

# An Intelligibility-based Approach to English Pronunciation Teaching: Evidence from [r] Production\*

Seokhan Kang and Hyunkee Ahn  
(Seoul National University)

**Kang, Seokhan and Hyunkee, Ahn. (2013). An intelligibility-based approach to English pronunciation teaching: evidence from [r] production. *Language Research* 49.3, 631-646.**

This work was to support the intelligibility-based approach to teaching English pronunciation through the experimental tests. In this study, both production and perception experiments were conducted for thirty three-levelled Korean learners of English and five native English speakers. The results showed that native English raters marked 'good' /r/ sound of Korean speech of English which showed a comparatively wide range of F3 between 2,150 and 2,550 Hz. Considering that native English speakers produced a comparatively narrow F3 range with low mean value between 1,700 and 1,800 Hz, we came to understand that they were tolerant of foreigners' wide range of F3 for [r] signals with comparatively high mean value. Overall, this experiment clearly showed that we should rely more on the intelligibility principle, not on the native-like accurate pronunciation features, for the teaching of English pronunciation. It implies that pronunciation teaching should adopt the intelligibility-based approach.

**Keywords:** English speaking, intelligibility, human raters, acoustic analysis, English pronunciation education

## 1. Introduction

Recently in our school settings pronunciation teaching put more attention on native-like accurate pronunciation. The competitive industry sectors which need those who communicate fluently with native English speakers especially require this teaching and learning model. Thus, the audio-lingual method which uses minimal-pair drills and imitation of

---

\* Partial contents were presented to 2013 ALAK international conference held in Busan University of Foreign Studies. This work is supported by the College of Education at Seoul National University (2012-2013).

native speeches has become the predominant methodology in our English classrooms. This native-like pronunciation goal is, however, unattainable as is well known in the area of second language acquisition (Bongaert et al. 2000).

Instead of the unachievable goal for L2 learners, there now exists a certain viewpoint in pronunciation teaching, based on the premise that the ultimate goal of L2 speech learning is to achieve 'intelligible' pronunciation (Saito and Lyster 2010, Kang and Ahn 2013). By following this perspective, the pronunciation education can be geared toward obtaining the intelligible and comprehensible pronunciation, not the native-like accurate speech. In line with this perspective, this study has the intention to support the argument of intelligible approach education in our schools, analyzing the data of L2 Korean speakers.

For the evidence, this study investigates the native speakers' judgment on Koreans' /r/ sound. Thus, in case that native speakers' judgment on the Koreans' speech corresponds to L1 acoustic features, our pronunciation education should be oriented to the native-like pronunciation teaching. In contrast, intelligible education can obtain the rightness if the study reveals that natives' judgment for the L2 speech is somewhat different from L1 phonetic criteria. In this study, native English raters have rated /r/ sound produced by Korean speakers using Likert scale and then the phonetic relations between native raters' ratings and nonnative speakers' production (also classified by a variable of L2 academic achievement) have been analyzed. The research questions to be addressed in the current study are as follows:

- (1) Which range of F3 in /r/ sound produced by Korean learners of English affect native speakers' judgment of intelligibility?
- (2) Is the intelligible pronunciation teaching is plausible in our English education context?

## **2. Previous Literature**

Recently many researchers propose the relative importance of suprasegmentals in successful L2 communication (e.g., Jenkins 2002, Trofimovich and Baker 2006). However, some educators suggested that learning and teaching English 'segmental' factors can be thought of a

top priority for EFL learners of English to improve overall intelligibility of their L2 speech communication (Munro and Derwing 2006, Saito and Lyster 2010). Saito and Lyster (2010) administered an expert judgment questionnaire to a sample of 120 teachers of English in Japan comprising both native and non-native speakers of English, asking them to rank 25 pronunciation problems, which included a number of problematic segments (e.g., /ð/, /θ/, /f/, /v/, /æ/) as well as some troubled suprasegments (e.g., lexical and sentential stress, speech rate, fluency). Results corroborated previous findings that English /r/ is considered as the most crucial teaching/learning target owing to its potential to affect the intelligible pronunciation of Japanese learners of English. Also Munro and Derwing (2006) argue that the English /r/ and /l/ contrast, which has a relatively large number of frequently occurring minimal pairs, needs to be considered as one of the top teaching/learning targets for ESL/EFL students worldwide mainly because of its high functional load on listeners' comprehension.

The studies in Korea also follow the streams of international studies because of mismatched phoneme relations between two languages (e.g. Kang 2002, Park 2008), in which Korean lacks phonemic and also phonetic distinctions between a retroflex approximant [ɻ] and a lateral approximant [l] of English. In Korean, there are two liquids: [l] as a light apical lateral approximant and [ɻ] as an apical flap (Ladefoged and Maddieson 1996). But these two sounds do not distinguish meaning but occur in complementary distribution; [ɻ] between vowels and [l] elsewhere. The mismatched relation between English and Korean leads to the prediction that Korean learners of English have difficulty in acquiring [ɻ] sound of English.

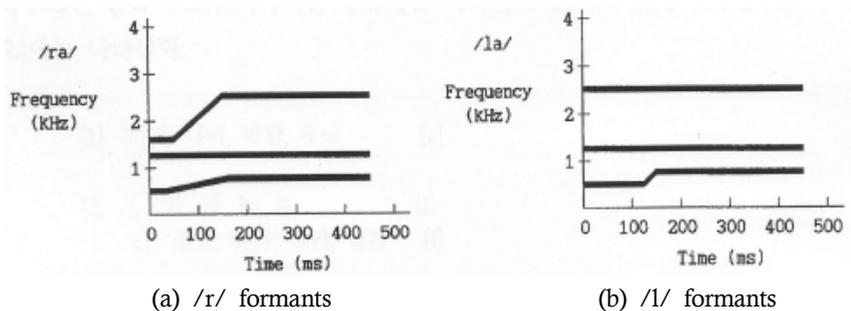
Kang (2002) investigated how Korean learners of English distinguish English /r/ and /l/ in four different word positions. She found that the frequency of the subjects' errors was sensitive to word positions and also fewer errors in intervocalic medial position. It means that Korean subjects' acquisitional pattern in learning foreign phones can be explained more by language specific interference effects rather than universal acoustic arguments. Park (2008) examined whether Korean learners' perception of English liquids showed variable patterns according to different syllable positions and neighboring vowel environments. She drew the conclusion that late Korean learners' perception ability of English liquids differed from early learners' significantly, and that

their identification abilities were a function of neighboring vowel environments.

The results of these researches suggest that English /r/ is considered the most crucial learning target phoneme because of its high probability to affect the intelligible pronunciation of Korean learners of English. They argue that Korean teachers of English need to be considered as one of the top teaching priorities because of its high functional loads on native speakers' listening comprehension (e.g., Munro and Derwing 2006, Saito and Lister 2010). Thus, examining this well-researched topic is expected to be necessary for the meaningful implication on English pronunciation education.

### 3. Acoustic Properties of English /r/

The previous studies have examined which acoustic properties determine native speakers' intelligible /r/ pronunciation (Nolan 1983, Hagiwara 1995). Generally, /r/ is frequently compared with /l/ because both consonants are classified as liquids. Both liquids are distinguished especially by F3 frequency. For details, the most distinctive property of /r/ is a lowered F3 which is narrowly separated from F2 (Kent and Read 2003). Compared with English /l/ consonant, /r/ has lower frequency of F3, and this feature can be used to identify the occurrence of phoneme /r/ (see Figure 1).



**Figure 1.** The first three formant structure of /r/ and /l/.

Interestingly, the current segmental studies tend to focus more on the acquisition of English /r/ rather than /l/ (Saito and Lyster 2010). A number of studies have demonstrated that English /r/ is acquired

with more difficult by Korean learners (along with Japanese learners of English) because of mismatched phoneme relations between two languages (e.g., Park 1999, Kang 2002).

Generally English /r/ is associated with a low F3 that is close to F2 (see Figure 2). Nolan (1983) reported the mean formant frequencies for /r/ produced in a list of words by fifteen 17-year-old males: F1-320 Hz; F2-1090 Hz; F3-1670 Hz. Hagiwara (1995) showed that for adult male speakers, F3 has a modal value of about 1500 Hz (range of about 1,300 to 1,800 Hz). However, for adult female speakers, his results showed a bimodal distribution, with some women having a relatively low F3 mean of about 1700-1800 Hz and others having a relatively high F3 mean of 2200 Hz or above. He suggested that the extent of F3 lowering was best determined in relation to a neutral value of F3, rather than in relation to some speaker-independent critical frequency value.

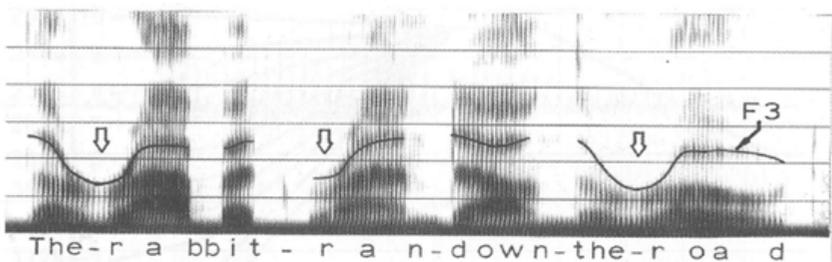


Figure 2. /r/ formant formation in the sentences (Kent and Read 2003).

#### 4. Experimental Methods and Materials

The current study was carried out with subjects of five native English raters, and thirty Korean learners of English who were divided into three groups (i.e., 10 low-achievement, 10 mid-achievement, and 10 high-achievement of TEPS). All of them had learned English for more than 10 years in Korea. No subjects have lived in English-speaking countries.

As we wished to study the effect of academic achievement levels on /r/ production, we sought to control the level of English proficiency among three groups. In that way, differences in production could be

more likely attributed to an effect of academic achievement level than overall English proficiency. We used universal standardized tests to select subjects who had similar English academic proficiency among the three Korean groups. TEPS (The Test of English Proficiency developed by Seoul National University) measured four English abilities (reading, listening, speaking, and writing), and the maximum possible score was 1000 at the time of experiment. This test was chosen as a criterion because it was designed to test English proficiency at an adult level and it is also known to be a reliable tool to measure English proficiency (see [www.teps.or.kr](http://www.teps.or.kr)). The test was administered to 30 participants in the three Korean groups. The low achievement group performed at 64% correctness (642/1000), with a standard deviation of 82.91. Also the mid achievement group performed at 76% correctness (761/1000), with a standard deviation of 78.23. The high achievement group performed at 86% correctness (863/1000), with a standard deviation of 64.72. The one way analysis of variance confirmed that there was a significantly different effect of group on the scores,  $F(2,29) = 8.767$ ,  $p < .001$ .

In the production test, F3s at the /r/ produced by three leveled 30 subjects were analyzed. Ten words (*read, room, root, rule, red, race, rough, row, ram, right.*) which have different vowels in post-consonantal position were used as target words in each task: word reading, sentence reading, and picture-story telling (see Appendix). In word and sentence reading tasks, these target words were mingled with other 30 words. In the picture-story telling task, subjects were asked to compose the story using the given target words. They knew how to pronounce all given words or sentences. The recording was made at a sound-proof booth at Seoul National University. The sounds were recorded with a Marantz PMD 650 using a Shure SM 10A microphone, digitalized at 44.05 kHz and 16 bit resolution.

For the acoustic analysis, we adopted the procedures used by Flege et al. (1995). The beginnings of the English /r/ were first carefully identified by the endpoint of falling F3 occurred in pre-consonantal vowel, and then a cursor was put on the location where energy was clear for all three formants and F3 was starting to rise.

## 5. Judgment Test

As a reliable way to examine acoustic properties of speech samples such as frequency values of formants, L2 acquisition researchers tend to draw on selected-acoustic analysis; this kind of acoustic analysis enables researchers to catch the differences in the acoustic properties of L2 phonemes (Ladefoged 2003). Further, we tried to combine the acoustic analysis and human rating methods. That is, English native speakers were recruited to rate a total set of speech data produced by three Korean groups. Second, we analyzed the F3 values for 30 subjects' production and compared them with human ratings. The hypothesis here was that difference in F3 among three groups might enhance the accuracy levels of L2 speech.

In the perception experiment, five native English raters were asked to rate a small subset of speech samples randomly selected from the original data pool of speech tokens which elicited at the sound of /r/. They were from Midwestern areas of North America. Answer sheets were prepared for the raters. They rated after listening for subjects' pronunciation through a headphone.

For rating and judgment analysis, those were extracted from three tasks. Nine hundred speech tokens (10 words \* 3 tasks \* 30 subjects) were randomly chosen from the original data pool of the subjects' speech and then presented to the five native English raters to rate. In selecting the sounds for the perception test, the first author placed a cursor at the onset of the target word, and then moved to the end of the word in order to cut and paste in into a separate sound file. In this manner, all 900 tokens were prepared and put on one USB storage to be used in the rating experiment.

The native English listeners were presented speech tokens in a randomized order and asked to rate them on a 9-point scale with 1 as "very poor accurate English /r/" and 9 as "very excellent accurate English /r/". For acoustic analysis, the beginning of the English /r/ was first carefully identified by the starting point of rising F3, and then a cursor was put on the location to the beginning of the following vowels. These measures were analyzed with one way ANOVA which were conducted for statistical evaluation of the groups with the following parameters; dependent variables of F3 frequency in each task were examined by the independent factor of Group (three levels:

Low, Mid, High).

## 6. Intelligibility Analysis

### 6.1. Ratings

Samples from paragraph recordings ensured that the content was held relatively constant across speakers. The 900 samples (300 for low achievement group, 300 for mid achievement group and 300 for advanced group) were randomized and presented to the native English raters using a loud speaker. The English listeners were recruited to evaluate the intelligibility of the L2 speakers using a 9-point Likert scales (from 1 = no intelligible speaking to 9 = extremely native-like intelligible speaking). The adaptation of 9-point Likert scale follows the study of Southwood and Flege (1999) that a 9 or 11-point scale is the most appropriate rating scale to evaluate L2 speech samples for the degree of intelligible speech. The experimental sentences were presented to a group of five native speakers of English for intelligible judgment. All of the raters were native English speakers who had some experience in teaching English in Korea. All raters reported normal hearing. The raters were encouraged to use the entire scale and to guess if they were unsure. For the judgment, the raters listened to some of the paragraph samples before rating each speaker. After confirming their pre-rating tests, they started rating the speech separately.

### 6.2. Results

The first purpose of the present study was to test the hypothesis that advanced L2 learners were more likely to produce accurate L2 pronunciation. We examine (a) which F3 ranges produced by non-native English speakers are significantly correlated to native English rating scores, (b) whether there is any relation between /r/ production by three groups and their academic achievement (e.g., TEPS scores). The ratings of the samples indicated that most of the raters kept the reliable results. The dependent variable in this analysis was the mean of intelligibility ratings calculated by averaging the five English listeners' ratings on the thirty Korean subjects. The intra-class correlation

coefficient was used to measure the degree of inter-rater reliability for each group of raters' evaluation of the subjects' speaking. The raters' coefficient was highly correlated,  $r(5) = 0.94$ ,  $p < .0001$ . These results indicated the high levels of agreements among all the native raters.

The scores for three Korean groups were quite similar, ranging from 4.0 to 6.0 out of 9. The statistical difference on the intelligibility ratings was not significant (low academic achievement group = 5.58, mid group = 6.12, advanced group = 5.62,  $p > .05$ ). The obtained ratings were submitted to one way ANOVA with three Korean groups. This analysis revealed a non-significant group difference ( $F(2, 690) = 2.232$ ,  $p > .05$ ). The analysis indicated that academic achievement didn't have significant influences on determining the patterns of L2 accurate pronunciation of English /r/. Also in their goodness of English ratings on a 9-point scale, the raters perceived F3 values around 2220 Hz as very good English /r/, with F3 values around 2380 Hz as neutral English /r/, and F3 values around 2580 Hz as very poor English /r/. In sum, there is no relationship between the /r/ production by English proficiency levels and native listeners' judgment of /r/ accuracy.

## **7. Acoustic Analysis**

### **7.1. Measurement**

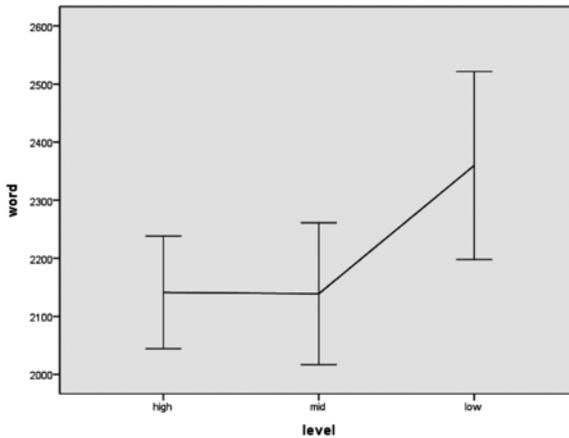
The acoustic analysis sought to identify whether F3 values contributed to intelligibility ratings in the L2 learners speech and to determine the extent to which they did so. The /r/ pronunciation through three tasks was used to evaluate the intelligibility of each group. The third formant frequency was measured using a waveform display with a time-locked wideband spectrogram with the software Praat (5.1.17). All F3 cues were measured from the initial acoustic signal in both waveform and spectrogram to the final acoustic cues of the boundary such as burst or spectral cues (Kent & Read 2003).

In the analysis process, a spectrographic representation of each word was displayed on the computer screen using Praat program at the first stage. Then both researchers listened to each token and tried to locate the beginning and ending of the /r/ sound. As a reliable clue, the

starting point of English /r/ was identified by the endpoint of gradually falling transition of F3. The F3 of the preceding vowel and consonant sounds tend to gradually fall, because the F3 for English /r/ is relatively low (e.g., Kent and Read 2003, Ladefoged 2003).

## 7.2. Results

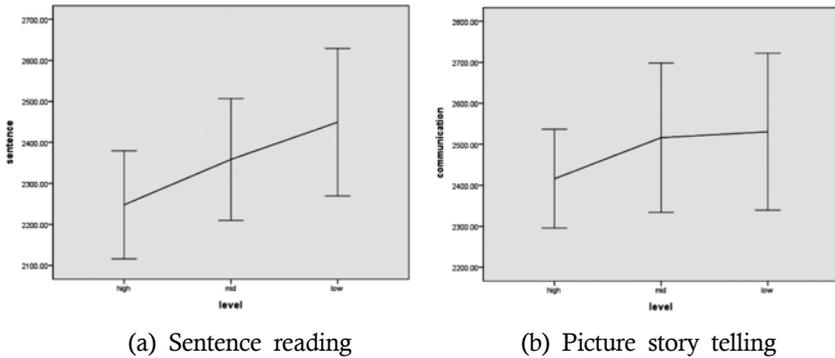
The statistics results showed that F3 values of ‘/r/’ pronunciation was meaningful difference in word reading, but not in sentence and picture story telling tasks. Specifically, the one way analysis of variance confirmed that there was a moderately significant effect of group on overall F3 values in word reading,  $F(2,769) = 8.767$ ,  $p < .05$ . Tukey’s tests ( $p < .05$ ) revealed that the F3 value was higher for the low group ( $m = 2,359$  Hz) than both the middle ( $m = 2,139$  Hz) and the high group ( $m = 2,141$  Hz). Figure 3 presents the F3 values produced by the three groups in word reading.



**Figure 3.** Range of F3 values in word reading by three groups.

In contrast with the result of word reading, the one way analysis of variance confirmed that there was no significant effect of group on overall F3 values in sentence reading,  $F(2,299) = 2.875$ ,  $p > .05$ . Tukey’s tests ( $p < .05$ ) revealed that the F3 values of all three groups were categorized as same group: the low group ( $m = 2,449$  Hz), the middle group ( $m = 2,358$  Hz) and the high group ( $m = 2,250$  Hz). Also there was no significant effect of group on overall F3 values in picture story

telling task,  $F(2,299) = 1.215, p > .05$ . Tukey's tests ( $p < .05$ ) revealed that the F3 values of all three groups were categorized as the same group: the low group ( $m = 2,508$  Hz), the middle ( $m = 2,495$  Hz) and the high group ( $m = 2,410$  Hz).



**Figure 4.** Range of F3 values in sentence and picture story telling tasks by three groups.

We conducted the statistical analysis by the task type independently. The results showed that the Korean learners of English tended to produce significantly higher F3 values (compared with native English speakers) when careful attention required by following the three different task types: word reading ( $m = 2,181$  Hz) < sentence reading ( $m = 2,342$  Hz), picture story telling ( $m = 2,411$  Hz). Interestingly the difference in F3 values were significant only in word reading which required strong cognitive attention. However, these differences diminished when the tasks with more natural conversation types were presented. In short conclusion, F3 values could be approached to /l/ phoneme when the tasks were oriented to the natural communication. In that case, no difference among three groups could be found. The only difference was shown in word reading which paid more attention on the accurate pronunciation.

## 8. Discussion

As for the first question, which acoustic properties of /r/ produced by Korean learners of English affected native speakers' judgment, the

current study identified F3 values for English /r/ as the most crucial speech properties with some variance according to the task type. This finding resulted from outcome measures that combined human ratings and acoustic analysis. In this study, the results showed that speech tokens with F3 values around 2,200~2,300 Hz tended to be considered as 'good-enough' exemplars of English /r/, those with F3 values around 2,400~2,600 Hz proved to be neutral, and speech tokens with F3 values above 2,600 Hz were judged poor exemplars of English /r/.

Important to note was that native English raters' ratings were relatively lenient rather than strict, because their judgment of good exemplars (F3 values around 2,200~2,400 Hz) was still significantly different from the native speakers' baseline data with F3 values at around 1,600~1,700 Hz (or 1,600~1,800 Hz, *see* Kent and Read 2003: 181). In other words, not only did the current study identified F3 as a crucial speech property which significantly influenced raters' judgment of English /r/, but also set realistic goals for L2 learners in terms of intelligible pronunciation of English (F3 around 2,200~2,400 Hz) rather than native-like accurate pronunciation of English /r/ (F3 around 1,600~1,700 Hz).

For the second research question, which direction we should choose for our future English education, the results implied that an intelligibility-based approach to the pronunciation education should be considered because the L2 subjects' proficiency level was not related with F3 values according to the native English raters. More specifically, the high-level subjects produced speech tokens with F3 values around 2,254 Hz and mid-level subjects with F3 values around 2,138 Hz, while low level subjects made speech around 2,359 Hz. The results showed that F3 values of the mid-levels subjects were close to those of native English speakers. Furthermore, native English raters didn't distinguish the F3 values by three Korean groups.

Although previous studies reported that English proficiency levels had significant influences on /r/ production and perception (e.g., Park 1999, Kang 2002), the current study showed no group differences in both sentence reading and picture-story telling tasks which are close to the natural conversation settings. The results may come from participants' cognitive load-work because it could be predicted that even members of high achievement group could not concern only on accurate /r/ production when they composed the conversation in mind.

As an educational implication, teaching pronunciation should put more attention on the intelligibility-based approach than on the native-like accurate pronunciation teaching and learning. Native English speakers tended to be tolerate of intelligible pronunciation, widening the F3 range. Thus, nonnative English teachers should apply the result to the teaching for the English pronunciation of nonnative English learners.

## 9. Conclusion

This study is to investigate how native English raters have rated /r/ sound produced by Korean speakers and which relations can be found between native raters' ratings and nonnative speakers' production. In the process, we examined the hypothesis that the acoustic features produced by high academic achievement group could create more accurate pronunciation than the other groups (low and mid group). However, the research results revealed that the high achievement group of TEPS did not demonstrate any significant difference of F3 values in both sentence reading and picture-story telling tasks which could be more similar as natural conversation. Also their pronunciation hardly exerted distinctive rating patterns of accuracy with other two Korean groups. These results pointed at one crucial theoretical issue in English education for Koreans – how we approach to teaching English pronunciation.

First of all, the English proficiency achievement is not related with accurate pronunciation of L2 speakers. It implies that accurate teaching methods such as minimal pair drill or imitation of native speakers' pronunciation should be reconsidered in our English curriculum. Rather, natural conversation teaching could be the optional choice.

Also the results suggest that pronunciation education in our country should focus more on an intelligibility-based teaching because native English speakers' judgment for the /r/ phoneme tends to widen the range of F3 when they determine the intelligible /r/ sound for the EFL speakers. That is, industrial sectors' requirement for the native-like accurate L2 pronunciation loses the theoretical background because native speakers are tolerated of F3 ranges for L2 speakers.

The results support the rightness of Korean English teachers' role,

suggesting that Korean teachers should take charge of English pronunciation teaching in our school settings. It may be true that Korean L2 learners may get the negative reputation in accurate English pronunciation education, compared with native English teachers. However, considering that native English speakers put more weight on intelligibility, not on accuracy, and that they judge the goodness of L2 pronunciation different from L1 acoustic features, the natural conversation education by Korean teachers of English could be the ideological educational model.

Overall, the current study adopted mixed methodological features with respect to outcome measures of F3 features. Instead of adopting only human rating methods, the current study used both human rating methods and acoustic analyses. This technique enhanced the validity of pronunciation teaching studies of this kind. However, this study had some limitation in generalizing the results: (1) the number of human raters (2) the definition of accuracy or intelligibility. First of all, the numbers of human raters are limited so that the results may have been biased. Future studies require more human raters. Also when raters rated the L2 pronunciation of /r/, they sometimes confused what was 'accurate' or 'intelligible' pronunciation. Thus, the clear definition for these norms should be given before the rating sessions.

## References

- Derwing, T., Munro, M., and Wiebe, G. (1998). Evidence in favor of a broad framework for pronunciation instruction. *Language Learning* 48, 393-410.
- Hagiwara, R. (1995). Acoustic realization of American /R/ as produced by women and men. *University of California-Los Angeles Working Papers in Phonetics* (Phonetics Laboratory, University of California-Los Angeles), 90.
- Jenkins, J. (2002). A sociolinguistically based, empirically researched pronunciation syllabus for English as an international language. *Applied Linguistics* 23, 83-103.
- Kang, H.-S. (2002). Perception and production of English /r/ and /l/ by Korean learners of English: an experimental study. *Speech sciences* 6, 7-24.
- Kang, S.-H. and Ahn H.-K. (2013). An Intelligibility-Based Approach to English Pronunciation Teaching: Evidence of [r] Pronunciation. *ALKA 2013 international conference, Proceedings*, 125-127.
- Kent, R. and Read, C. (2003). *The acoustic analysis of speech*. Boston: Thomson

Learning.

- Ladefoged, P. (2003). *Phonetic data analysis: an introduction to instrumental phonetic fieldwork*. Oxford: Blackwell.
- Ladefoged, P. and Maddieson, I. (1996). *The sound of the world's languages*. Cambridge: Blackwell.
- Munro, M. and Derwing, T. (2006). The functional load principle in ESL pronunciation instruction: An exploratory study. *System* 34, 520-531.
- Nolan, F. (1983). *The phonetic bases of speaker recognition*. Cambridge, U.K.: Cambridge University Press.
- Park, S.-A. (2008). A study of English /l/ and /r/ perception by Korean elementary, middle, and high school students. *Language and Linguistics* 42, 73-92.
- Saito, K. and Lyster, R. (2010). Effects of form-focused instruction and corrective feedback on L2 pronunciation development of /r/ by Japanese learners of English. *Language Learning*, 1-33.
- Southwood, M. and Flege, J. (1999). Scaling foreign accent: direct magnitude estimation versus interval scaling. *Clinical Linguistics & Phonetics* 13, 335-449.
- Trofimovich, P. and Baker, W. (2006). Learning second language suprasegmentals: Effect of L2 experience on prosody and fluency characteristics of L2 speech. *Studies in Second Language Acquisition* 28.1, 1-30.

Seokhan Kang  
Institute of Foreign Language Education  
Seoul National University  
1, Gwanak-ro, Gwankak-gu  
Seoul 151-748, Korea  
E-mail: kang45@snu.ac.kr  
<https://sites.google.com/site/reall2research>

Hyunkee Ahn  
Department of English Language Education  
Seoul National University  
1, Gwanak-ro, Gwankak-gu  
Seoul 151-748, Korea  
E-mail: ahnhk@snu.ac.kr

Received: November 3, 2013

Revised version received: November 30, 2013

Accepted: December 5, 2013

# Appendix

## 1. Word reading

deep, live, read, room, full, ship, fool, suit, sheep, root, fill, dip, rule, hood, pull, red, soot, fit, race, feel, rough, row, leave, ram, could, right, cooed, feet, who'd, pool

## 2. sentence reading

- (1) He would, if he could.
- (2) I think she intends to live at 60 A.
- (3) He will read my paper by the time I arrive there.
- (4) Choose blue for the new room.
- (5) She left her red bicycle on the side of the road.
- (6) The race was cancelled because of the rain.
- (7) The woman took a good look at the wolf.
- (8) I can't put anything in this pocket.
- (9) What do you think the ship on the horizon is?
- (10) I don't really think you want to leave him.
- (11) The flowers bloom soon in June.
- (12) I can correct all wrong sentences tonight.
- (13) Six sheep were sick on the barn.
- (14) Ryan does not like to run in the snow.

## 3. Picture story telling

<p>Slide 1: A person reading a newspaper.</p>	<p>Slide 2: A list of Korean text.</p>	<p>Slide 3: A woman holding a baby.</p> <p>Slide 3: baby, mother, baby</p>	<p>Slide 4: A person reading a newspaper.</p> <p>Slide 4: newspaper, read, newspaper, read</p>
<p>Slide 5: A landscape with sheep.</p> <p>Slide 5: the sheep, already, sheep</p>	<p>Slide 6: A person climbing a mountain.</p> <p>Slide 6: to climb, to mountain, mountain</p>	<p>Slide 7: A wolf's face.</p> <p>Slide 7: wolf, the wolf, wolf</p>	<p>Slide 8: A road winding through a landscape.</p> <p>Slide 8: the road, had, road</p>
<p>Slide 9: A ship on the water.</p> <p>Slide 9: the ship, ship</p>	<p>Slide 10: A person in a red jacket.</p> <p>Slide 10: jogging, had, jacket</p>	<p>Slide 11: A city at night.</p> <p>Slide 11: The city, great, view</p>	<p>Slide 12: A full moon in the sky.</p> <p>Slide 12: Moon, full, moon</p>