

INTONATION AND PROSODY OF THE DECLARATIVE SENTENCE TYPE IN SEOUL KOREAN

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ABSTRACT It has been claimed that the declarative sentence type in Seoul Korean mostly has a falling terminal pitch/F₀ contour. Further, it has been claimed that imperative and propositive sentence types also have a falling terminal pitch/F₀ contour, thus when declarative has the same morphosyntactic structure with imperative and propositive sentence types, the three sentence types can be distinguished only by contextual cues rather than phonetic cues. However, the previous studies do not acknowledge that the three sentence types can have different intonationally defined phrase structures, especially the so-called 'Accentual Phrase' structure. This paper, therefore, investigates boundary tone types and accentual phrase structure of declarative sentence type in Seoul Korean. It is shown that the declarative can have at least six different boundary tone types and forms different accentual phrase structure from imperative.

1. INTRODUCTION

In Seoul Korean, the four major sentence types – declarative, imperative, propositive and interrogative – cannot be distinguished morphosyntactically in many cases of conversational speech. It has been claimed that morphosyntactically equivalent declarative, imperative, and propositive sentence types have the same falling pitch/F₀ contour at the end of the sentence, and, furthermore, that the three sentence types can only be distinguished by contextual rather than phonetic (intonational) cues (see, for example, Martine 1954; Lee 1989; Park 1991; Sohn 1994 etc.).

The main problem with the previous studies on Korean intonation, however, is that pitch/F₀ contour was the only parameter used in distinguishing the three sentence types. These studies disregarded intonational phrasing, especially the so-called *accentual phrase* (Pierrehumbert & Beckman 1988; Jun 1996; Jun and Oh 1996). The importance of the accentual phrase in distinguishing sentence types and meanings has been tested and demonstrated by Jun and Oh (1996) and Yim (2002).

This paper, therefore, examines intonation of the declarative sentence type, using two parameters – boundary tone types and accentual phrase structure.

1.1. Accentual Phrase

The accentual phrase (AP) in Seoul Korean is one of the two prosodic levels that are marked by intonation (there are only two levels of phrasing, the accentual phrase (AP) and intonational phrase (IP) since Seoul Korean does not have a lexical pitch accent (Jun 1998; Jun and Oh 1996)). This analysis was suggested by Beckman and Pierrehumbert (Pierrehumbert & Beckman 1988) to explain the contrast between accent and lack of accent in Japanese. Later, this term was adapted to Korean by Jun (1996). According to Jun (1998), the AP in Korean is a tonally demarcated unit which can contain more than one lexical item. It only has phrasal tones that are not specific to its component words but are a property of the phrase. Thus, the AP is a lower level of phrase than the IP, but is higher than the phonological word.

The underlying tonal pattern of the AP in Seoul Korean is assumed to be either /LHLH/ or /HHLH/ depending on a laryngeal feature, [stiff vocal cords] (Halle & Stevens 1971) of the AP initial segment (Jun 1996). However, only the former will be discussed in this paper. The first tone L in the underlying AP tones /LHLH/ is realised on the first syllable of the AP. The second tone H and the third tone L in /LHLH/ are optionally realised when there are three or more syllables in the AP (or phonetically undershot when there are two or fewer syllables in the AP). The second tone H is mostly realised on the second syllable of the AP, but can also be realised near the offset of the first syllable or the third syllable of the AP. The third tone L is realised on the penultimate syllable of the AP. The final tone H in /LHLH/ is realised on the final syllable of the AP, but if the AP is IP-final, the final H tone is overridden by the IP boundary tone following the 'Strict Layer Hypothesis' (Selkirk 1984; Nespor & Vogel 1986; Hayes 1989). That is, if an IP has a HL% boundary tone, the final H of the IP-final AP would not be

realised, but replaced with HL%. Thus, the surface tonal pattern of the AP would be [LHL HL%] ('%' after 'H' or 'L' means IP boundary tone) unless there is any phonetic undershooting.

According to Jun (1996; 1998), the tonal pattern of an AP in Korean is very sensitive to the number of syllables in the AP. If an AP has three or fewer syllables, its tonal pattern loses one or two tones due to phonetic undershoot.

2. PROCEDURE

Four native Seoul speakers in their mid twenties to mid thirties participated (two females – F1 and F2 – and two males – M1 and M2). Eight sentences consisting of one object noun followed by one verb (Korean is a verb final language) were prepared, both noun and verb containing different numbers of syllables. This was to investigate the way the F0 distributed over constituents with different numbers of syllables. Each sentence was produced as an answer to a question (/mwə hejo/, What are you doing?), and repeated five times using randomised cards (the sentences used are listed in Table 1). The utterances were digitised at 10 KHz, and further analysed with C(omputerised) S(peech) L(aboratory). Each sentence was segmented using a wideband (146Hz) spectrogram and an audio wave. Then, an F0 trace was produced with a frame length of 25msec. and frame advancements of 5 msec. and aligned with the spectrogram. F0 values were then sampled as a function of the segmental structure. F0 values of each sentence were, first, sampled at local maxima and minima (peaks and dips). In addition, F0 was sampled in those segments where F0 did not have a local maximum/minimum. This fairly high sampling rate was used to get a good idea of the details of the F0 time course.

Table 1. Corpus A, B, C, and D represent sentences with 1, 2, 3, and 4 syllable verbs respectively.

	Sentences	Meanings
A	/namu pe/ tree cut	'(I'm) cutting down the tree'
B	/uju mək-i-ə/ ([mək-jə]) milk eat-Caus.-INF	'(I'm) feeding (the baby) some milk'
	/namu pe-jo/ tree cut-polite	'(I'm) cutting down the tree' Polite
	/toŋmun-til manna/ alumnus-pl. meet	'(I'm) meeting some alumni'
C	/uju mək-i-ə-jo/ ([mək-jə-jo]) milk eat-Caus.-INF-polite	'(I'm) feeding (the baby) some milk' Polite
	/uju mantil-ə/ milk make-INF	'(I'm) making some milk (for baby)'
	/toŋmun-til manna-jo/ alumnus-pl. meet-polite	'(I'm) meeting some alumni' Polite
D	/uju mantil-ə-jo/ milk make-INF-polite	'(I'm) making some milk (for baby)' Polite

3. RESULTS AND DISCUSSION

The results showed that, perhaps not surprisingly, there was not a simple correlation between the declarative sentence type and a single IP boundary tone type. Five boundary tone types – HL%, H%, LHL%, HL%, L% (L% can be realised as fall or as low level) – were observed in the declarative. The results also showed that the AP structure is a more consistent cue in distinguishing sentence types.

3.1. Boundary Tones of the Declarative

The inventory and percent incidence of boundary tones in the declarative sentence type are shown in Table 2. As mentioned above, L% can be realised as fall or low level. For convenience, L% realised as fall is labelled as L% (F), and L% realised as low level is labelled as L% (L) in Table 2. Each boundary tone type is determined by the F0 shape of the sentence-final syllable. For example, distinction

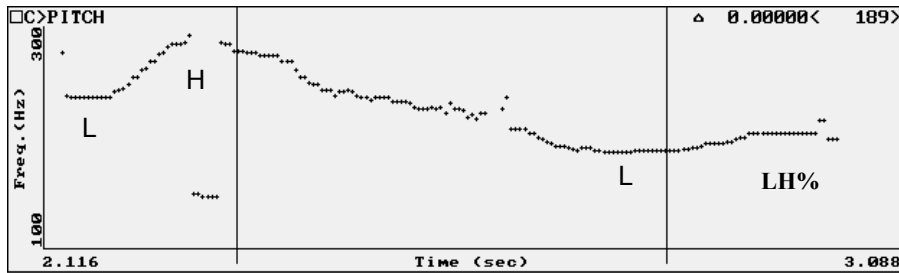
between LH% and H% is determined by the presence of a low plateau at the beginning of the final syllable of the sentence, and the same criterion is used for the distinction between LHL% and HL%. The actual F0 contours of each boundary tone presented in Table 2 are shown in Figure 1.

Table 2. Inventory and percent incidence of boundary tones in the declarative sentence type for each speaker.

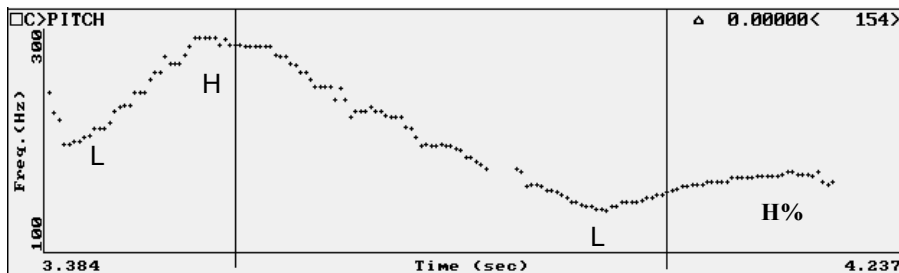
	LH%	H%	LHL%	HL%	L% (F)	L% (L)
F1	7.5%	5%	35%	5%	5%	42.5%
F2	67.5%		27.5%			5%
M1	20%		80%			
M2	27.5%		10%		12.5%	50%

Table 2 shows that different speakers have different tendencies in choosing a boundary tone. Speaker F1 shows an equally strong tendency towards LHL% (35%) and L% (L) (42.5%), F2 shows a strong tendency towards LH% (67.5%). Speaker M1 shows a very strong tendency towards LHL% (80%), and M2 said 50% of declarative sentence with L% (L) and 27.5% with LH%. These results, thus, appear to contradict the received views that declarative sentence type has a falling terminal pitch/F0 contour. Only two speakers, F1 and M2, show 5% and 12.5% of the declarative sentences with a falling contour.

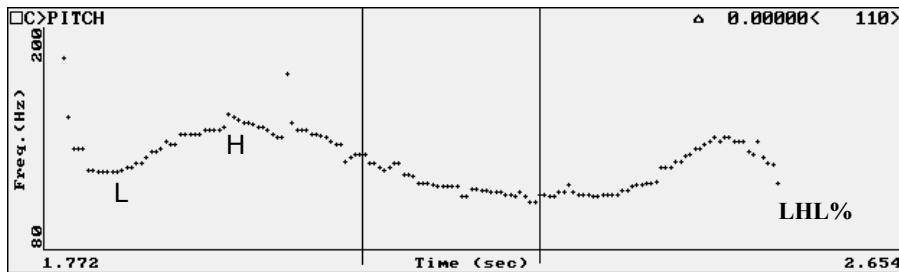
(a)



(b)



(c)



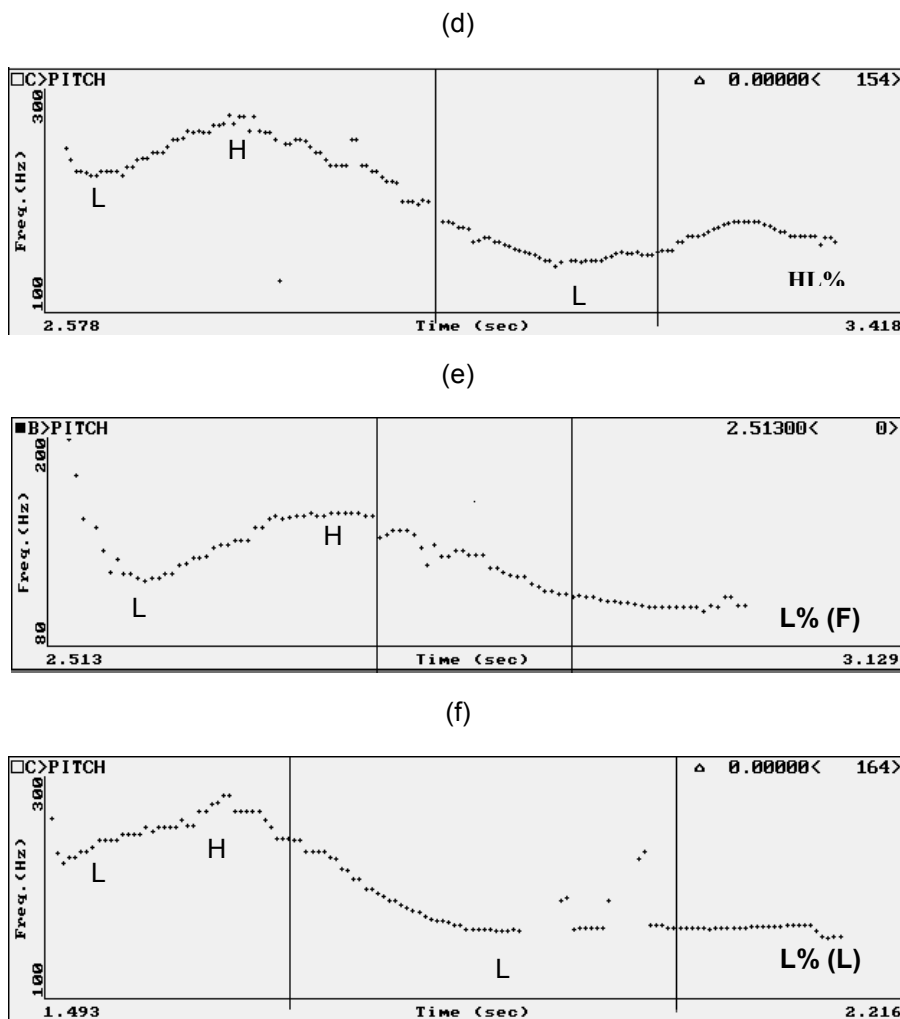


Figure 1. Sample F0 traces of declarative sentences with different boundary tones: (a) and (b) LH% and H% boundary tones /uju mantiləjɔl/ (*I'm making milk (for baby)*) in polite speech level, (c) and (d) LHL% and HL% boundary tones /toɯmuntɨl manna/ (*I'm meeting some alumni*), (e) L% (F) boundary tone /namu pejɔl/ (*I'm cutting down the tree*) in polite speech level, and (f) L% (L) boundary tone /uju mantilə/ (*I'm making some milk (for baby)*). The first vertical line marks the boundary between the noun and the verb, and the second vertical line marks the beginning of the final syllable. Female speakers are given a different F0 display range from male speakers (female: 100-300 Hz, male: 80-200 Hz).

3.2. Discussion

Even though the declarative sentence type shows six different realisations of boundary tone types (including L% (F) and L% (L)), it is uncertain whether all six are categorically different. Of the six, each pair of the following three pairs of boundary tone types – a pair of LH% and H%, a pair of LHL% and HL%, and a pair of L% (F) and L% (L) – seems to convey pragmatically very similar meaning, thus, each pair can be regarded as a suspicious pair. That is, there is a possibility that LH% (or LHL%) in a declarative sentence is derived from H% (or HL%) or vice versa. This is because it seems HL% (or LHL%) can be replaced with H% (or HL%) without changing the meaning of the sentence. It seems that whether the L tone in LH% or LHL% is realised on the final syllable or the penultimate syllable of the sentence does not affect meaning in the declarative sentence type. Also, L% (F) and L% (L) seem to be phonetic variants that convey the same meaning. A similar observation can be found in wh-question type. According to Jun and Oh (1996; 44), H% and LH% provide a similar pragmatic meaning in wh-question type in Korean (Lee H. Y. (2000; 2002) reports H% in a question can be acoustically and functionally distinguished from H% in a statement).

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Therefore, there seem to be at least three categorically different boundary tone types, and each pair mentioned above represents categorically different boundary tone type. Obviously, perceptual identification tests are required to find out if native Seoul speakers can perceptually and categorically identify each pair of boundary tones.

3.3. Accentual Phrase Structure of Declarative Sentences

In the declarative sentence type, all the sentences were produced in one AP by all four speakers. That is, all four speakers produced all the tokens of declarative in one AP for the object noun and the following verb: [Noun Verb]AP. On the other hand, according to Yim (2002), the verb of imperative sentence type tends to form a separate AP unless the noun is narrowly focused. It seems, therefore, the unmarked AP structure for the declarative is to form one AP for the object noun and the following verb, while the unmarked AP structure for the imperative is to form a separate AP for the verb.

Figure 2 shows a schematic representation of tonal realisation and AP structure of a sample declarative sentence with a two-syllable noun and a four-syllable verb, /u-ju man-til-ə-jo/ ('I'm) making some milk (for baby)', said with LH%. Since the noun and the verb form one AP, the sentence shows the first L in the underlying AP tones /LHLH/ on the first syllable /u-/, the second tone H in /LHLH/ on the second syllable /-ju-/. The third tone L in /LHLH/ is realised on the penultimate syllable /-ə-/, and the final H in /LHLH/ is realised on the final syllable /-jo/, but overridden by the IP boundary tone LH% (since the AP is the only and final AP of the IP). The third and the fourth syllables /man-til/ get their surface tones by interpolating between the second tone H and the third tone L resulting in a [[LHL LH%]AP]IP surface tonal pattern.

If the sentence formed a separate AP for the verb, it would show a [[LH]AP [LHL LH%]AP]IP surface tonal pattern. In the noun, only L and H in /LHLH/ would be realised on the surface since there are only two syllables in the AP (HL in /LHLH/ are phonetically undershot). In the verb, all the underlying AP tones would be realised, except for the final H, which is overridden by IP boundary tone LH% (since the verb is the IP final AP), since there are four syllables in the AP.

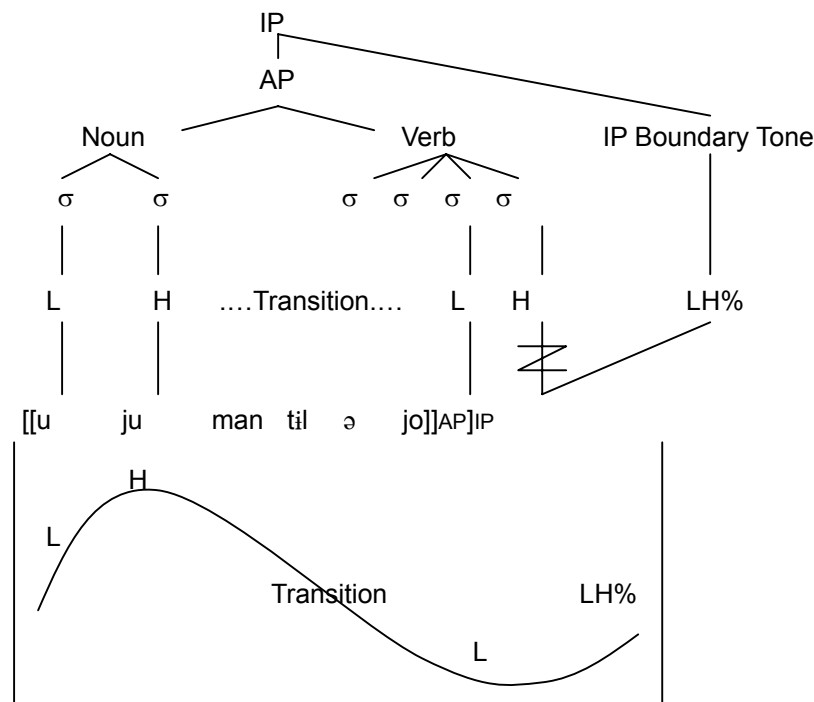


Figure 2. Schematic representation of tonal realisation and AP structure (above) and its typical F0 contour (below) of a sample sentence with a two-syllable noun and a four-syllable verb, /uju mantiləjo/ ('I'm) making some milk (for baby)', said in the declarative.

4. CONCLUSION

This paper has shown that the declarative can have six different realisations of boundary tone types. Tendency towards a certain boundary tone type differs from speaker to speaker, but only two speakers show a falling terminal pitch/F₀ contour with 5% and 12.5% for each speaker. This finding, therefore, challenges claims that declarative mostly shows a falling pitch/F₀ contour at the end of the sentence. Further, it has been observed that the declarative forms one AP for the object noun and the following verb. Following Yim's (2002) observation that the imperative tends to form a separate AP for the verb, the AP structure of the declarative observed in this paper suggests that at least two sentence types – declarative and imperative – can be distinguished by their AP structure, contrary to the received views that the two morphosyntactically equivalent sentence types are distinguishable only by contextual cues.

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