

Prosody Perception on Spontaneous English by Korean Learners of English and Native English Speakers

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The present study aims to look at whether Korean English learners' prosody perception differed from those of native English speakers on the spontaneous English speech. Findings from the study revealed that the Korean English learners significantly differed from the native English speakers in the judgment of prominence while there was no significant group difference in the judgment of boundaries. Among three groups of Korean English learners, the significant group difference was not found in the judgment of prominence and boundaries despite their different English speaking proficiency levels and lengths of residence. The word type (i.e., content word and function word) and boundaries (i.e., intermediate phrase and intonational phrase) appeared to play an important role on the perception of English prosody by the Korean English learners. Also, Korean L1 transfer seemed to have an effect on the perception of prominence and boundaries by the Korean subjects. The results of the study contribute to an understanding of Korean English learners' perception and of English prosody in a second language. Practical suggestions for future research were also identified.

Keywords: prosody, perception, spontaneous, English, Korean

1. Introduction

Prosody is a highlighting and a grouping of words within an utterance (S-A Jun 2005). It is composed of different sizes of prosodic units (e.g., syllables, foot, prosodic word, phonological phrase, intonational phrase) which are organized hierarchically by the function of highlighting and grouping of words (Y-S Mo 2010). The hierarchical or-

ganization of prosody is demonstrated in Figure 1 below.

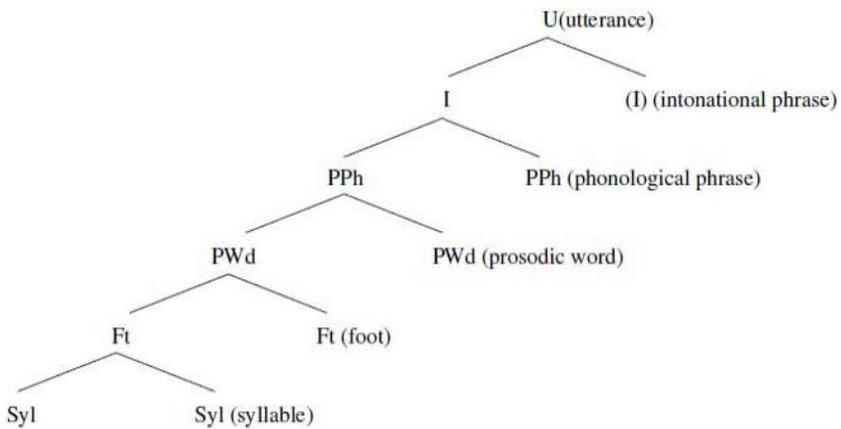


Figure 1. ARABIC 1 A schematic representation of the prosodic hierarchy (Y-S Mo 2010: 4). Different sizes of prosodic units are organized hierarchically in an utterance.

The highlighting of words among the members within an utterance is called stress, prominence (Y-S Mo 2010) or focal accent (S-A Jun 2005). This wide usage is due to the attention from various fields of study such as linguistics, language acquisition, and language learning and teaching. Although there is still no consensus among researchers, we are going to call it prominence in this paper. The prominence divides an utterance into several groups of words and creates a new arrangement among words, called boundaries. It reorganizes the sound structure in a phrase or a sentence through the reduction, assimilation, elision, cliticisation and resyllabification (Field 2003). This process is shown in (1) (Roach 2007: 135).

- (1) a. 'Walk 'down the 'path to the 'end of the ca 'nal
 b. 'Walk // 'down the // 'path to the // 'end of the ca // 'nal

This process is important to decode signals and comprehend the string of speech. For example, the case of 'end of the ca // 'nal in (1) may cause misunderstanding or communication breakdown if the listeners, who are non-native English speakers, have not yet acquired the English prosody (Brown & Kondo-Brown 2006; Field 2008; Flowerdew &

Miller 2005; Rost 1990), Therefore, the prominence and boundaries of English are critical to listen and understand the speech. Nevertheless, the English prosody has been stigmatized in current school textbooks and also, in teaching listening / speaking. Moreover, it has not been fully investigated in second language acquisition (SLA) compared to other segmental features of speech. Therefore, the perception of English prosody becomes an ideal choice for the study of SLA (Anderson-Hsieh, Johnson, & Koehler 1992; Bradlow, Torretta, & Pisoni 1996; Field 2003; Jenkins 2000; Munro & Derwing 2008).

There are other important variables to consider in the present study: word type, word boundary, English proficiency level, length of residence (LOR) and the spontaneous data. First, word type is a crucial factor to discuss the English prosody. In general, word types are categorized into two groups: content words (e.g., noun, adjective, verb and adverb) and function words (e.g., preposition, pronoun, auxiliary verb and conjunction). In English, most content words receive prominence while function words, except some of cases, do not. On the contrary, in Korean, function words are often highlighted due to the LHLH or HHLH tonal pattern (S-A Jun 2005) because the final Hs of both tonal patterns are function words (e.g., postpositional particles). Therefore, the different prosodic systems between two languages might lead Korean English learners to be confused of and also, not to consider the word types in English. In this regard, word type is a good variable to investigate the perception of English prominence and to see the L1 influence, which will result in the group difference between the native English group (NE) and the Korean groups.

Other variable for investigating the perception of prosody is boundaries: Intermediate Phrases (ip) and Intonational Phrases (IP). Ellis mentioned that English short speech (i.e., intonational phrase) contains words ranging from four to ten (Riggenbach 2000). Korean Accentual Phrase (ap), however, consists of four to six syllables (i.e., approximately, one word) (S-A Jun 2005) and might be shorter than English intermediate phrases and intonational phrases. Therefore, it is possible that Korean English learners perceive boundaries much shorter and perceive prominence more than native English speakers due to Korean L1 influence. Moreover, English contains more than one focal accent (i.e., prominence) in intermediate phrase while only one nuclear pitch accent (NPA, the most prominent focal accent) in intonational phrase

(S-A Jun 2005). Focal accents may situate at any position in the intermediate phrases while nuclear pitch accents mostly come to the final position of the intonational phrases. Compared to this, Korean has LHLH or HHLH tonal accents. Korean mostly begins with H tone due to edge prominence in accentual phrases (S-A Jun 2005) and finishes by H tone (H-Y Lee 1997) as mentioned before. Considering the similarities (i.e., H tone before ip boundary) and differences (i.e., H tone after ip boundary) between English and Korean, it is presumable that Korean English learners perceive prominence after ip boundaries due to L1 interference (i.e., edge prominence). In this regard, boundaries are important variables to examine the perception of English prosody and L1 Korean influence.

The perceptual ability is closely related with listeners' language backgrounds as well. A large number of researchers considered participants' English proficiency level as a variable of experiment in their studies (Flege 1995; Flege & Davidian 1984; S-A Jun 2005; Weingreich 1953). S-A Jun (2005) in her study investigated two groups of Korean English learners (i.e., intermediate group and beginner group) and found out a significant group difference. Also, the relationship between the perceptual ability and LOR in English speaking countries has been examined in the field of L2 acquisition (Bohn & Flege 1992; S-H Kang et al., 2012). Bohn and Flege (1992) examined two groups of English German learners with different LOR (i.e., 0.6 years for inexperienced group and 7.5 years for experienced group) and found out learners with longer living experience tended to be more sensitive to L2 sound. Above this, there is a wide range of variables to investigate L2 perception and acquisition but we will limit our scope to considering English proficiency level and LOR as variables for grouping participants.

Given the discussion above, the perception of English prosody by Korean English learners is an interesting topic for research in the spontaneous data. A few studies have investigated the perception of English prosody and most of them have focused on the word-level data: minimal pairs (Fry 1972; J-Y Kim 2011), nonsense words (S-H Kang 2011) or a couple of words in carrier sentences (e.g., J-Y Kim 2003; McGory 1997; Ueyama & S-A Jun 1997). Y-S Mo (2010) extended the scope by exploring the prosody perception in the conversational speech by expert and naïve native English speakers. However,

the study which deals with the perception of English prosody in the spontaneous data and also, the group difference between Korean English learners and native English speakers has not yet been found. Also, we knew little about the perceptual differences of English prosody among Korean English learners according to their different English proficiency level and LOR. Considering this, the present study would contribute to understanding the perception of English prosody and the group effects among native English speakers and Korean English learners in the spontaneous speech.

In the study, we will present a quantitative (and also, supportive qualitative) investigation of perception of English prosody by four groups of native English speakers and Korean speakers. We collected the data from the listening experiment with three native English participants (3 participants \times 1 group) and nine Korean participants whose English proficiency and LOR were different from each group (3 participants \times 3 groups). We will examine the distributions of perceived prominence: the overall distribution of perception of English prosody (i.e., prominence and boundaries) and the distribution of prominence, in particular, by word type and word boundary. Lastly, we will discuss the group differences to see if they are statistically significant by using ANOVA and Tukey HSD.

The research questions regarding the perception of English prosody are raised as follows:

Research question 1. Do Korean participants show similar perception over prominence and boundaries as native English speakers? If not, what do the differences tell us?

Research question 2. Do Korean participants show similar perception over prominence and boundaries according to participant's English proficiency and LOR? If not, what do the differences tell us?

To the research questions, we will try to suggest possible answers regarding the perceptual differences of English prosody in spontaneous English speech by the native English group and the Korean groups. In section 2, we will describe the methodology employed in this study. In section 3, we will present the results regarding the overall distribution and the group differences examined by ANOVA. In section 4, we will discuss the findings of the study: the group differences 1) between the native English group and the Korean groups and 2)

among the Korean groups. Finally, we will provide the conclusion, educational implications and limitations of the present study.

2. Methodology

2.1. Participants

The participants were twelve native English speakers and Korean speakers; three English speakers (male 1, female 2) were from North America and nine Korean speakers (male 0, female 9) were born and raised in Korea. The native English speakers were graduate students at Department of Linguistics at Seoul National University in Korea and took an English phonetics course during their undergraduate studies in North America. Korean students were undergraduate students at Department of English Education at Seoul National University and were taking *Applied English Phonetics* class. Their background information is outlined in Table 1.

Table 1. Participant's Background Information by Group

	NE ($n = 3$)	K1 ($n = 3$)	K2 ($n = 3$)	K3 ($n = 3$)
L1	English	Korean	Korean	Korean
Gender	male 1, female 2	male 0, female 3	male 0, female 3	male 0, female 3
Age (years)	$M = 26$	$M = 19.3$	$M = 20.7$	$M = 19.7$
LOR (years)	$M = 19.3$	$M = 0$	$M = 0$	$M = 1.6$
AOA (years)	$M = 2.2$	<i>N.A.</i>	<i>N.A.</i>	$M = 9$
TEPS	Native	689.7	889.7	909.7
TEPS Listening	Native	294	366.7	358
English Proficiency	Native	Intermediate	Advanced	Advanced

Note. The participants were four groups: 1 native English group (NE, $n = 3$) and 3 Korean English learner groups (K1-K3, $n = 3$ for each group). K1 is the intermediate group without living experience in English speaking countries. K2 is the advanced group without living experience and K3 is the advanced group with more than one year of living experience ($M = 1.6$).

The Korean participants were categorized into three groups based on the English proficiency level and the LOR in English speaking countries. K1 is the intermediate group with no experience of living in English speaking countries ($M = 0$). K2 is the advanced group with no experience of staying in English speaking countries ($M = 0$). K3 is the advanced group with more than one year of living experience in English speaking countries ($M = 1.6$). In order to judge participant's English proficiency level, *Tests of English Proficiency developed by Seoul National University* (TEPS), a widely accepted examination in Korea, was used as the criteria in grouping students into two different levels: intermediate level and advanced level. Also, TEPS listening scores were measured by group since the experiment investigates participants' perceptual ability. Figure 2 shows TEPS total scores and TEPS listening scores by Korean group. For each scores, there was a significant group difference between K1 (i.e., intermediate) and K2-K3 (i.e., advanced): for the TEPS total scores, $F(2,6) = 43.289$, $p < .05$ and for the TEPS listening scores, $F(2,6) = 5.899$, $p < .05$.

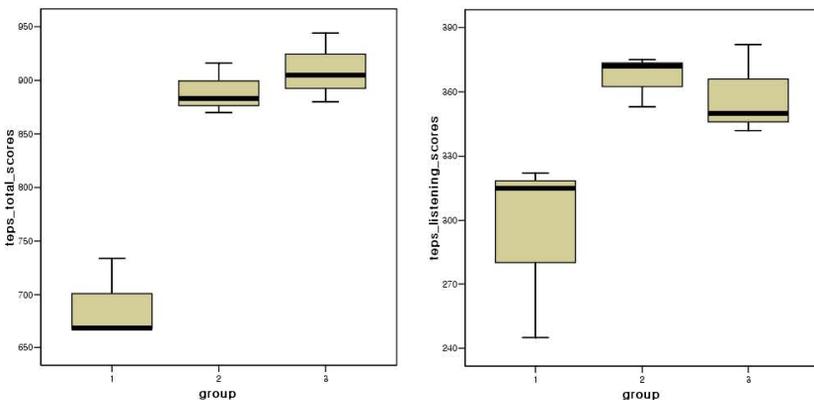


Figure 2. TEPS total scores and TEPS listening scores of Korean groups. For both scores, there was a significant group difference between K1 (i.e., intermediate) *versus* K2 and K3 (i.e., advanced).

2.2. Instruments

For the instrument, a spontaneous public speech was chosen as a material. It was a speech given by Matt Cutts, a Google engineer, titled *Try Something New for 30 Days* and downloaded at www.TED.com.

The speech took 2' 16" and contained 364 words ($M = 169$ words/min.). Considering that native American speakers produce 150 to 200 words per minute (Riggenbach 2000), Matt Cutts' speech was considered to be an exemplar of spontaneous speech with a clear articulation and a simple message. Y-S Mo (2010) used the spontaneous conversational speech from the Buckeye Corpus and tried to exceed the limit of inquiry to laboratory speech or carefully designed speech in her previous study. Considering this, the present study also attempted to broaden the scope of perceptual studies with a spontaneous public speech.

The script of Matt Cutts' public speech was also downloaded at www.TED.com and prepared for the experiment. All punctuation marks were eliminated and capital letters were changed into small letters as in (2).

- (2) a few years ago i felt like i was stuck in a rut so i decided to follow in the footsteps of the great american philosopher morgan spurlock and try something new for thirty days the idea is actually pretty simple think about something you've always wanted to add to your life and try it for the next thirty days (...)

This was because punctuation marks and capital letters have a function of indicating the beginning or the end of sentences (Y-S Mo 2010). It was possible that these two indicators might influence participants' judgment on prominence and boundaries. As our aim was to measure participants' real-time perceptual ability, punctuation marks and capital letters were removed to ensure the credibility of experiment.

2.3. Data collection

Data collection was conducted in four stages. Each stage is outlined in Table 2.

Table 2. Four Stages of Data Collection

Stage 1 (5 minutes)	Stage 2 (5 minutes)	Stage 3 (15 minutes)	Stage 4 (5 minutes)
The researcher informed the purpose and the scheme of experiment.	Participants filled in a personal survey.	Participants marked prominence and boundaries while they were listening.	Participants wrote comments about the experiment.

For Stage 1 (5 minutes), the basic information for the experiment was presented. The researcher explained the purpose of experiment, guaranteed the confidentiality of given information and defined the prominence and boundaries with concrete examples. The definition and examples were given because each participant might have a different concept of prominence and boundaries. They were referred to a few well-recognized books in the field: *A course in Phonetics* (Ladefoged & Johnson 2010), *English Phonetics and Phonology* (Roach 2007) and *American Accent Training* (Cook 2000). The researcher also explained the scheme of marking (Y-S Mo 2010) and briefly introduced the speaker and the content of audio clip. For Stage 2 (5 minutes), participants filled in a survey of personal information: name, age, gender, native country, native language, living experience in English speaking countries and TEPS scores (see Appendix A). For Stage 3 (15 minutes), participants received the script of audio clip (see Appendix B) and marked prominence and boundaries on the script while they were listening as in (3).

- (3) a few years ago | i felt like i was stuck | in a rut | so i decided to follow in the footsteps of the great american philosopher | morgan spurlock | and try something new for thirty days | the idea is actually pretty simple | think about something you've always wanted to add to your life | and try it | for the next thirty days | it turns out | thirty days is just about the right amount of time to add a

The participants did not have the preparation time and listened to the audio clip five times. For each time, they marked one of prosodies as in Table 3.

Table 3. Steps of Perception Experiment Stage 3

Time	Required Task	Marking Color
1	Prominence marking	Black
2	Boundary marking	Black
3	Prominence marking	Blue
4	Boundary marking	Blue
5	Prominence and boundary marking	Red

This was to allow participants to have enough time to mark prominence or boundaries as they listen. Most of participants were non-native speakers of English and might have been overwhelmed by the speed of speech and the required tasks of experiment. Y-S Mo (2010) in her study conducted a similar perception task and played the same audio-clip twice. Although the purpose of her study was to investigate the real-time perception of prosody and the participants were all native English speakers, participants had to listen a couple of times due to the speed of audio-clip. Considering Y-S Mo's study (2010) and the characteristic of participants of the present study (i.e., English non-native speakers), it was ideal to allow participants to listen to the audio clip several times and ensure the consistency of experiment. In order to keep track on each step, different color pens were used and this was not considered for the analysis of experiment. Finally, for Stage 4 (5 minutes), participants wrote comments about the experiment as in (4). All the stages were held during 30 minutes in a quiet classroom at the university.

(4) prominence 를 찾으려고 하다보니 나중에 어느 부분이 더 stressed 된 것인지 헷갈리게 시작했다.

어떤 문장에서는 상대적으로 prominent 하다고 느껴졌던 정도가 다른 문장에서는 아니어서 헷갈렸다.

2.4. Data Coding and Analysis

For the data coding, the data were coded into 0 and 1; 0 was to indicate no-mark while 1 was to indicate the marking on the word. All the data (i.e., 364 words) were tallied separately for individual participants, and for prominence and boundary marking (i.e., 364 words × 12 persons × 2 markings). For the data analysis, the researcher calculated the frequency and the mean of prominence and boundary markings following the formula below:

$$(5) \text{ Mean} = \frac{\text{(Sum of prosodic markings for each word)}}{\text{(Total no. of participants by group)}}$$

The frequency and the mean of prominence and boundary markings were presented by bar graphs, line graphs and box plots. The line graphs were adopted in Y-S Mo's (2010) study to demonstrate the result of prosody perception for each word.

In order to consider the distribution of prominence by word type, the researcher categorized all words into two groups: content word and function word. For the content words, 4 grammatical word categories, noun, verb, adjective and adverb, were considered while for the function words, all other grammatical word categories, except four categories aforementioned, were included. In order to consider the distribution of prominence by word boundary, the researcher divided each sentence into two groups: intermediate phrase and intonational phrase. For both cases, 3 grammatical categories, NP, PP, AP, were considered (H-Y Lee 1997). They are possibly different from prosodic boundaries but in our data, there was no serious mismatch between grammatical categories and prosodic boundaries.

In order to consider the group differences, a one-way balanced ANOVA and Post-Hoc test (i.e., Tukey HSD test) were used (Hatch & Lazaraton 1991). The 0.5 level was set to reject the null hypothesis. The one-way ANOVA recommends to having more than 30 samples for each level (S-M Woo 2007), but the present study did not meet the condition (i.e., 12 samples in total). Finally, in order to supplement quantitative analysis, written comments from participants were considered.

3. Results

In this section, the overall distribution of prominence and boundaries will be presented in section 3.1. Next, the perceived prominence according to two factors: word types and word boundaries will be discussed in section 3.2 and 3.3 respectively.

3.1. Overall Distribution

Figure 3a demonstrates the overall distribution of prominence and boundaries in the data. For the perceived prominence, the frequency is much higher in the Korean groups (K1-K3) than in the native English group. It is 55.33 in the native English group (NE) and exponentially increases to 98 in intermediate Korean group (K1) and slightly decreases to 95 in advanced Korean group without living experience (K2), then, jump into 116 in advanced Korean group with living experience (K3). The Korean groups perceived almost twice as much prominence ($M = 103$) as the native English group ($M = 55$). This is contradictory to the previous findings that Korean English learners are not sensitive to the word prominence due to the L1 interference (S-H Kang et al. 2012; J-Y Kim 2011; Ueyama & S-A Jun 1997). Figure 3b (left side) clearly shows the group differences in perceiving prominence. In order to determine between-group differences, the frequency of prominence was calculated by ANOVA. There was a significant group difference between the NE group and the Korean groups, $F(3, 8) = 20.221$, $p < .05$. The Korean groups, however, did not differ from each other despite their different language backgrounds (i.e., English proficiency level and LOR). This was supported by Post-hoc test; groups were divided into two groups only: the native English (NE) *versus* the Korean groups (K1-K3).

For the boundaries, the frequency is slightly higher in the Korean groups than the native English group. It is 74 in the NE group and maintains its level as 69 in the K1 group, 70 in the K2 group and 73 in the K3 group, respectively ($M = 70.67$). Figure 3b (right side) shows no between-group differences in perceiving boundaries. The comparison of frequency of boundary did not reveal a significant group effect, $F(3,8) = .267$. Post-hoc test also did not reach significance for any between-group comparison.

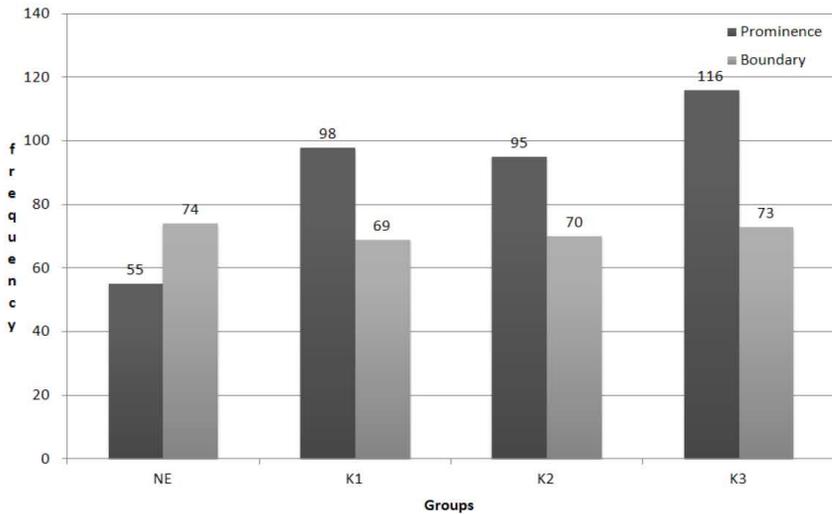


Figure 3a. Frequency of perceived prominence and boundaries. For the prominence (left bar), the Korean groups (K1-K3) perceived almost twice as much prominence ($M = 103$) as the native English group ($M = 55$). For the boundaries (right bar), the Korean groups ($M = 70.67$) and the native English group ($M = 74$) did not differ from each other.

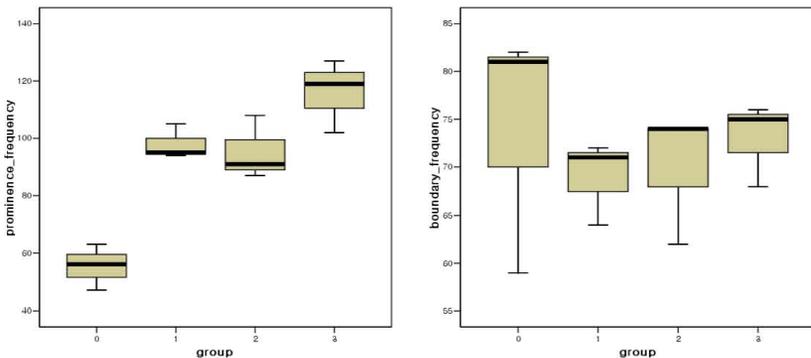


Figure 3b. Between-group differences of perceived prominence and boundaries. For the prominence (left side), there was a group difference between the NE group (0) and the Korean groups (1-3) while for the boundaries (right side), there was no significant difference among groups (0-4).

Figures 4 and 5 demonstrate the mean of prominence and boundary markings for each word. Figure 4 shows the mean of prominence marking for each word within a sentence: *think about something you've*

always wanted to add to your life and try it for the next thirty days.

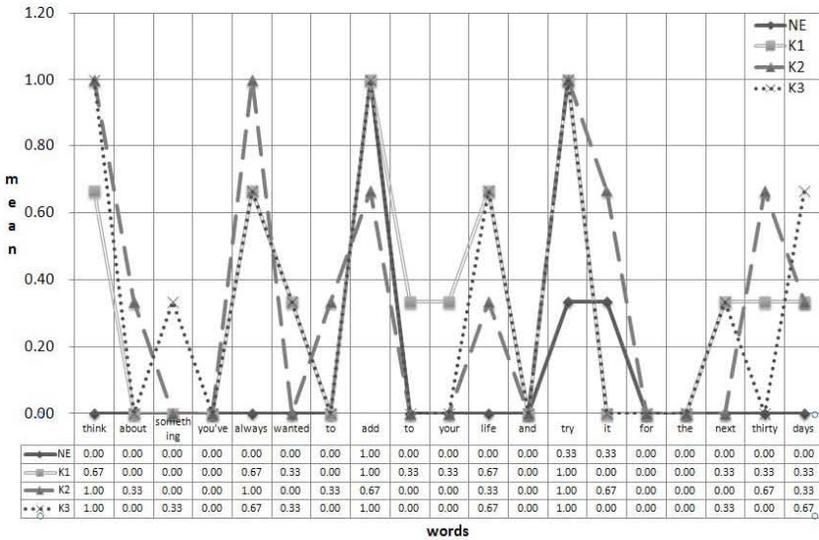


Figure 4. Mean of prominence marking for each word. There was a group difference between the NE group and the Korean groups (K1-K3). None of the NE group perceived prominence while all three Korean groups perceived prominence on the words: *think, always, life* and *days*.

In Figure 4, the mean is not unanimous across the groups and it is categorized into three cases, Same, Similar and Different cases, when comparing the mean of NE group and that of Korean groups. As shown in Table 4, of the 19 words, 4 words had the Same results between the NE group and the Korean groups (21%), 11 words had the Similar results (58%) and 4 words had the Different results (21%). The Different results between the NE group and the Korean groups are of note; none of the NE group perceived prominence while all three Korean groups perceived prominence on the words, *think, always, life* and *days*.

Table 4. Comparison of Prominence Marking for Each Word

Category	Word	Frequency	Percent
Same	<i>you've, and, for, the</i>	4	21
Similar	<i>about, something, wanted, to, add, to, your, try, it, next, thirty</i>	11	58
Different	<i>think, always, life, days</i>	4	21

Figure 5 demonstrates the mean of boundary marking for each word within a sentence: *i also noticed that as i started to do more and harder thirty-day challenges my self-confidence grew*. The mean is almost unanimous across the groups except few cases.

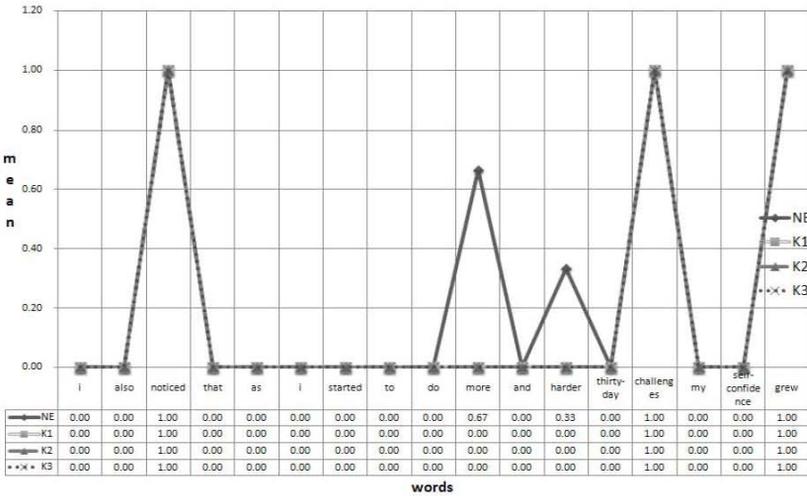


Figure 5. Mean of boundary marking for each word. In the case of *more*, there is a group difference between the NE group and the Korean groups (K1-K3). The NE group perceived a boundary after *more*, while none of the Korean groups perceived the boundary after it.

As shown in Table 5, of the 17 words, 15 words have the Same results between the NE group and the Korean groups (88%), 1 word has the Similar result (6%) and 1 word has the Different result (6%). The Different result is of interest; more than half of the NE group perceived a boundary after the word *more*, while none of the Korean groups perceived the boundary after it.

Table 5. Comparison of Boundary Marking for Each Word

Category	Word	Frequency	Percent
Same	<i>i, also, noticed, that, as, i, started, to, do, and, thirty-day, challenges, my, confidence, grew</i>	15	88
Similar	<i>harder</i>	1	6
Different	<i>more</i>	1	6

Although Figure 4, Figure 5, Table 4 and Table 5 show the results of two sentences extracted from the data, they confirm the findings aforementioned that 1) there is a group difference between the native English group and the Korean groups, and 2) the Korean groups demonstrate similar results of prosody perception despite their different language backgrounds.

3.2. Distribution by Word Type

More observation in the prominence marking suggests that Koreans are sensitive to prominence perception. Figure 6 shows the distribution of prominence by word type: content word and function word.

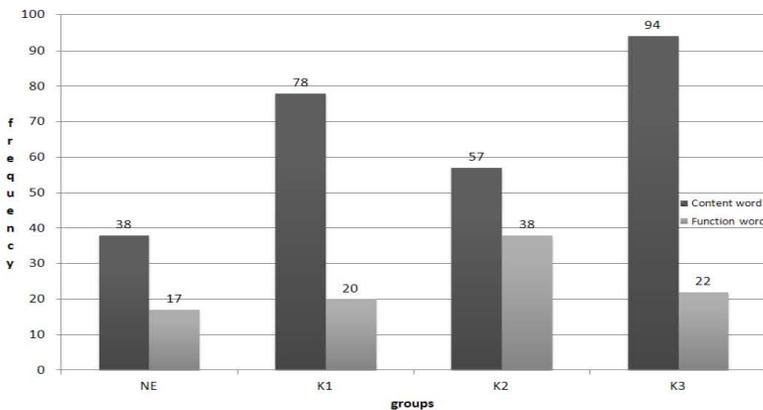


Figure 6. Distribution of prominence by content words and function words. For the content word (left bar), the Korean groups (K1-K3) perceived nearly twice as much prominence ($M = 76$) as the native English group ($M = 38$) while for the function word (right bar), there was no significant difference among groups ($p < .05$).

Compared to the native English group ($M = 38$), the Korean groups perceive prominence in content words twice as much ($M = 76$). This is proven statistically significant by the ANOVA and Tukey HSD test, $F(3,8) = 7.109$, $p < .05$. Of note, the Korean group with living experience (K3) perceived prominence in content words more than that of any other Korean groups (K1 and K2) as well as the native English group; K3 behaved the most differently from the NE group. This is in stark contrast to the perception of prominence in function words. Among all groups, there was no much difference (17 to 22) except the K2 group. The K2 group perceived twice as much prominence ($M = 38$) as the NE group ($M = 17$). Nevertheless, there were no significant differences ($p < .05$) between the groups, $F(3,8) = 1.786$. In sum, as the native English speakers, the Korean groups were sensitive to perceive prominence in content words. Of interest, they perceived twice as much prominence as the native English speakers. In perceiving prominence in function words, there was no group difference between the Korean groups and the native English group. This was contrary to our prediction made in section 1 that the Korean learners might perceive more prominence in the function words due to the L1 influence (i.e., H tones of postpositional particles). Of note, among the Korean groups (K1-K3), there were no significant group differences despite the different language backgrounds.

3.3. Distribution by Word Boundaries

3.3.1. Distribution in ip and IP Boundaries

This section will examine the perceived prominence by its place in the boundaries: intermediate phrase and intonational phrase. As discussed in section 1, the English intermediate phrase seems to be longer than the Korean accentual phrase. Therefore, it is possible that the Korean English learners might be confused and perceive prominence more often than the native English speakers due to the L1 influence. Considering this, we compared the distribution of perceived prominence across two boundaries (i.e., ip and IP) and found some evidence as shown in Figure 7.

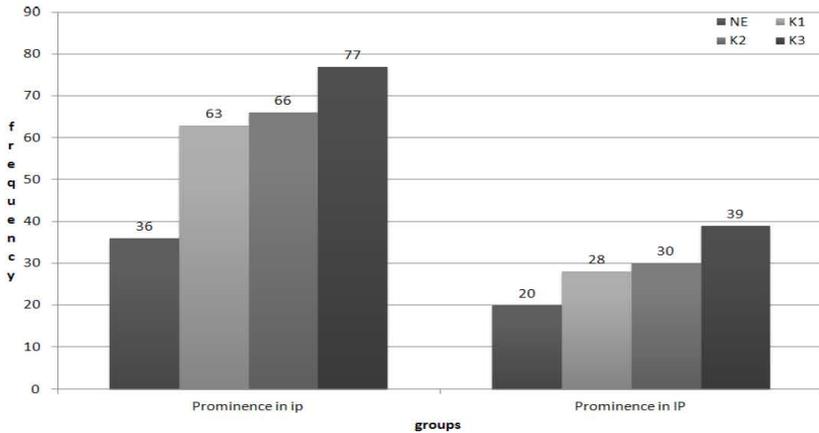


Figure 7. Distribution of prominence by ip and IP. For both prominence in ip (left side) and prominence in IP (right side), there are significant differences between the native English group and the Korean groups ($p < .05$). Of note, the K3 behaves the most differently from the NE group in both cases.

In both boundaries, the Korean groups tended to perceive prominence more than the native English group; for the prominence in ip, the Korean groups perceived the prominence 69 times on average while the native English group did 36 times. There was a significant group effect, $F(3,8) = 16.484$, $p < .05$. Post-hoc test also revealed that the native English group differed from the Korean groups. For the prominence in IP, the Korean groups noticed prominence 32 times on average while the NE group did 20 times. There was a group-difference, $F(3,8) = 17.956$, $p < .05$. The Tukey HSD test revealed that the groups were divided into three: NE *versus* K1-K2 *versus* K3. The K3 behaved the most differently from the NE group in both cases of ip and IP.

As discussed in section 1, English contains only one nuclear pitch accent in the intonational phrase. Considering our data, of 24 sentences, there are 24 possible nuclear pitch accents. Sometimes, the speakers spoke so fast that two short sentences were connected together and perceived as one sentence. Therefore, there are less than 24 possible prominence in our data. As we expected, the NE group seemed to be aware of IP and NPA while the Korean groups were not. The NE group perceived prominence 20 times (i.e., less than 24 times) while the Korean groups perceived 32 times on average (i.e., more than 24 times). There was a group difference between the NE group and the

Korean groups, $F(3,8) = 17.956, p < .05$. In sum, the differences between the NE group and the Korean groups and the similarities among the Korean groups might be attributable to the L1 interference.

3.3.2. Distribution Before and After ip Boundaries

This section will look at the distribution of perceived prominence before ip and after ip. In section 1, we mentioned the similarities and differences between English and Korean; for the similarities, both English and Korean have H tone before ip (or ap in Korean). For the differences, English does not necessarily begin with H tone while Korean mostly begins with H tone due to the edge prominence (S-A Jun 2005). Therefore, we may predict that the NE group and the Korean groups show the similar perception results before ip and the different results after ip.

Figure 8 depicts the distribution of prominence before ip and after ip.

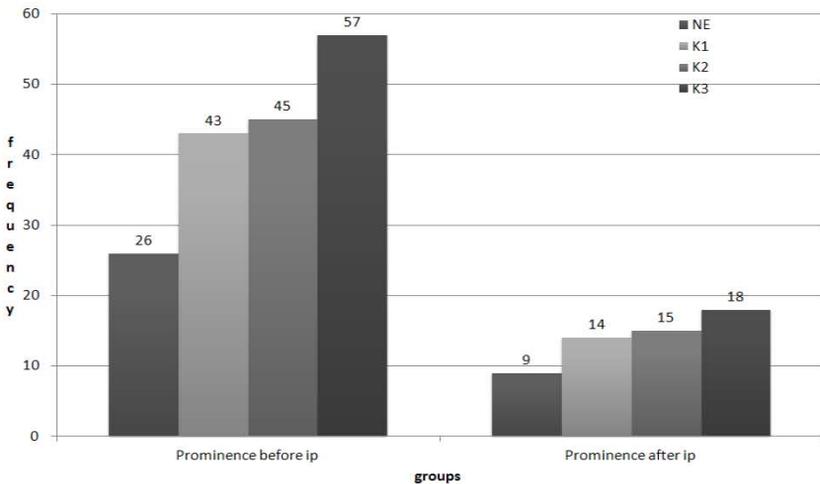


Figure 8. Distribution of prominence before ip and after ip. For both prominence before ip (left side) and prominence after ip (right side), there were significant differences between the NE group and the Korean groups ($p < .05$).

Contrary to the prediction, two groups did not show the similar results. The Korean groups were more sensitive to the H tone before ip than the NE group; the number of prominence before ip perceived by the Korean groups was much more ($M = 48$) than that by the na-

tive English group ($M = 26$). There was a significant difference between the groups, $F(3,8) = 16.808$, $p < .05$. To this outcome, there is a possible explanation. Korean H tone before *ap* is always determined by its place (LHLHa or HHLHa) while English H tone is not necessarily determined by its place due to the occasional insertion of words after NPA (i.e., tails). Therefore, due to the L1 influence, the Korean groups might perceive the prominence before *ip* much more than the native English speakers.

The NE group and the Korean groups also differed from each other in the prominence perception after *ip*. As expected, the Korean groups perceived prominence after *ip* more often than the native English group; the number of prominence after *ip* was much bigger in the Korean groups ($M = 16$) than the native English group ($M = 9$). There was a significant difference between the groups, $F(3,8) = 4.010$, $p = .052$. These findings suggest that due to the L1 influence, the Korean groups were more sensitive to the prominence after *ip* than the NE group.

In sum, the results of the present study reveal the overall picture of perceiving English prominence and boundaries in the spontaneous data by four different groups: the native English group (NE) and the Korean groups (K1, K2 and K3). First, it confirms that prominence perception is different between the native English group and the Korean groups; the number of prominence perceived by Korean groups was twice much as that by American group. Meanwhile, the boundary perception was not significantly different among four groups. The findings indicate that the Korean groups have a different concept of prominence from the NE group while all of groups have a similar concept of boundaries. Second, the perception of prominence by word type (i.e., content word and function word) provides the evidence of perceptual differences between the groups. The Korean groups perceived the prominence in the content words twice much as that of NE group. The Korean groups, however, did not differ from the NE group in perceiving prominence in function words. The results indicate that Korean groups seemed to be aware that content words correlate with prominence in English. Third, the prominence in *ip* and *IP* shows the group effect between the NE group and the Korean groups. The prominence in *ip* and *IP* perceived by Korean groups was much bigger than that by the NE group. The results of prominence in *IP*

(i.e., the nuclear pitch accent) indicate that the Korean groups might not have the concept of nuclear pitch accent and IP in English. Finally, the prominence before ip and after ip proves a group difference between the NE group and the Korean groups. The Korean groups perceived more prominence than the NE group before ip and after ip. These findings suggest that the Korean groups have different perception of prominence partly due to the L1 influence. So far, we have examined the perception of prominence and boundaries in English and their distribution by word type and word boundaries. In the next section, we will explore the meanings of what has been discussed.

4. Discussion

The major findings of the present study will be discussed in this section. The perception of prominence and boundaries will be explored by group. First, the perceptual difference between the native English group (NE) and the Korean groups (K1-K3) will be discussed. Then, we will focus on the perceptual similarities among three Korean groups despite their different language backgrounds of English proficiency and LOR. Overall, we will discuss the reason why the similarities and differences exist among the groups.

4.1. Perception of English Prosody between Two Groups: the Native English Group (NE) and the Korean Groups (K1-K3)

There was a significant difference between the native English group and the Korean groups; the Korean groups perceived prominence more often than the NE group in most of cases: in content words, in intermediate phrase, in intonational phrase, before intermediate phrase and lastly, after intermediate phrase. There was no group effect in two of cases: the perception of boundaries and the perception of prominence in function words. These results were predictable because previous studies regarding to the perception of English prosody by Korean learners have reported similar results (e.g., S-H Kang et al. 2012; J-Y Kim 2001; Ueyama & S-A Jun 1997). S-A Jun (2005) confirms this by stating that the perception of prosody differs among various L1

groups due to their first language influence.

Of interest is that the unexpectedly high frequency in prominence perception of the Korean groups. The frequency of prominence perceived by Korean groups was almost twice that by the native English group in most of cases: in content words, in intermediate phrase, in intonational phrase, before intermediate phrase and finally, after intermediate phrase. I found these results surprising and looked into the comments written by Korean participants. Most of participants mentioned that the prominence perception was difficult because they did not have the criteria of prominence. For example, one Korean participant wrote that every word seemed to have the relative prominence and it was difficult to decide which one was more prominent than the other one. The other Korean participant said that the prominence seemed to have so many phonetic cues such as F0 frequency, intensity and length, that it was difficult to decide which phonetic cue had a decisive effect on the judgment of prominence. Overall, Korean participants seemed to be in trouble with the perception of prominence due to the lack of criteria.

How do we explain the high frequency of prominence perceived by the Korean groups? Contrary to the results, previous studies have been reporting that Korean English learners struggle to perceive and acquire English prominence due to the L1 interference (e.g., J-Y Kim 2001; Ueyama & S-A Jun 1997). The Korean English learners, however, seemed to be sensitive to English prominence in the spontaneous data in the present study. To this outcome, there are several possible explanations; first, as the Korean English learners do not have the criteria, they might have relied on the L1 prosody system. Due to the L1 influence (i.e., accentual phrase, edge prominence, postpositional particles), the Korean learners might have become sensitive to English prominence. Second, the Korean learners might pay so much attention to the various phonetic cues of English prominence that they became extremely sensitive to the English prominence. According to the comments written by the Korean participants mentioned before, the Korean learners seemed to have troubles in judging which phonetic cue had a decisive effect on the English prominence. Therefore, the complex nature of English prominence might be attributable to the sensitivity of the Korean learners. Finally, the sensitivity of English prominence shown by Korean participants might be due to the nature of data of

the present study; the data was a spontaneous public speech with 24 sentences. Compared to this, most of previous studies dealt with the perception of prominence in the restricted data: minimal pairs, pseudo words and a pair of words in carrier sentences. As the Korean participants had been scarcely exposed to the natural spontaneous data, they might have been confused with and become sensitive to the prominence in the data.

4.2. Perception of English Prosody among Three Korean Groups: the Intermediate (K1), the Advanced without Living Experience (K2) and the Advanced with Living Experience (K3)

Contrary to our prediction, there was no significant difference among three Korean groups despite the different English proficiency levels and LOR. The Korean groups demonstrated the similar perception results in most of cases: the perception of prominence; the perception of boundary; the perceived prominence in content words; the perceived prominence in intermediate phrase; the perceived prominence before intermediate phrase and lastly, the perceived prominence after intermediate phrase. There is a group effect in two of cases: the perceived prominence in function words (K1-2 *versus* K3) and the perceived prominence in IP (K1-2 *versus* K3). We expected there would be a group effect among three groups and the more advanced the group, the more similar to the NE group. Therefore, the following question arises: what are the reasons for similar patterns among the Korean groups?

The more detailed analysis of Korean participants helps us find the answer. Following the results, there were no significant group differences despite the different language backgrounds: English proficiency level (K1 *versus* K2-K3), English listening scores (K1 *versus* K2-K3) and living experience in English speaking countries (K1-K2 *versus* K3). Moreover, there were unexpected group behaviors; the K1 behaved similar to the NE while the K3 did the most differently from the NE. Therefore, we may conclude that all of three Korean English learners do not improve the perceptual ability and eventually, fail to acquire the native-like perceptual skill of English prominence. To this outcome, we may propose a possible explanation: the failure in acquiring English prosody might be due to the complex nature of English and

the strong L1 interference as mentioned in 4.1. Look at the group K3. Although K3 spent 1.6 years in English speaking countries before the puberty (9 years old on average), they do not achieve the native-like perceptual skill. In other words, the 1.6 year living experience and the 9 year age do not guarantee the acquisition of English prosody. Bohn & Flege (1992) support this by showing that the English German learners failed to acquire a group of similar vowels although they had 7.5 year living experience in Germany. In sum, due to the complex nature of English sound system and the L1 interference, the Korean participants have not improved the prosody perception and as a result, shown the similar outcome.

5. Conclusion

In this study, the prosody perception on the spontaneous English by Korean English learners and native English speakers has been explored. The prominence perception was different between the native English group and the Korean groups, while the boundary perception demonstrated similar results between the two groups. A close examination of the two factors, word types and word boundaries, revealed that the Korean groups perceived prominence more often than the native English group in most of cases: in content words; in intermediate phrase; in intonational phrase; before intermediate phrase; and lastly, after intermediate phrase. This was contrary to the previous studies which reported that Korean English learners were not sensitive to English prosody (S-H Kang et al. 2012; J-Y Kim 2001; Ueyama & S-A Jun 1997). Moreover, in most of cases, the Korean groups demonstrated the similar perception patterns despite their different English speaking proficiency and LOR. This might be due to the strong interference of L1 as well as the complex nature of English prosody.

The present study suggests educational implications. As mentioned in section 1, English prosody is an essential area to perceive and decode signals to comprehend the string of speech. Moreover, it is regarded more important than segmental factors (i.e., consonant or vowel) for both listening and speaking (Anderson-Hsieh, Johnson, & Koehler 1992; Bradlow, Torretta, & Pisoni 1996; S-H Kang et al. 2012). Jenkins (2000), in her *Lingua France Core*, suggests that the

instruction of nuclear pitch accent is indispensable to communicate in English in an effective manner. Nevertheless, English prosody has been neglected in current school textbooks and teaching curriculum / syllabus due to its complex nature. Also, it has not been regarded important among English teachers and textbook developers in teaching listening and speaking. I, therefore, suggest that English teachers and textbook developers should pay more attention to English prosody, thus, give more chances for Korean learners to practice and learn.

The present study bears the limitation of small sample size. This prevented generalizing the results about the perception of prominence and boundaries in English. If the sample size had been larger, the results could have been more reliable and generalizable. Lastly, the present study investigated the perception of prominence and boundaries in the spontaneous speech by Korean English learners and English native speakers. Further research is required to study the production of English prosody in the natural speech data, and the comparison between the perception and the production of English prosody by Korean English learners and native English speakers in the spontaneous data.

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Appendix

A. Participant’s Survey Form

- 1. Name: _____
- 2. Age: _____
- 3. Gender: male / female
- 4. Native country: _____
- 5. Native region: _____
- 6. Native language: _____
- 7. Other languages:

	Language	Years and months	Age when you first started study
1			
2			
3			
4			

- 8. Living experience in a country where other than your native language is spoken for more than one month

	Country	Years and months	Age when you first arrived	Purpose
1				
2				
3				
4				

- 9. TEPS scores

Listening	Grammar	Vocabulary	Reading	Total

B. Script of Perception Experiment

A few years ago i felt like i was stuck in a rut so i decided to follow in the footsteps of the great american philosopher morgan spurlock and try something new for thirty days the idea is actually pretty

simple think about something you've always wanted to add to your life and try it for the next thirty days it turns out thirty days is just about the right amount of time to add a new habit or subtract a habit like watching the news from your life there's a few things i learned while doing these thirty-day challenges the first was instead of the months flying by forgotten the time was much more memorable this was part of a challenge i did to take a picture every day for a month and i remember exactly where i was and what i was doing that day i also noticed that as i started to do more and harder thirty-day challenges my self-confidence grew i went from desk-dwelling computer nerd to the kind of guy who bikes to work for fun even last year i ended up hiking up mt kilimanjaro the highest mountain in africa i would never have been that adventurous before i started my thirty-day challenges i also figured out that if you really want something badly enough you can do anything for thirty days have you ever wanted to write a novel every november tens of thousands of people try to write their own fifty thousand-word novel from scratch in thirty days it turns out all you have to do is write sixteen hundred sixty-seven words a day for a month so i did by the way the secret is not to go to sleep until you've written your words for the day you might be sleep-deprived but you'll finish your novel now is my book the next great american novel no i wrote it in a month it's awful but for the rest of my life if i meet john hodgman at a ted party i don't have to say i'm a computer scientist no no if i want to i can say i'm a novelist.

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