

Native Influence on the Production of English Intonation

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ABSTRACT

Language transfer means that the speaker's first language or previously acquired language influences on the production of the target language. This study aims at examining if there is native language influence on the production of English intonation by Korean speakers. The pitch accent patterns and the values of duration, F0, and intensity of the stressed vowel of the word with emphatic accent in the sentence produced by Korean speakers are compared to those of American English speakers. The results show that when the word receives emphatic accent in the sentence, American English speakers put H* accent on the stressed syllable of the word, but Korean speakers mostly assign high pitch on the last syllable of the word and have LH tonal pattern despite the fact that primary stress does not come on the last syllable within a word. In addition, comparison of the values of duration, F0, and intensity of the stressed vowel of the word with emphatic accent to those of the word with unmarked neutral accent shows that Korean speakers do not realize the intonation of the accented word appropriately because the values decrease even though the word has emphatic accent. This study finds out that there are differences in the production of English intonation of the word with emphatic accent between native speakers of English and Korean speakers, and that there is negative transfer of Korean intonation pattern to the production of English intonation by Korean speakers.

Keywords: language transfer, pitch accent, duration, F0, intensity

1. Introduction

When nonnative speakers learn a second language or a foreign language, their early acquired language, usually their mother tongue, influences pronunciation or phonology in L2. That phenomenon is explained by language transfer. McGory (1997, p. 1) states that language transfer refers to "the influence of a speaker's native language on the processes involved in the production and perception of a second language." Odlin (1989, p. 27) defines language transfer as "the influence resulting from similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired," and it is

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divided into positive transfer (facilitation) and negative transfer (interference). The distinction between positive transfer and negative transfer is based on the output (Gass & Selinker, 2001). When there exist the same linguistic elements between the first language and the second language, language transfer facilitates the acquisition of the second language. However, when there are differences between them, interference or negative transfer occurs. For example, because Korean phonological system does not have the retroflex [ɻ], Koreans often substitute it for the lateral approximant [l] or the tap (or flap) [ɾ] existing in Korean sounds. Thus, nonnative speakers can have foreign accents due to the different phonetic systems between their mother tongue and the target language. Some studies examine the interference of native language in the production of individual sounds in foreign language (Flege, 1987; Flege & Eefting, 1987). Negative transfer occurs in producing not only similar sounds but also different sounds.

According to Pierrehumbert (1980), Beckman and Pierrehumbert (1986), and Pierrehumbert and Hirschberg (1990), in English, intonational phrases (IP) are composed of one or more intermediate phrases (ip), and the intermediate phrase and the intonational phrase are associated with tune. An intermediate phrase consists of one or more pitch accents with a simple high (H) or low (L) tone, and the primary stressed syllable in the accented word receives H* or L* accent. Thus, there are six pitch accent patterns in English such as H*, L*, H*+L, H+L*, L*+H, and L+H*.

Jun (1993) proposes that the intonational structure of Seoul Korean is hierarchical, and that Korean intonation consists of Intonation Phrase (IP), Accentual Phrase (AP) and Word. AP is a smaller phrase within an IP, and it can include more than one Word. She suggests that the tonal pattern of AP is either LHLH or HHLH. When the initial segment is aspirated or tense, the initial tone of AP is H, and in other cases the initial tone of AP is L. AP is important in Korean intonation system, and an Accentual Phrase has two to five syllables. When the Accentual Phrase has less than four syllables, the second and the third tones may not be realized. Thus, LH pattern is the essential in Korean intonation (Jun, 1995).

According to McGory (1997), Korean speakers' L1 intonation system influences the production of English intonation. She states that "Korean is a non-stress language with phrase accents while English is a stress language with pitch accents" (p. 8). In English and Korean systems, fundamental frequency is used to distinguish a less prominent words from prominent words as an acoustic parameter. In English, fundamental frequency, duration, and intensity are associated with stress, and they all play an important role in intonation. However, because Korean is not a stress language, duration and intensity play a lesser role in prominence than in English. This study shows that even though Korean speakers produce rising pitch accents with longer duration in stressed syllables, they do not reduce unstressed syllables.

Kim and Kim (1999) find that Korean speakers have different intonation patterns from those

of native speakers when they produce English intonation. While native speakers of English put High pitch accent on the stressed syllable of the word in focus in the declarative sentence, Korean speakers tend to assign the pitch accent on the last syllable of a word. They claim that Korean speakers have accentual phrase patterns in English intonation rather than intermediate phrase patterns, and that the Low-High-Low-High tonal pattern of Korean intonation influences the realization of English intonation.

Koo's (1991) study also finds that English intonation patterns produced by Korean speakers are different from those of native speakers of English. Korean speakers produce the beginning of English sentence with rising tone regardless of the kind of the sentence, and they have S-shaped (rising) intonation melody. This study shows that Korean speakers are influenced by the tonal pattern of Korean when they produce English intonation.

In Um's (2004) study, while Korean speakers use phrase or boundary tones well, they have difficulty in assigning pitch accent of English appropriately in order to indicate new information or contrast. Native speakers of English assign High pitch accent on the focused word with new information, but Korean speakers put High pitch accent on the different word within the same phrase.

The above studies show the negative transfer from Korean intonation to English intonation of the sentence beginning or of the word in focus or with new information or contrast. This study purposes to find out if Korean speakers assign pitch accent appropriately on the stressed syllable of the English word with emphatic accent and they realize English intonation properly, or if the F0 configuration of the emphatic accented word in English sentence is affected by the tonal pattern of Korean, that is, if there is negative transfer of Korean intonation pattern to the production of emphatic accented word in English sentence. For this study part of materials and figures used in Kim (2007b) are reanalyzed. The pitch accent patterns, and the values of duration, F0, and intensity of the stressed vowel of the accented word produced by Korean speakers are compared to those of American English speakers. This study examines the difference of intonation patterns between American English speakers and Korean speakers and investigates the influence of Korean intonation pattern on the production of English intonation by Korean speakers.

2. Experiment

2.1 Subjects

Five native speakers of English and ten Koreans participated in this experiment. Native speakers of English are all from the U. S., and teach at public middle schools and elementary schools in Suwon and Hwaseong, Gyeonggi-do. Their ages range from 30 to 57, and have lived in Korea for one year except one subject who has lived in Korea for about five years. Ten

Koreans are senior students at TJ High School in Suwon. They belong to top thirty percent in English tests during the last school year. They have grown up in Kyeonggi-do and do not have any experience to have lived in English speaking countries.

2.2 Materials and Procedures

The material sentences used in Kim (2007b) are reanalyzed for this study. In the sentence (1), the words *mother*, *remembered*, and *address* have unmarked neutral accent, and in the sentences from (2a) to (2c), the words *mother*, *remembered*, and *address* have emphatic accent, respectively. Each underlined word in (1) is compared to the same word in (2a), (2b), and (2c), respectively. The analyzed words consist of more than two syllables, and begin with a vowel or a voiced consonant in order to decrease the influence of the surrounding sound because voiceless consonants can cause the pitch of the vowel of the word to increase (Chun, 2002). The words *mother* and *address* receive primary stress on the first syllable, and the word *remembered* has it on the second syllable. Because it is possible to put primary stress on the second syllable of the word *address*, in this study subjects were asked to pronounce it with primary stress on the first syllable.

- (1) My mother remembered his address exactly.
 (2a) (Was it your father who memorized his address exactly?)
 (No. It was my mother who remembered his address exactly.)
 My **mother** remembered his address exactly.
 (2b) (Did your mother forget his address?)
 (No. My mother did not forget his address but remembered it exactly.)
 My mother **remembered** his address exactly.
 (2c) (Was it his name that your mother remembered exactly?)
 (No. It was his address that my mother remembered exactly.)
 My mother remembered his **address** exactly.

In order to derive the emphatic accent on the given word, related questions and answers were presented in the parenthesis of (2a-c). After subjects had time to understand the context, they read each sentence with emphatic accented word, which has the same meaning as the answer in the second parentheses. Subjects read the above sentences three times and the best one of them was selected and analyzed. Recording and analyzing were performed with Pitch Works (Version 6.4 by Scicon R&D). After the sentences were recorded, the accented words were analyzed in terms of pitch accent patterns first. Then, duration, F0, and intensity of the stressed vowel of the accented word produced by Korean speakers of English and American English speakers were analyzed. The data comparing duration, F0, and intensity of the stressed vowel were statistically analyzed through the *t*-tests with SPSS (Version 12.0).

3. Results and Discussion

The F0 configurations of the sentence (1) with unmarked neutral accent and the sentences from (2a) to (2c) with emphatic accent on the words *mother*, *remembered*, and *address* produced by American English speakers and Korean speakers are shown in the <Figure 1> and <Figure 2>. Each figure consists of four configurations, in which the first one shows the F0 configuration of the sentence (1) with unmarked neutral accent, and the second, third, and fourth ones show the F0 contours of the sentences (2a), (2b), and (2c) with emphatic accent, respectively.

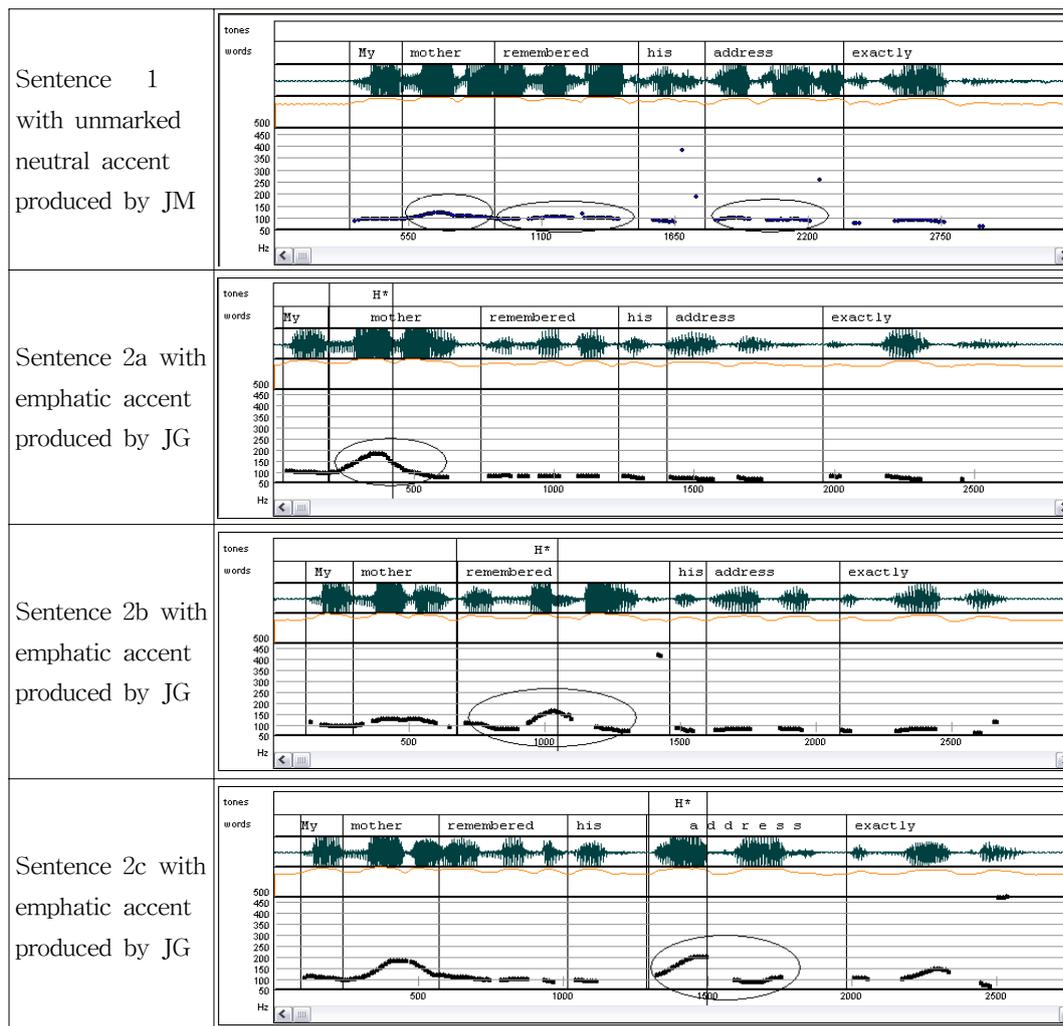


Figure 1. Pitch configurations of sentences 1 and 2(a, b, c) by Americans

The F0 configurations in <Figure 1> are sample contours produced by two among five American subjects. The first and the fourth pitch configurations among them are reprinted from Kim (2007b, p. 65 & p. 67). The words *mother*, *remembered*, and *address* that receive unmarked neutral accent or emphatic accent in each sentence are shown within the circle in the above F0 configurations.

When the words have emphatic accent, including the subject JG shown in <Figure 1>, American English speakers assign H* pitch accent on the stressed syllable of the words. So each emphatic accented word is distinguished from the word with unmarked neutral accent. In all the other pitch configurations that are not shown here, each subject has similar pitch accent pattern to the one shown in this figure even though each subject has different F0 value of the stressed syllable of the accented words.

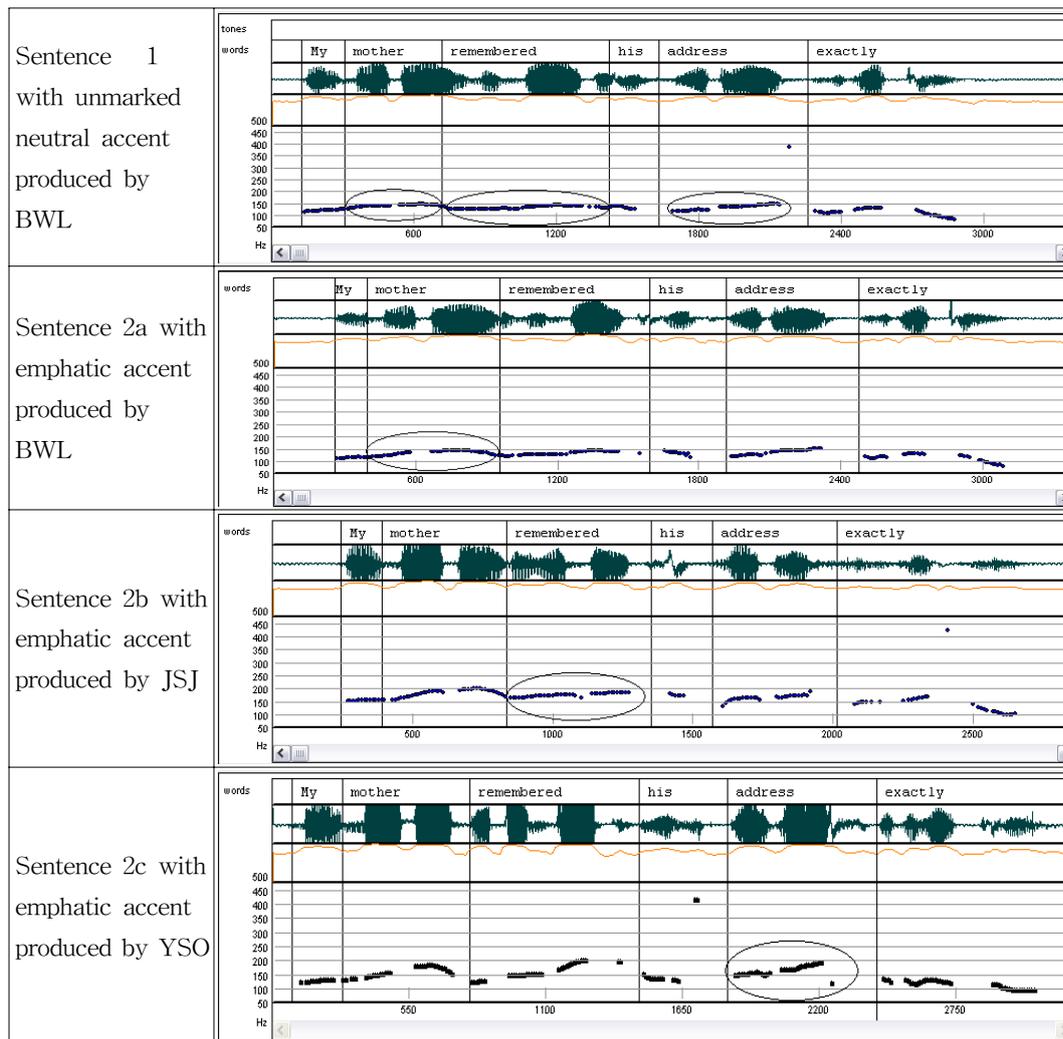


Figure 2. Pitch configurations of sentences 1 and 2(a, b, c) by Korean speakers

<Figure 2> presents the sample F0 configurations produced by three from ten Korean subjects and compares pitch contours produced by different subjects. Even though three words have emphatic accent in the sentences from (2a) to (2c), their pitch patterns are similar to the ones in the sentence (1) with unmarked neutral accent. The words *mother* and *address* have primary stress on the first syllable, and the word *remembered* receives primary stress on the second syllable. Thus, when they have emphatic accent, while American English speakers assign H* pitch accent on the stressed syllable of the accented word as shown in <Figure 1>, Korean speakers do not assign H* pitch accent on the stressed syllable of the accented word but put high pitch on the last syllable of the accented word. Thus, the accented words have LH pitch pattern regardless of the position of the stressed syllable in the word. That is, in the word the first syllable has low pitch and the last syllable has high pitch. The pitch contours of the accented word is similar to the ones of the other words without an accent in the same sentence as well as the ones of the words with unmarked neutral accent shown in the first configuration. Eventually, except some subjects, Korean speakers have the same pitch patterns of the words whether the word is accented or not. It implies that Koreans do not distinguish emphatic accent from unmarked neutral accent in the realization of intonation.

How Korean speakers realize English intonation of the accented word concretely is shown in the following <Figure 3>. It shows the percentage of pitch accent patterns of the words with emphatic accent in the sentences from (2a) to (2c) based on all the pitch configurations including the ones in <Figure 2> produced by ten Korean subjects.

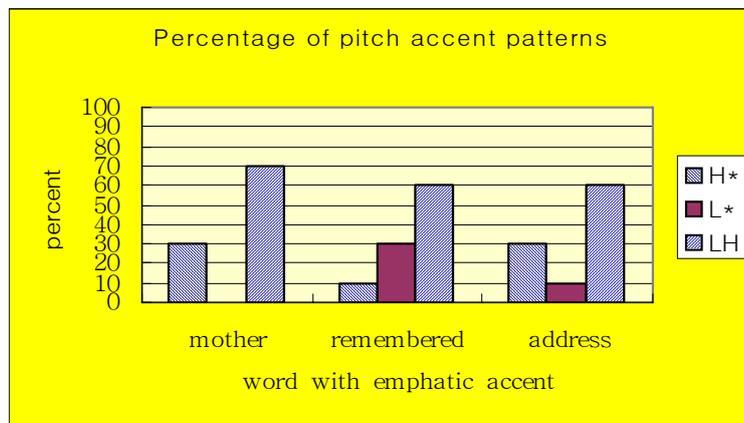


Figure 3. Percentage of pitch accent patterns of accented word by Korean speakers

The pitch accent patterns of the three words produced by ten Korean subjects are H*, L*, and LH. When the subjects produced the word with high pitch accent or low pitch accent on the stressed syllable of the word, I marked it H* or L*. But when they did not assign H*

accent or L* accent on the stressed syllable and the pitch contour of the accented word begins from low position and goes up high position with the high pitch on the last syllable even though the primary stress does not fall on the last syllable, I marked LH. In the case of the word *mother* in the sentence (2a), H* accent assigned on the stressed first syllable is 30% and the other 70% shows LH tonal sequence. It does not have any L* accent. The distributions of pitch accent patterns on the word *remembered* are as follows: H* accent assigned on the stressed second syllable is 10%; L* accent is 30%; LH contour is 60%. In this case, some Koreans produced the word *remembered* with low pitch, and did not distinguish emphatic accent from unmarked neutral accent. For the word *address* in the sentence (2c), the percentage of H* accent assigned on the stressed first syllable is 30% and L* accent assigned is 10%. The other 60% shows LH tonal pattern.

English intonation is realized by rapid increase of pitch but Korean intonation is realized by LH tonal pattern of AP (Jun, 1993). Kim et al. (2002) point out that Koreans realize different English intonation from native speakers of English because they do not know the difference between English intonation system and Korean intonation system. However, in this study, as <Figure 2> and <Figure 3> show, Korean speakers produce the words with unmarked neutral accent or emphatic accent in the English sentence with LH tonal pattern instead of assigning H* pitch accent on the stressed syllable of the word, and this is regarded as negative transfer from Korean intonation system to the production of English intonation. I think this is a similar phenomenon to the study by Kim and Kim (1999) that Korean speakers have accentual phrase patterns in English intonation, and that the LHLH tonal pattern of Korean intonation influences the realization of English intonation.

The following two tables compare the values of duration, F0, and intensity of the stressed vowel of the words with unmarked neutral accent to those of the words with emphatic accent produced by five American English speakers and ten Korean speakers. These two tables are reconstructed from the tables used in Kim (2007b). The following tables show the difference in the production of the accented words between Korean speakers from native speakers of English.

Table 1. The values of duration, F0, and intensity by American English speakers

Americans		accent	average	s. d.	<i>t</i> -value	<i>p</i> -value
mother	duration (ms)	neutral	112.40	6.58	4.797	0.001*
		emphatic	133.20	7.12		
	F0 (Hz)	neutral	157.00	25.12	1.383	0.204
		emphatic	183.00	33.70		
	intensity (dB)	neutral	85.20	1.30	1.213	0.260
		emphatic	86.20	1.30		
remembered	duration (ms)	neutral	94.40	1.34	2.808	0.023*
		emphatic	111.20	13.31		
	F0 (Hz)	neutral	130.80	29.76	2.310	0.050
		emphatic	180.00	43.22		
	intensity (dB)	neutral	81.40	1.67	1.281	0.236
		emphatic	83.00	2.24		
address	duration	neutral	163.40	27.17	2.883	0.020*
		emphatic	204.20	16.22		
	F0	neutral	128.20	13.03	2.277	0.052
		emphatic	165.40	34.14		
	intensity	neutral	80.40	2.70	3.300	0.011*
		emphatic	84.60	0.89		

* $p < 0.05$

According to <Table 1>, when the words *mother*, *remembered*, and *address* receive emphatic accent, duration of the stressed vowel of those words is longer than when they receive unmarked neutral accent, and the differences of duration are significant ($p=0.001$, 0.023 , and 0.020 , respectively). Even though F0 value differences between unmarked neutral accent and emphatic accent do not show the significance, the words *remembered* and *address* show such significant differences, $p=0.05$ and $p=0.052$ respectively. Thus, I assume that the differences are almost significant. American speakers produce three words with stronger intensity when they have emphatic accent than when they have unmarked neutral accent. The differences of intensity values of the stressed vowels of three words between unmarked neutral accent and emphatic accent show the significance. <Table 1> shows that American English speakers produce the words with longer duration, higher F0, and stronger intensity when the words receive emphatic accent than when they have unmarked neutral accent. Among them, especially duration and intensity features are used more than F0 feature to show the emphatic accent.

Table 2. The values of duration, F0, and intensity by Korean speakers

Koreans		accent	average	s. d.	<i>t</i> -value	<i>p</i> -value
mother	duration (ms)	neutral	116.50	13.34	0.235	0.818
		emphatic	118.25	16.29		
	F0 (Hz)	neutral	181.50	29.51	-1.122	0.281
		emphatic	167.38	19.91		
	intensity (dB)	neutral	84.25	2.25	-0.976	0.346
		emphatic	83.13	2.36		
remembered	duration (ms)	neutral	93.63	18.55	-0.299	0.770
		emphatic	91.00	16.56		
	F0 (Hz)	neutral	163.50	28.17	-1.372	0.192
		emphatic	145.50	24.17		
	intensity (dB)	neutral	78.50	4.24	-0.425	0.678
		emphatic	77.63	3.99		
address	duration (ms)	neutral	146.63	15.02	0.428	0.675
		emphatic	149.88	15.36		
	F0 (Hz)	neutral	166.00	25.71	-1.425	0.176
		emphatic	150.50	16.89		
	intensity (dB)	neutral	81.38	3.50	-0.664	0.518
		emphatic	80.13	4.02		

**p* < 0.05

<Table 2> shows the differences of the values of duration, F0, and intensity of the stressed vowels of three words produced by Korean speakers. Comparing three values of the stressed vowels of three words with emphatic accent to those with unmarked neutral accent, all the values decrease despite the fact that the words are accented, except for duration of the stressed vowel of the words *mother* and *address*. As shown in <Table 1>, American English speakers use three features to indicate emphatic accent on the words, so the values of duration, F0, and intensity increase when the words are accented. However, Korean speakers do not use those features. That is, although those intonation features should be used in order to differentiate emphatic accent from unmarked neutral accent, Korean speakers do not use specific intonation features appropriately to indicate the words with emphatic accent. Even though in the studies by McGory (1997) and Kim (2007a), Korean speakers use F0 feature to show English intonation or English sentence stress, in this study they only use the duration feature for some words, but not significantly. It is assumed that whether the subjects have experience to have spoken English with native speakers or not may cause the difference.

4. Conclusion

This study aims to find out if there is native language influence on the production of English intonation produced by Korean speakers. The result of comparison of pitch accent pattern on the words with emphatic accent to that of unmarked neutral accent produced by native speakers of English and Korean speakers show that native speakers of English produce the word with emphatic accent with H* pitch accent on the stressed syllable of the word, but that Korean speakers do not assign H* accent on the stressed syllable of the accented word properly. Instead, they mostly produce the accented word with LH tonal pattern, assigning high pitch on the last syllable although primary stress does not come on the last syllable. This is regarded as language transfer of LH tonal pattern of Korean intonation to English intonation. Comparison of the values of duration, F0, and intensity of the stressed vowel of the accented word also shows that while American English speakers use these three features to distinguish emphatic accent from unmarked neutral accent, Korean speakers do not use these acoustic features appropriately except for the duration feature for the words used as a subject and an object. As Kim (2007b) suggests, instruction will be necessary so that Korean speakers can produce English intonation properly without being influenced by native language intonation.

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