law a koala'. Here, the lexical H of the object noun, 'a koala', survives and that of the verb 'sent' is deleted, cueing that the object noun and the verb together form one AP, and the AP shows the leftmost H dominant pattern.

¹¹ The underlying tone of [mʲʌniriego] 'the daughter-in-law' is /LHL/, but as mentioned in Section 2.1, the dative case marker /-eke, LH/ is an accented suffix. So, when the noun and the dative case marker combine to form a morphosyntactic word, the lexical H of the stem is deleted and that of the suffix survives, resulting in /LLLLH/. That is, the H here is not Ha, but H*.

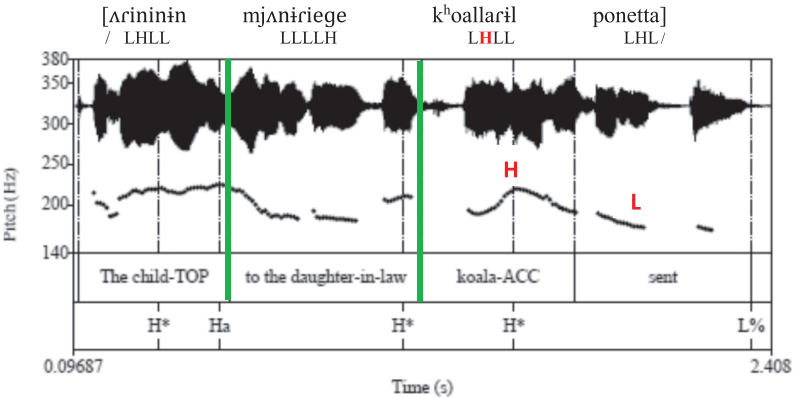


Figure 14: An example pitch track showing that when an object noun ('koala-ACC') and a verb ('sent') form one AP, the lexical H of the object noun survives, not that of the verb, a syntactic head.

In Section 3.1, we showed that the lexical H of a head noun survives when it forms one AP with the preceding modifier(s). In this section, we show that the lexical H of an object noun survives when it forms one AP with the following verb. Therefore, if the head noun of an NP is an object noun of the following verb, the whole VP, i.e. a modifier # a head noun # a verb, can form one AP, with the lexical H of the head noun being the only H tone of the long AP. An example pitch track is given in Figure 15.

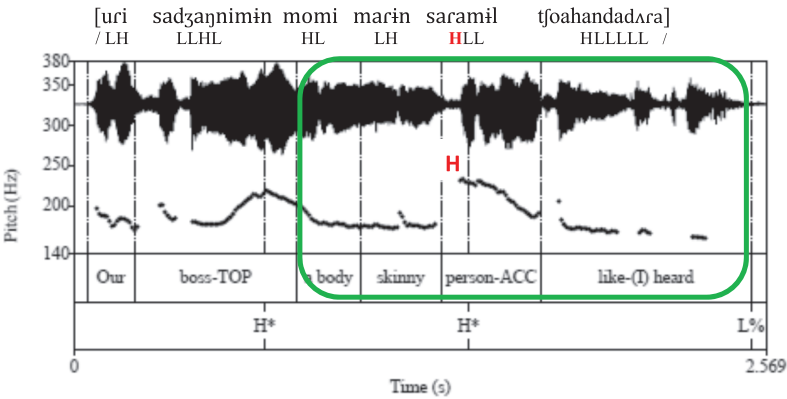


Figure 15: Example pitch track of a sentence, 'I heard our boss likes those who are skinny', where a relative clause ('a body # skinny') and the head noun ('person-ACC'), which is the object of the verb, and the verb ('like-I heard') all form one AP. This long AP is marked by a rectangular box in the figure, showing that the lexical H of the object noun is the only H of the long AP.

Here, an object noun ([saramil] /HLL/ ‘person-ACC’) is modified by a relative clause ([mom-i] /HL/ ‘body-NOM’ # [marin] /LH/ ‘is skinny’), and this object NP is an argument of the following main verb ([tʃoahandadɾa] /HLLLL/ ‘likes, (I) heard’), thus all four words forming one AP. As can be seen, the lexical H of the object head noun is the only H tone of the whole AP.

In Figure 13 (a), we showed that the object noun (i.e. the second word, ‘a ring’) lost its lexical H tone because it is part of an embedded clause together with the following verb. In that case, we could expect that the lexical H of the object noun can survive before the verb. However, since both the object noun and the verb are modifying the following head noun as a relative clause, no lexical H tone of the relative clause survived, suggesting that which words form one AP and which lexical H survives in an AP depend on the overall syntactic relation among the words in a sentence, instead of a local syntactic relation between two adjacent words.

So far, we have shown that a verb does not become the prosodic head (i.e. hosting the H* tone) of an AP when it is preceded by its argument. However, when a verb forms one AP together with a preceding adverb, the verb does not always lose its lexical H. For adverbs like /jalsimhi, HLL/ ‘(work) hard, diligently’, /alt*ilhi, HLL/ ‘earnestly, frugally’, /putilapke, LHLL/ ‘softly, smoothly’, /p*alike, LLH/ ‘fast’, the adverb always keeps its lexical H and the verb loses its lexical H. But for adverbs like /tantanhi, LLH/ ‘firmly’, /komkomi, LLH/ ‘deeply (thinking)’, /tintinhi, LLH/ ‘reassuringly, strongly’, /ɟaki, LH/ ‘here’, /kak*ai, LLH/ ‘closely’, and /meu, LH/ or /mutʰɟk, LH/ ‘very’, either the adverb or the verb keeps its lexical H. At the moment, it is not clear what features distinguish between these two groups of adverbs. Further research is needed.

4 Prosodic phrasing in the focus condition

All the accentual phrasing data and the direction of the prosodic head in an AP shown in Section 3 were based on utterances produced in the neutral focus condition: An AP that includes a noun phrase has the rightmost H dominant pattern, but an AP that includes a verb phrase, especially an object and a verb, has the leftmost H dominant pattern. However, accentual phrasing formed by focus does not have any difference in the directionality of the prosodic head depending on the type of the syntactic head. Instead, a focused AP always shows the leftmost H dominant pattern (except for when L* is used for focus marking; see later). That is, when a word is narrowly focused, the focused word

begins an AP and keeps its lexical H while deleting the lexical H of post-focus words.¹² This is true regardless of the type of syntactic head.

Figures 16 and 17 illustrate how the AP that begins with a focused word shows the leftmost H dominant tonal pattern regardless of the type of syntactic head. Figure 16 shows pitch tracks of the sentence, [mjʌnirinɪn hwalbalhan ʌriniril t*erjatta] ‘daughter-in-law /LHLL/ # active /HLL/ # a child-ACC /LHLL/ # hit /LHL/’ => ‘The daughter-in-law hit the active child’, produced (a) in the neutral focus condition and (b) with the adjective focused. (a) shows how the adjective [hwalbalhan] ‘active’ /HLL/, lost its lexical H before the head noun, [ʌriniril] ‘a child-ACC’ /LHLL/, resulting in [LLLLHL-Ha], and (b) shows how the lexical H of the focused adjective revives, with expanded pitch range (labeled fH*), as the prosodic head of an AP, while deleting the lexical H of the noun and the following verb.

Figure 17 shows the pitch track of the same sentence as that in Figure 14, but produced with narrow focus on the object noun, ‘koala’. Here, the focused AP (‘koala-ACC # sent’) shows the leftmost H dominant pattern, which is the same as that in Figure 14 where the sentence was produced in neutral focus. The difference between these two is that in the focused version the lexical H of the focused word shows an expanded pitch peak (labeled fH*) and a bigger juncture before the focused word.

In addition to marking focus by expanding pitch range of lexical H of the focused word and deleting or compressing any H tone on the post-focus words (which we call *focus by lexH**), Yanbian Korean has two other ways to focus a lexical item. They are *focus by Ha* and *focus by postlexL**. Focus by Ha is when a focused word forms its own AP and the pitch range of the AP-final boundary H tone (Ha) is expanded, not the pitch range of the lexical H. Focus by postlexL* is when the first syllable of the focused word is emphasized by increasing the intensity and duration of the syllable as well as the clarity of segment articulation, but not by raising f0.¹³ That is, the emphasis is given on the first syllable of the focused word, regardless of whether the first syllable is lexically accented or not. In this case, the focused word is not realized with its lexical H (though it can be optionally realized with the boundary Ha), but the following word is consistently realized with its lexical H.

¹² The domain of post-focus H deletion is generally the maximal projection of a head, e.g. Noun Phrase, Verb Phrase, but the lexical H of the head noun is often not deleted when the NP is *heavy* and NP-initial modifiers are focused. See later in this section for more details. Furthermore, some speakers do not completely delete the lexical H tone of post-focus words, but instead produce the post-focus APs in substantially reduced pitch range, which is fairly common across languages (Jun 2014a).

¹³ The label, *L**, is simply to reflect the phonetic realization of the word-initial syllable, i.e. louder and longer and clearer articulation but in low pitch. The diacritic “*” is used here just to mark phonetic prominence and does not mean that the syllable is lexically stressed or accented as implied by the diacritic “*” in English or Japanese.

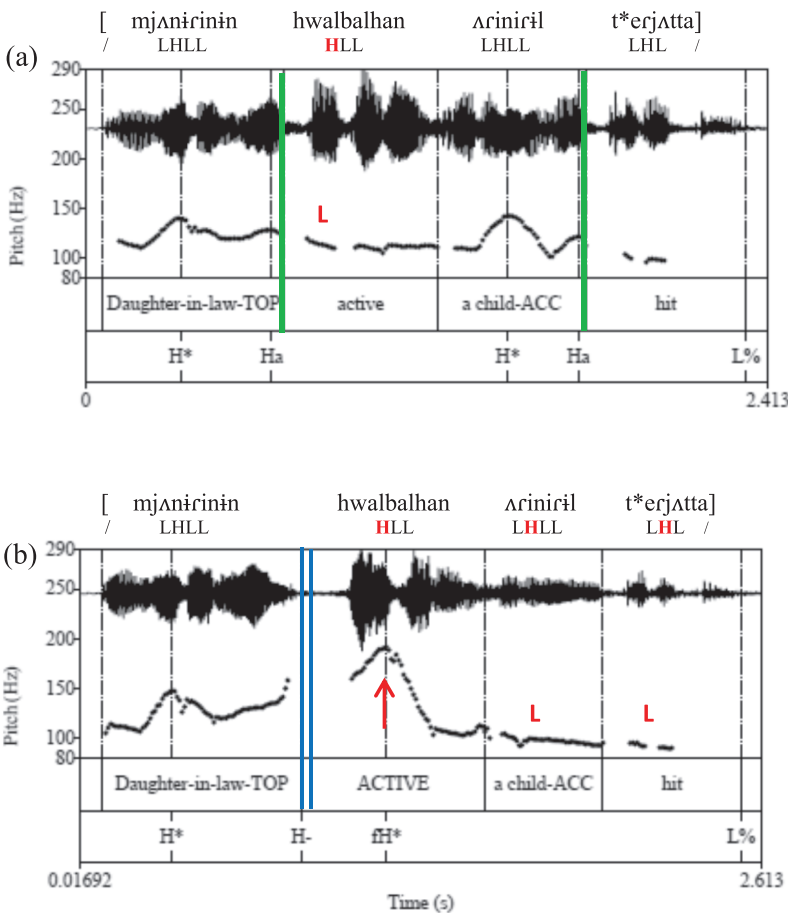


Figure 16: Example pitch track of the sentence, ‘The daughter-in-law hit the active child’, produced (a) in neutral focus, showing the adjective and the noun forming one AP with the rightmost H dominant pattern, and (b) when the adjective ‘active’ is narrowly focused (the f0 peak labeled with fH*), showing the adjective and the following words forming one AP (and one ip) with the leftmost H dominant pattern.

Therefore, both focus by Ha and focus by postlexL* are ways to make a word prominent not by emphasizing the ‘head’ of the word but by emphasizing the ‘edge’ of the word. Focus by Ha is emphasizing the right edge of the focused word while focus by postlexL* is emphasizing the left edge of the focused word.

The focus by Ha is often used when the syntactic function of a word (e.g. subject, topic, possessive) or the relationship between words is emphasized

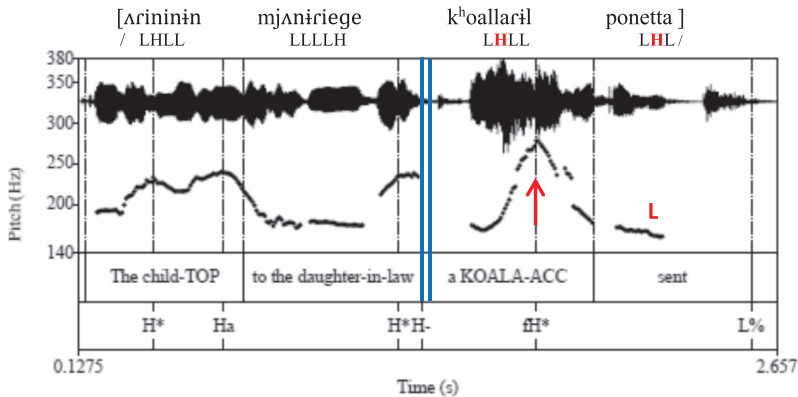


Figure 17: Example pitch track of the same sentence shown in Figure 14, but produced with narrow focus on the object noun, ‘koala-ACC’. The object noun’s lexical H becomes the peak of the AP, with expanded pitch range (labeled fH*), and the lexical H of the verb is deleted, showing a leftmost H dominant tone pattern.

(since a case marker or a postposition is often the final syllable of a word, where ‘Ha’ is realized). An example of focus by Ha is shown in Figure 18, where the second word (‘SISTER-ACC’) is narrowly focused. Here, the Ha tone on the unaccented accusative case marker [-il] at the end of the focused word is higher (labeled ‘fHa’) than the peak of the lexical H (H*) on the first syllable of the word.¹⁴

Marking focus via *focus by Ha* can be used to focus a head noun as well as a modifier of a head noun. However, *focus by postlexL** is rarely used to focus a word which is the prosodic head of a multi-word AP (e.g. the head noun of an NP, the object noun of a VP). Instead, focus by postlexL* seems to be a preferred way of focusing a word which is immediately preceding the head noun of a heavy syntactic constituent. In that case, the head noun is realized with its lexical H tone even though it is right after the focused word. This suggests that realizing the lexical H of the head noun of a heavy syntactic constituent (as discussed in Section 3.1) is given a higher priority than the prosodic marking of focus with H (i.e. expanded pitch range) on the non-head lexical item. That is,

¹⁴ We have also observed that the focused Ha tone (fHa) is sometimes the only H tone on the focused word, suggesting that fHa can delete the H* of the focused word at the postlexical/phrasal level. Furthermore, as shown in Figure 18, a word after fHa sometimes loses its lexical H, like the words after fH*, even though the presence of fHa means there is an AP boundary after the focused word. This means fHa functions like fH*.

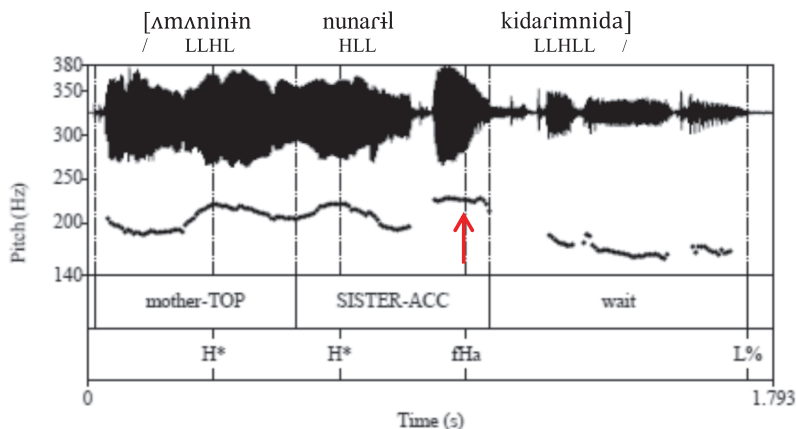


Figure 18: Example of *focus by Ha*. Narrow focus on the second word ('sister') in the sentence, 'Mother is waiting for (my older) SISTER.', is cued by raising the Ha tone (labeled fHa) on the word's final syllable, [-i] 'an accusative case marker', higher than the preceding H tone, the lexical H of the focused word.

when a syntactic constraint on prosody (i.e. the lexical H of a syntactic head noun of a heavy syntactic constituent should be realized) is in conflict with a focus constraint on prosody (i.e. pitch range of the focused item should be expanded and any H tone of post-focus items should be deleted), the syntactic constraint is ranked higher than the focus constraint. This is similar to the findings in Jun (2002) where the speakers of Seoul Korean chose to violate the focus constraint when it is in conflict with the syntactic constraint.

Figure 19 (a) illustrates an example of focus by postlexL*. The sentence in this figure is the same as that in Figure 12, where the sentence is produced in the neutral focus condition (the figure is redrawn as Figure 19 (b) by adding an intensity contour). In Figure 19 (a), the third word ([toŋnjoe] /HLL/ 'a colleague's'), a word immediately before the head noun of a heavy NP, is narrowly focused, but the focused word is produced as low flat f0, like the word produced with neutral focus in Figure 19 (b). However, the first syllable [toŋ] (marked by a rectangle in the figure) of the focused word is produced with longer duration and higher intensity (the intensity contour is given below the waveform and above the pitch track) compared to the same syllable produced in the neutral focus condition shown in Figure 19 (b).¹⁵ Therefore, the word-initial syllable is

¹⁵ The duration of the first syllable [toŋ] is 243 ms in Figure 19(a) vs. 199 ms in Figure 19(b). The duration of the following head noun is 344 ms and 383 ms in Figures 19(a) and (b), respectively.

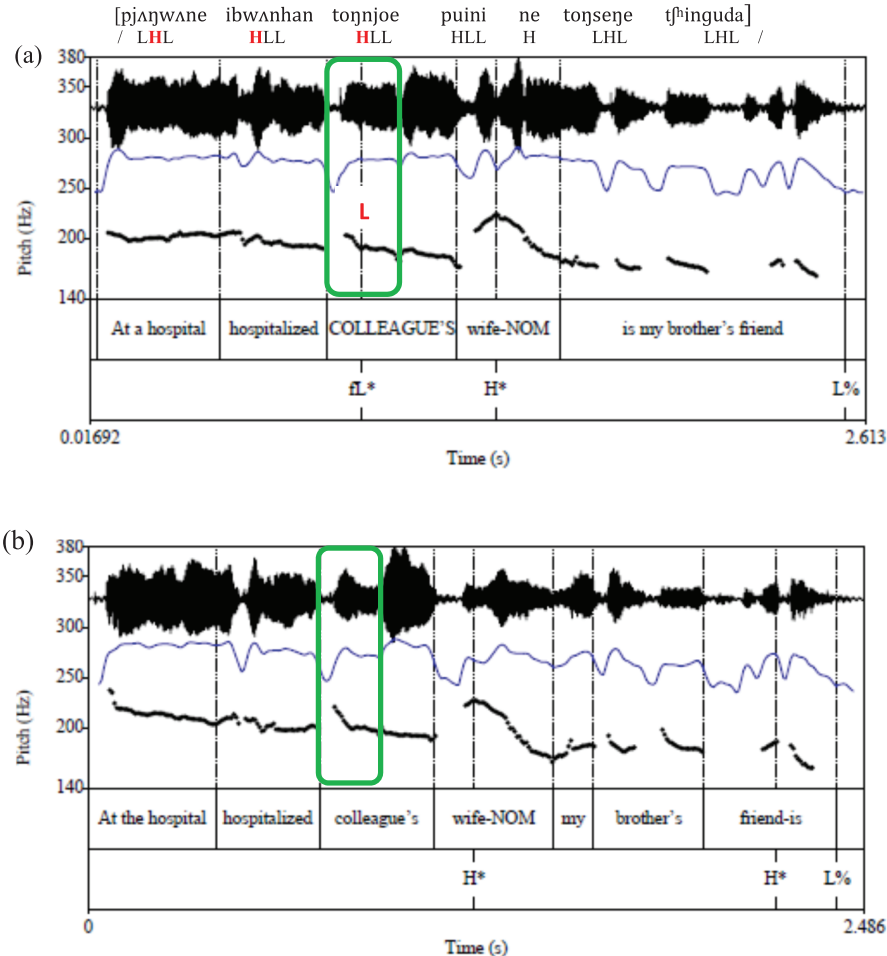


Figure 19: Example pitch track of the same sentence as that in Figure 12. (a) shows an example of *focus by postlexL**. The third word, [tonɲjoe] /HLL/ 'colleague's', is narrowly focused, cued by longer duration and stronger intensity of the first syllable (marked by a rectangle) than that in (b), which is Figure 12 redrawn by adding an intensity contour. In both figures, the lexical H on the first syllable is not realized (The higher f0 at the very beginning of the syllable is due to the voiceless onset).

That is, the duration of the head noun after the focused word with *fl** is shortened even though the head noun is realized with *H**. The intensity of the first syllable, [ton], in Figure 19(a) is 81 dB throughout the whole syllable, but the intensity is weakened from 81 dB to 77 dB during the same syllable in Figure 19(b).

labeled *fL** (i.e. focus-marking *L**). Furthermore, the head noun immediately following the focused word is realized with its lexical H tone. In fact, when any of the preceding adnominal modifiers in a heavy NP is narrowly focused (realized with *fH**, *fHa*, *fL**), the lexical H of the head noun is always realized, instead of being deaccented after focus. This again shows the importance of marking a syntactic head noun over prominence marking of non-head items.

In sum, Yanbian Korean has three ways of marking focus prosodically: focus by *lexH**, *Ha*, and *postlexL**. In general, focus by *lexH** is the most common way of focus marking when a word is the prosodic head of a multi-word AP. However, the focus by *postlexL** is used the least often in the same prosodic condition. In addition, narrowly focusing a sentence-final word is done only by focus by *lexH**. This is because focus by *Ha* and focus by *postlexL** are used when the focused item is followed by another word. Finally, focus by *Ha* can be used to focus either the head noun of an NP or modifier words. The focus-marking *Ha* tone (*fHa*) functions like a focus-marking lexical H tone (*fH**) in that it can delete, though postlexically, the preceding lexical H tone of the focused word as well as the lexical H tone of the post-focus word(s).

5 Discussion and conclusion

The accentual phrasing in Yanbian Korean marks prominence relationships among the words as well as syntactic groupings of words. We have shown that the syntax-marking AP has a rightmost dominant H tonal pattern when the syntactic head is a noun, but a leftmost dominant H tonal pattern when the syntactic head is a verb. We have also shown that the prominence-marking AP typically has a leftmost dominant H tonal pattern with expanded pitch range, followed by compressed pitch range. That is, when a word is prominent, it becomes AP-initial and its H tone is realized. This may suggest that the preverbal argument, which raises its lexical H tone when it forms an AP together with the following verb, is underlyingly or structurally prominent in Yanbian Korean. This is in line with the claim made by Greenberg (1966) and other researchers working on syntactic typology (Dezso 1974, 1982; Kim 1988; Choi 1996) that, in languages that have an SOV word order like Turkish (i.e. Type XXIII languages in Greenberg's 1966 typology), a preverbal argument is syntactically prominent. In other words, the leftmost H dominant AP when it begins with a preverbal argument is probably to mark the prominence of the argument. This would then make all APs with the leftmost dominant H a prominence marking AP in Yanbian Korean. Further research is needed to see if there is

any difference in the realization of the leftmost H dominant AP when it functions as a prominence marking vs. a syntax marking.

In Yanbian Korean, an AP is the smallest prosodic unit that has the dual function of marking prominence and syntactic structure. But in Seoul Korean, an Intermediate Phrase (ip) is the prosodic unit that has the same dual function: Prominence is marked by expanded pitch range ip-initially while a syntactic grouping is marked on its right edge by an ip-final boundary tone. These two prosodic units, AP in Yanbian Korean and ip in Seoul Korean, share common prosodic properties. Prominence is marked by expanded pitch range at the left edge of a phrase, but syntactic grouping, especially a noun phrase, is marked by tones at the right edge of a phrase (this is so if we interpret the accentual phrasing of ‘object noun + verb’ in Yanbian Korean as prominence marking of the pre-verbal argument. In this case, the AP-initial H tone is often slightly higher than or equal to the preceding H, suggesting a mild pitch range expansion. But what is common with the AP formed from narrow focus and the AP formed from ‘object noun + verb’ is that both APs begin with a H tone and ends with H deaccenting). Therefore, in these two varieties of Korean, prosodic phrasing marks both prominence and syntactic grouping but the prosodic properties of phrasing differ phonologically and phonetically depending on the function of the prosodic phrasing. Do other languages also use different properties of prosodic phrasing to mark prominence and syntax?

The effect of syntax on prosodic phrasing seems to be similar across languages by matching the boundaries of major syntactic units with the boundaries of major prosodic units (e.g. Selkirk 1986, 2011; Nespor and Vogel 1986/2007; Truckenbrodt 1999). But the effect of focus, i.e. prominence, on prosodic phrasing would differ across languages because languages differ in their ways to mark prominence prosodically. In the model of prosodic typology proposed in Jun (2005, 2014b), languages are classified in three ways based on the way they mark prominence postlexically. The three ways of prominence-marking are called *head* prominence (prominence is cued by pitch, duration, or intensity on the head, i.e. a specific mora/syllable of the word), *edge* prominence (prominence is cued by pitch/duration/intensity on the edge of a word or a phrase), and *head/edge* prominence (prominence is cued by both the head and the edge). Languages that have lexical stress or lexical pitch accent/tone (e.g. English, Spanish, Swedish, Chinese) belong to the head-prominence language, while languages that have no such word prosody but mark the edge(s) of word by phrasal tones (e.g. Korean, West Greenlandic, Mongolian) belong to the edge-prominence language, and languages that have lexical or postlexical stress but

also have a phrasal tone marking the edge of a word (e.g. French, Bengali, Georgian, Turkish) belong to the head/edge-prominence language.

Though Seoul Korean is an edge-prominence language, Yanbian Korean would be a head/edge-prominence language because a prominent word is cued by its lexical H tone on a specific syllable of the word as well as by being located at the beginning of an AP. Since both edge-prominence and head/edge-prominence languages make a word prominent by putting it on the edge of a phrase, i.e. manipulating prosodic phrasing, it is likely that languages belonging to these two types of prominence marking category would show some interaction between prosodic phrasing to mark syntax vs. focus. However, languages belonging to the head-prominence marking category would not much use prosodic phrasing to mark prominence. For example, in English, a typical head-prominence language, focus is marked by changing the prosodic properties of head, i.e. by changing the type of pitch accent on the focused word as well as by deleting pitch accents on post-focus word(s).¹⁶ Since each Intermediate Phrase (ip) has only one nuclear pitch accent in English (Beckman and Pierrehumbert 1986; Beckman et al. 2005), changing the prominence relationship among words does affect the presence of pitch accent and the phonetic realizations of the prosodic unit involved, but not prosodic phrasing. Native speakers of American English sometimes insert a big prosodic break before and/or after a focused word to further emphasize the focused word, thus changing prosodic phrasing. However, the most common way to mark focus in English is not to change the location of the focused word in a phrase. That is, a focused word is not necessarily located at the beginning or the end of a prosodic unit. What is important in English is that a focused word has to carry a nuclear pitch accent, meaning the pitch accent on the focused word has to be the last pitch accent in an ip, regardless of the number of words preceding or following the focused word in the phrase. Therefore, prosodic phrasing would be weakly involved in prominence marking in head-prominence languages.

In conclusion, we have shown that, as in Seoul Korean, prosodic phrasing in Yanbian Korean can be influenced by syntax and prominence, and the intonational marking of prosodic phrase differs when it marks syntactic grouping vs. prominence. Prominence is cued by accentual phrase-initial H, while syntactic grouping, especially an NP, is cued by accentual phrase-final H. Furthermore, only a prominence-marking prosodic phrase shows pitch range expansion phrase-initially, followed by pitch range compression. This difference in

¹⁶ Deaccenting over a post-focus string is common but is not always observed in stress-based head-prominence languages (e.g. Italian).

prosodic phrasing due to its dual function may exist in other languages where prominence is marked by either a boundary tone or by being at the edge of a prosodic unit (i.e. edge-prominence and head/edge-prominence languages in Jun's (2014b) model of prosodic typology), but probably not much in languages where prominence is marked by enhancing prosodic properties of the head syllable (e.g. stressed syllable) of a word (i.e. head-prominence languages in Jun's typology). More research is needed to confirm these predictions and generalize the current findings.

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