

Comprehensibility of Korean EFL speakers' English pronunciation: Changes over time*

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Yoo, Hyebae. 2017. Comprehensibility of Korean EFL speakers' English pronunciation: Changes over time. *Studies in Phonetics, Phonology and Morphology* 23.1. 95-115. The purpose of this study is two-fold. The first is to investigate changes over a decade in native English listeners' judgment of the comprehensibility of speech read aloud by Korean EFL university students. The second is to examine the relative effects of acoustically measured prosodic features on comprehensibility. Acoustic data from 19 students (10 male and 9 female) who entered university in 2000 and 19 more (10 male and 9 female) who entered in 2012 were employed for comprehensibility judgment by 10 native listeners. The findings showed that the degree of comprehensibility by native speakers rose significantly from 2000 to 2012. General comprehensibility more closely correlated with suprasegmental than with segmental comprehensibility. A stepwise multiple regression analysis revealed that among the suprasegmental features of pitch ratio, duration ratio, intensity ratio, pitch range, and speech rate, speech rate is associated with comprehensibility to the greatest degree, followed by duration ratio. As for specific problem areas, vowels tended to be the most problematic area without any improvement in the pronunciation of segmentals, while there was a gender effect for suprasegmentals; female speakers improved in all the areas of stress, pause, rhythm, and intonation, whereas male speakers' intonation improved more than other areas. (Incheon National University).

Key words: comprehensibility, acoustic correlates, gender effect, Korean EFL learners, foreign accent

1. Introduction

Within communicative language teaching approaches, the comprehensibility of English

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pronunciation has been emphasized in education over several decades, while traditional accuracy-based pronunciation has been avoided in Korea. In this atmosphere, the relative importance of suprasegmentals in language acquisition has received more attention, and efforts have been made to enhance suprasegmental learning.

A recent longitudinal study (Yoo 2016) on Korean EFL students' prosody analyzed acoustically the English pronunciation of Korean cohorts of 2000 and 2012 to investigate their accent improvement over a decade. Group 2012 who had received elementary English education outperformed Group 2000 who had not had exposure to English until junior high school in the ratios of stress-timing, intensity, speech rate, and pitch change. The question arising from the research was whether this improvement in suprasegmental features contributed to an improvement in comprehensibility by native speakers of English. Does improved prosody result in greater comprehensibility? This study seeks to answer this question by examining the effects of suprasegmental features on the comprehensibility judgment of EFL learners' pronunciation. Previous studies that supported the role of suprasegmentals (Anderson-Hsieh et al. 1992, Trofimovich and Baker 2006, Kang 2010) would predict a positive result.

While studies have been conducted on native speakers' judgments of the comprehensibility of foreign accented speech (Kang 2010, Yom 2011, Lee 2013), the findings of these studies were cross-sectional and did not demonstrate changes over time. For example, Yom (2011) investigated Korean L2 suprasegmental acoustic features and their effect on comprehensibility for seven Korean students one time. Therefore, it is worth investigating the changes in native speakers' judgments of L2 comprehensibility over a decade.

The research questions for this study are as follows: 1) To what degree have Korean university students improved the comprehensibility of their English pronunciation over a decade? 2) Which of segmentals and suprasegmentals play a more dominant role in comprehensibility? 3) What are the more significant suprasegmental features that affect comprehensibility judgment? This study seeks to answer these questions.

2. Literature review

2.1 Perception of L2 speech: Accentedness, intelligibility, comprehensibility

A number of previous studies have been conducted regarding perception of learners' speech (Flege 1988, Flege et al. 1995, Magen 1998, Munro and Derwing 1995, Bradlow and Bent 2008 among others). The three measures used to evaluate speakers' pronunciation are accentedness, intelligibility, and comprehensibility, which are correlated, though not on a par. Accentedness refers to the extent to which an L2 learner's speech is perceived to differ from native norms (Munro and Derwing 1995, Riney et al. 2005), while intelligibility denotes the extent to which an utterance is actually understood by a listener. Intelligibility is often contrasted with comprehensibility, which refers to the perception of the degree of difficulty in understanding a non-native speaker (Derwing and Munro 1997, 2005). Moreover, intelligibility is often measured from transcription tasks, while comprehensibility is measured using judgment tasks.

Recently, a number of studies have focused on English learners' accented pronunciation. However, most studies investigating accented speech production have examined only accentedness (Magen 1998, Flege et al. 2006, Maeda and Yoneyama 2015), or combined accentedness and comprehensibility (Kang 2010, Yom 2011, Trofimovich and Isaacs 2012). Studies such as Derwing and Munro (1997) and Munro and Derwing (1995, 1999) have shown that high accentedness does not necessarily mean low comprehensibility. Evaluation of accentedness was often more severe than that of comprehensibility, and even for fully intelligible speech, accentedness ratings differed to a certain degree. This study concentrates on the comprehensibility of EFL learners to examine the degree to which Korean university students improved in comprehensibility over a decade.

2.2 Factors affecting listeners' judgment: Segmentals vs. suprasegmentals

As far as the relative contribution of segmentals and suprasegmentals to L2 perception is concerned, there is little agreement, even though the role of suprasegmentals is considered more significant. While some studies suggest that suprasegmental aspects are more important (Anderson-Hsieh and Koehler 1988, Anderson-Hsieh et al. 1992, Munro and Derwing 1999, Boula de Mareuil and Vieru-

Dimulescu 2006), others suggest a primary role for segments (e.g., Jilka 2000, Lee 2013, Sereno et al. 2016). Sereno et al. (2016) suggest that segmental information contributes substantially more to the perception of foreign accentedness than intonation, which means that native speakers seem to rely mainly on segments when determining foreign accentedness. Park and Park (2014) conducted an experiment and claimed that segmentals and suprasegmentals are both positively correlated with comprehensibility, although the latter are more influential than the former. Yom (2011) examined the effects of acoustic parameters of pitch, duration, and intensity on comprehensibility and foreign accent. In this study, the most important feature is taken to be intensity, followed by pitch; however, duration is taken to have no contribution to comprehensibility.

Trofimovich and Baker (2006) attempted to prove the role of prosody in the perception of L2 speech and examined six factors - stress timing, tonal peak, alignment, speech rate, pause frequency, and pause duration - in relation to foreign accented ratings of Korean L2 speech. They suggested that prosodic features contributed to the judgment of foreign accent: Speech rate, pause frequency, and pause duration were more influential than stress-timing and peak alignment. Along similar lines, Kang (2010) examined the relative contribution of prosodic features to listeners' judgments on L2 accentedness and comprehensibility. The results demonstrated the independent contribution of prosodic features: Comprehensibility ratings were mostly associated with speaking rates, while accentedness was most affected by pitch range and word stress measures.

Dealing with Korean speakers of English, Lee (2013) conducted an experiment to investigate the relative contribution of prosody and segments to accentedness and comprehensibility. Following Boula de Mareuil and Vieru-Dimulescu (2006) and Magen (1988), she synthesized prosodically-distorted L1 and prosodically-corrected L2 speech to examine the role of prosodic parameters. Based on the results that the synthesized L1 and L2 speech did not show significant differences from L1 and L2 speech, she claimed that segments played a more dominant role than prosody. Lee's study is not conclusive, however, since the prosodic features examined in her study were only pitch, duration, and intensity, which do not show a significant role in other studies such as Trofimovich and Baker (2006). This suggests relative weight on speech rate over intonation in the assessment of foreign accent.

With divergent findings on the relative roles of suprasegmentals and segmentals, this study will compare the comprehensibility ratings and acoustic measures of pitch,

duration, intensity of vowels, speech rate, and pitch range.

3. Methodology

3.1 Participants

The participants of this study were divided into three groups: 19 (male 10, female 9) Korean students who entered university in 2000 (hereafter Group 2000), 19 (male 10, female 9) Korean students who entered university in 2012 (hereafter Group 2012)¹, and 10 native English speakers, used as a rater group (NE). The Korean groups were further divided by gender, such as 2000M (male) and 2000F (female).

All the Korean students were aged 21–25 and were sophomores taking a required course, Phonetics, in the English department at a university in Incheon. Both Groups of 2000 and 2012 were ranked at the top 13th percentile of the Korean national SAT, which means they are in the same relative ranking in general scholastic ability among all test takers in their entrance year. None of them had been to an English-speaking country for more than three months (as students with extensive experience in a foreign country had been excluded). Evaluation of their English proficiency was taken from the class placement test and showed them to range from intermediate to high intermediate. TOEIC scores for Group 2012 ranged from 750 to 850 but TOEIC scores were not available for Group 2000².

3.2 Recordings and measurements

The recordings used for the native speakers' judgment task and their acoustic measurements were extracted from the corpus collected for Yoo (2016). Yoo (2016) analyzed 80 students' recordings of a diagnostic passage composed of 11 sentences in Prator and Robinett (1985). The recordings were measured using Praat 5.1.31 and

¹ Originally, there were equal numbers of male and female speakers. While the experiment was being conducted, one female student was excluded from each group in the statistics.

² Anonymous reviewers criticized the lack of homogeneity of English proficiency between Group 2000 and Group 2012. However, the purpose of the study is not to investigate the comprehensibility of the cohorts at the same English level. Rather, we have studied the comprehensibility difference between the cohorts (2000 and 2012), who were in the same percentile in SAT.

calculated in the three acoustic correlates of stress (pitch, duration, and intensity), pitch range, and speech rate. As for the correlates of stress, the mean ratios of stressed to unstressed vowels were calculated for pitch, duration, and intensity: For example, duration ratio was calculated in the following way: the average duration of stressed vowels in each clause or sentence was divided by the average duration of unstressed vowels in the same sentence. Pitch range was calculated by subtracting the lowest from the highest F0 in a clause or sentence. Speech rate was measured by the number of syllables per second for each sentence.

For the present study, the recordings and the measurements of the first five sentences (See Appendix A.) of 40 students were extracted from the corpus. Each sentence recording was saved as a separate file. The alpha coefficient for the five sentences was .991, suggesting that the items have relatively high internal consistency.

3.3 Rater participants

The raters comprised ten native English speakers, eight American and two Canadian, with American English accents. They consisted of three female and seven male speakers aged 27–37, who were working as English instructors in a university. Among the American speakers, three were from the Southwest, one from the Northeast, two from the North, and two from the East. The Canadian speakers were from the middle area of Canada. All of them hold a master's degree: Two of them have a linguistics background, and the rest do not. There was a relatively high inter-rater reliability: the alpha coefficient for the ten raters was .834.

3.4 Comprehensibility rating scales

The questionnaire employed a 7-point bipolar scale (1 = hard to understand, 7 = easy to understand) adapted from Derwing and Munro (1997) for the assessment of three aspects: segmental, suprasegmental, and general. It also included a comment box next to each comprehensibility scale (See Appendix B.).

3.5 Procedures

At a quiet office, the raters completed a brief rater background questionnaire including age, gender, contact information, nationality, etc., and a consent form.

Afterwards, the rating and marking procedure were explained to them and raters practiced with a student's recording with the coordinator. Raters listened to each recording file and rated accordingly. However, the first sentence was quite a long sentence consisting of three clauses, and raters were asked to evaluate each clause separately. There was a 20-second break between each file for the raters to complete marking³.

After they had rated their comprehensibility, they were asked to circle the problematic areas including consonants, vowels, deletion, and insertion for segmentals, and stress, pause, rhythm, and intonation for suprasegmentals. Checklists for consonants were mostly [r] vs [l]; vowels were [i] vs [I], [ɛ] vs [æ], [u] vs [ʊ]; deletion cases included, for example, [d] deletion from 'spend'; insertion cases included, for example, vowel insertion as in [lʊlkɪd] 'looked.' The circled comments were counted.

If the raters could not finish marking in the time allotted, they were allowed a longer pause, but they were not allowed to listen again. They took 72 minutes on average.

3.6 Data analysis

To investigate the research questions, various t-tests, the ANOVA tests, and a stepwise multiple regression analysis were employed using SPSS 23.

4. Results

4.1 Comprehensibility

Figure 1 shows the mean comprehensibility ratings for segmentals, suprasegmentals, and general comprehensibility. There were 1330 tokens in total (19 speakers × 7 sentences × 10 raters).

³ An anonymous reviewer criticized that raters were to mark both segmentals and suprasegmentals after only listening one time. However, they did it without any difficulty.

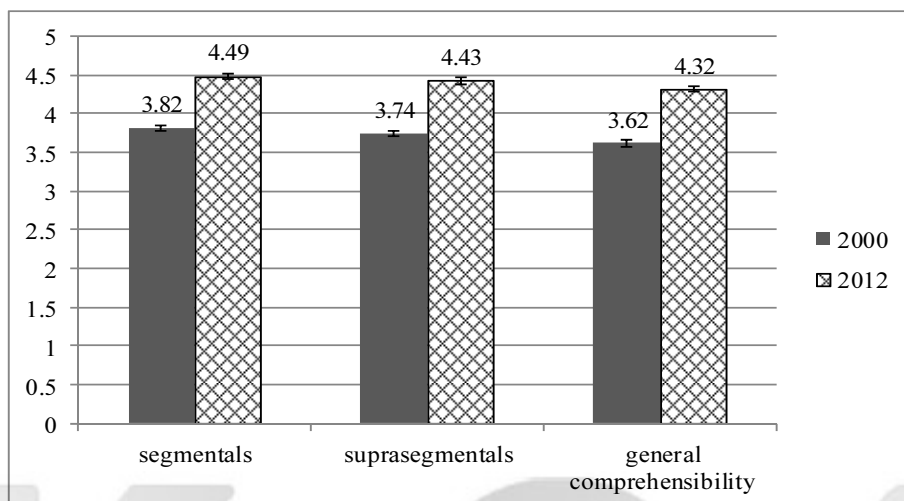


Figure 1. Mean ratios of comprehensibility

The independent samples t-tests indicate that the differences between the groups of 2000 and 2012 are significant at all three levels, as in Table 1.

Table 1. Results of independent samples tests

	year	N	mean	SD	t	df	p
segmentals	2000	1328	3.82	1.26	11.568	2653	0.000
	2012	1327	4.49	1.26			
suprasegmentals	2000	1328	3.74	1.27	11.299	2654	0.000
	2012	1328	4.43	1.37			
general comprehensibility	2000	1330	3.58	1.08	14.405	2658	0.000
	2012	1330	4.34	1.19			

The data show that comprehensibility improved from 2000 to 2012 in all areas of segmentals, suprasegmentals, as well as in general. It is noticeable that the ratings for general comprehensibility are significantly lower than the ratings for segmentals ($p = .000$) and suprasegmentals ($p = .000$), whereas the difference between segmentals

and suprasegmentals is not significant ($p > .05$)⁴.

To investigate the gender effect, the obtained comprehensibility ratings were submitted to a two-way ANOVA with year and gender as independent factors: Regarding ratings for segmentals, the ANOVA revealed main effects of year ($F(1, 260) = 81.782, p = .000$), gender ($F(1, 260) = 24.318, p = .000$), and interaction ($F(1, 260) = 18.927, p = .000$). 2012F received higher ratings than the male group 2012M ($p = .000$). The interaction was due to the fact that the female group had greater improvement than the male group as shown in Figure 2.

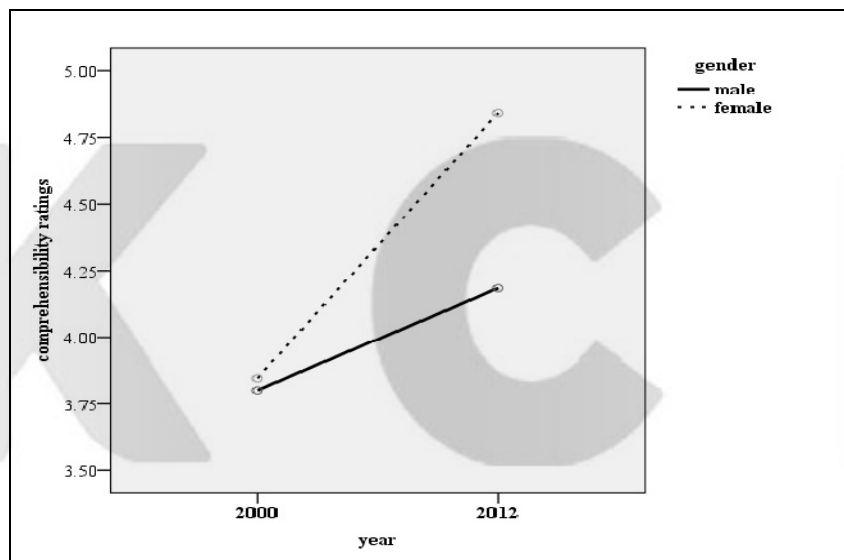


Figure 2. Changes in segmental comprehensibility over time

As for suprasegmentals and general comprehensibility, similar patterns emerged. The ANOVA revealed main effects of year ($F(1, 260) = 79.581, p = .000$), gender ($F(1, 260) = 39.967, p = .000$), and interaction ($F(1, 260) = 19.262, p = .000$) for suprasegmentals. For general comprehensibility, the ANOVA analysis revealed main effects of year ($F(1, 260) = 119.287, p = .000$), gender ($F(1, 260) = 69.954, p = .000$), and interaction ($F(1, 260) = 33.071, p = .000$). The results imply that for both

⁴ There is a gender difference in the pattern, which will be dealt with later in the discussion of gender effect.

suprasegmentals and general comprehensibility, Group 2012 showed higher comprehensibility than Group 2000, while 2012F showed higher ratings than 2012M. It also implies that 2012F showed more improvement than 2012M. As discussed above, although both genders showed a great improvement over a decade, female students improved more. One interesting point is that a divergent gender effect emerged in the difference of degrees of improvement between segmentals and suprasegmentals. Female students showed a relatively higher improvement in general comprehensibility (1.15) and suprasegmentals (1.10 point) than segmentals (1.02).

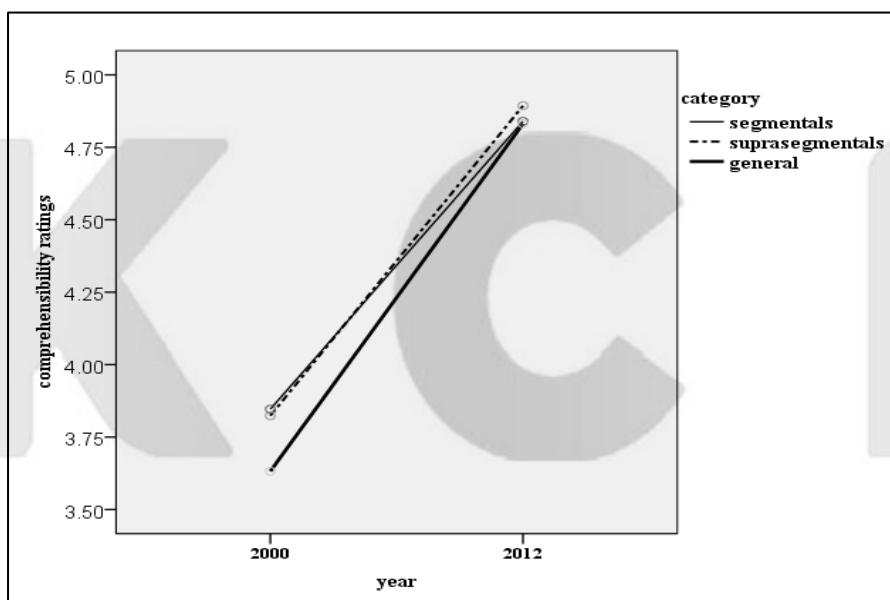


Figure 3. Changes in comprehensibility over time: Female students

On the other hand, male students showed a parallel ascending slope, as shown in Figure 4. They showed a lesser degree of improvement: 0.36 for segmentals, 0.38 for suprasegmentals, and 0.36 for general. Male students improved their segmentals and suprasegmentals to almost the same degree, resulting in the parallel pattern.

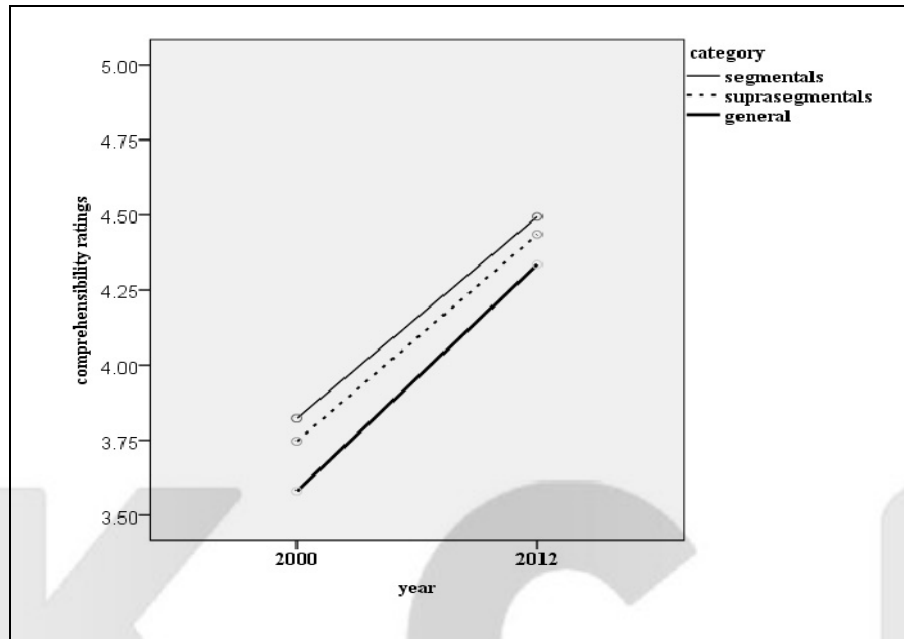


Figure 4. Changes in comprehensibility over time: Male students

Summing up the changes over time between segmentals and suprasegmentals, female students improved from 2000 to 2012 in suprasegmentals more than segmentals, whereas male students did not show as much difference.

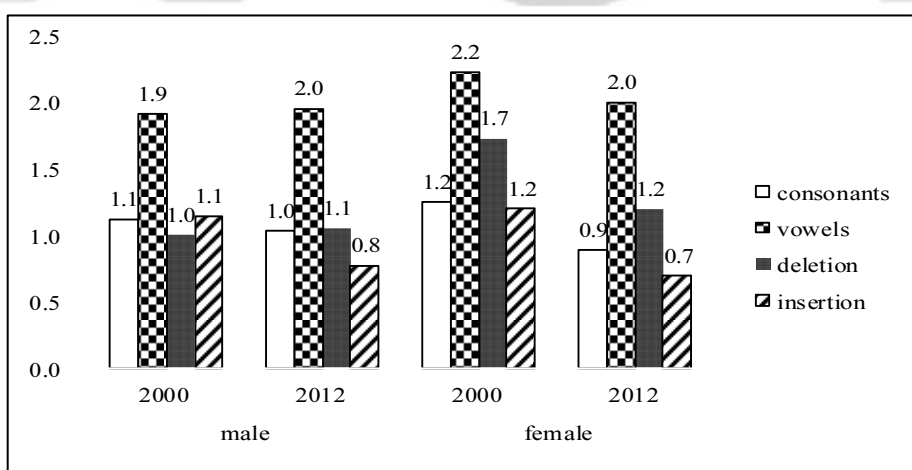
4.2 Problem areas

The total number of areas that the raters marked as problematic was 2075 out of 10640 (38 students x 10 raters x 7 sentences x 4 areas) for segmental and 2569 for suprasegmentals. As seen in Table 2, the comments show an interesting pattern: Overall, raters appeared to mark more in suprasegmental than in segmental areas, which indicates that suprasegmentals are more difficult for students. Female students showed a greater decrease in the number of marking at the segmental level than did male students (0.3 vs 1.5). A gender difference also appeared at the suprasegmental level (0.8 vs 2.2).

Table 2. Cases of problem areas for comprehensibility

	gender	year	No. of problem areas/person	Total
segmental	male	2000	5.1	2075
		2012	4.8	
	female	2000	6.3	
		2012	4.8	
suprasegmental	male	2000	7.1	2569
		2012	6.3	
	female	2000	7.9	
		2012	5.7	

Investigating specific areas of difficulty mentioned in the comments box revealed that English native speakers deem vowels to be the most problematic area among the four areas of consonants (r/l), vowels, deletion, and insertion, as shown in Figure 5. Korean speakers do not distinguish some vowels such as [i] vs [I], [ε] vs [æ], [u] vs [o], which account for approximately 43% of variance in segmental errors. Insertion has reduced drastically from 2000 to 2012 for both genders but deletion and consonants have reduced for female students only.

**Figure 5. Means of segmental errors per person by error type**

Considering suprasegmentals, pause was not regarded as a problem. This is a significant point since in other studies (Trofimovich and Baker 2006, Yom 2007, Kang 2010), pause has been one of the most important variables in determining comprehensibility. This may be attributable to the experimental method, which was read-speech. Since students read the diagnostic passage, they did not use frequent or long pauses as they might have done in spontaneous speech. For male groups, intonation was the worst area in 2000, but the number decreased by 0.6. Stress also improved, decreasing by 0.3. However, there was no noticeable change for pause, while rhythm got worse (0.2). On the other hand, female students of 2012 revealed improvements in every area: The number of comments was less than that in 2000 by 0.4 per person, as demonstrated in Figure 6.

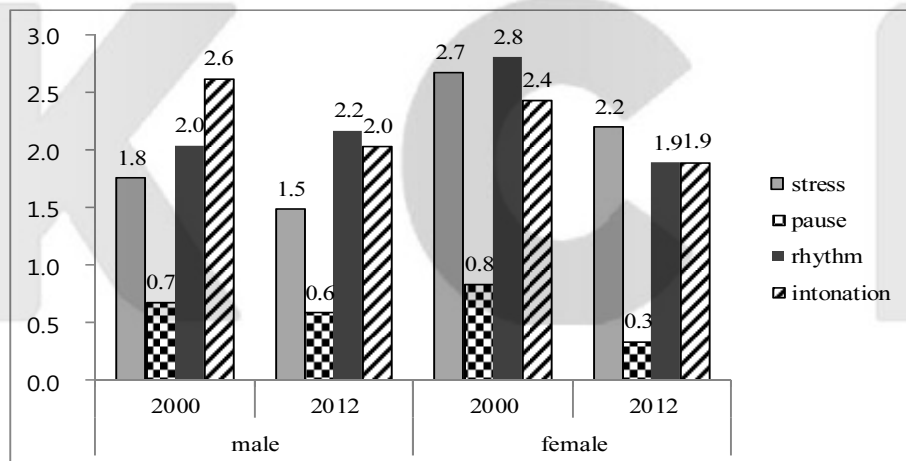


Figure 6. Means of suprasegmental errors per person by error type

From the analysis of problem areas, we found that there has been a considerably higher degree of improvement in suprasegmentals than segmentals. From the finding that the female group that showed higher comprehensibility also had fewer comments on suprasegmentals, we can conclude that comprehensibility is correlated more with suprasegmental features.

4.3 Relative impact of prosodic features on comprehensibility

As reviewed above, many studies have investigated factors that impact comprehensibility judgment. This section will examine the relative contributions of suprasegmental features to comprehensibility.

First, to clarify the relative influence of segmentals and suprasegmentals on sentence comprehension, a multiple regression analysis was performed as shown in Table 3. The dependent variable is general comprehensibility and the independent variables are segmentals and suprasegmentals.

Table 3. Multiple regression analysis

variable	Beta(β)	t-value	sig. p	Partial correlation
segmentals	.363	6.365	.000	.365
suprasegmentals	.556	9.745	.000	.515
R=.891 R ² =.794 F= 60.239 p=.000				

As shown above, suprasegmentals contributed to the prediction of variance in comprehensibility ($\beta = .556$) more than segmentals ($\beta = .363$), which confirmed the relative influence of suprasegmentals on comprehensibility.

Since suprasegmentals turned out to be the more influential, this section will examine the relative impact of suprasegmental features on comprehensibility. Table 4 shows the means of five suprasegmental features and their T-test results between Group 2000 and Group 2012. The total number of cases is 133 for each year (19 speakers x 7 sentences).

Table 4. Statistics of suprasegmental features by year

	group	N	mean	SD	t	df	p
pitch ratio	2000	133	1.00	.13	.732	262	.465
	2012	132	.98	.17			
duration ratio	2000	133	1.31	.30	-5.274	263	.000
	2012	132	1.70	.79			
loudness ratio	2000	133	1.01	.02	.296	263	.768

	2012	132	1.01	.04			
pitch range	2000	133	88.62	69.53	-1.493	263	.137
	2012	132	102.66	82.99			
speech rate	2000	133	3.98	.79	-3.968	263	.000
	2012	132	4.38	.86			

The t-test results indicate that there is a significant difference between Group 2000 and Group 2012 in duration ratio and speech rate⁵. A stepwise multiple regression analysis was performed to examine the relative effects of the acoustic features on native speakers' comprehensibility judgment. The dependent variables were the general comprehensibility judgment while the predictors were the five suprasegmental variables.

Table 5. Final model summary of stepwise multiple regression of suprasegmental variables on comprehensibility

Supra-segmentals	Beta(β)	t-value	sig.	Partial cor.	step entered	R	R ² change
pitch ratio	-.081	-1.296	.196	-.082	1	.219	.048
loudness ratio	-.061	-1.057	.291	-.067	2	.226	.003
pitch range	.110	2.026	.054	.121	3	.258	.016
duration ratio	.266	4.403	.000	.268	4	.332	.044
speech rate	.341	6.031	.000	.356	5	.472	.113

Table 5 reveals the final model summary of the stepwise multiple regression of suprasegmental factors on comprehensibility ratings. Five regression models were significant ($F(5, 251) = 14.393, p = .000$). Among the features, speech rate and duration contributed to the prediction of variance in comprehensibility ratings. Pitch

⁵ In Yoo (2016), there was a significant difference in intensity and pitch range, even though there was some gender effect: For example, female learners showed a significant change in pitch range, but no significant change in intensity.

range was marginally related to comprehensibility ($p < .1$). Pitch and loudness do not seem to play a role in comprehensibility.

The negative value for pitch ratio can be explained by a difference in pitch peak alignment between Korean and English (Trofimovich and Baker 2006): Pitch peak in Korean is typically phrase-final, occurring on the last word on an accentual phrase (Jun 1998, Lee 2013), while pitch peak in English is usually aligned with the onset of the stressed syllable (Ladd et al. 2000). Therefore, the ratio of stressed to unstressed vowels appeared to be different from English, which would interfere with native speakers' comprehension.

The findings confirm previous studies on speech rate (Munro and Derwing 2001, Trofimovich and Baker 2006, Kang 2010) that speech rate is more related to comprehensibility and accentedness. The findings do not confirm Warren et al. (2009), which claimed that comprehensibility ratings are more correlated with sentence prosodic factors such as sentence stress, intonation, and rhythm, than with fluency based factors such as speech rate and pause.

5. Conclusion

This study attempted to answer questions related to Korean students' improvement in comprehensibility for English speech over a decade and the relations between acoustic measurements of their suprasegmentals.

Comprehensibility judgment ratings revealed that Korean students have improved their comprehensibility significantly over a decade in all areas of segmental, suprasegmental, and general comprehensibility. As the purpose of English pronunciation education is to improve comprehensibility, this improvement can be seen as a success for English education.

A close look at the data showed gender differences in many respects. First, the comprehensibility of the female group of 2012 was much higher than that of the male group of 2012 (4.87 vs 3.89), whereas the gender difference was not as large for Group 2000 (3.71 vs 3.53). This gap for Group 2012 can be seen as the result of a greater improvement for female students than for male⁶ (1.16 vs 0.36).

Second, female students have improved suprasegmentals (1.10) more than

⁶ The reason for the relatively greater improvement of female speakers is beyond the scope of this research.

segmentals (1.02), whereas male students showed improvement of 0.36 for suprasegmentals and 0.38 for segmentals. The gender difference can be regarded as evidence for the more prominent role of suprasegmentals in comprehensibility.

In judging comprehensibility, the raters chose elements that interfere with understanding. Students from 2012 showed the hierarchy of difficulty at the segmental level to be vowels > deletion > consonants > insertion. Vowels have not improved since 2000, and insertion has drastically reduced. This result can be expected due to the teaching approach that avoids accuracy-based lessons. As for suprasegmentals, the hierarchy of difficulty is rhythm > intonation > stress > pause. Female students improved in all areas of suprasegmentals, while intonation and stress were the only areas of improvement for male students.

Another purpose of this study was to examine the relative importance of segmentals and suprasegmentals on comprehensibility, since there is little agreement (Park and Park 2014, Sereno et al. 2016). This study supports the pre-eminence of suprasegmentals over segmentals based on coefficients of a regression analysis; the general comprehensibility turned out to be more correlational with suprasegmentals ($\beta=.556$) than segmentals ($\beta=.363$)⁷.

Finally, this study investigated the relative impact of five suprasegmental features – pitch ratio, duration ratio, loudness ratio, pitch range, and speech rate – on comprehensibility. According to the stepwise multiple regression, the relative contribution of the suprasegmental factors to comprehensibility judgment is as follows: speech rate > duration ratio > pitch range > loudness ratio > pitch ratio. This result supports the superiority of speech rate in perception (Munro and Derwing 2001, Trofimovich and Baker 2006, Kang 2010) and rejects the view that prosodic factors such as sentence stress, intonation, and rhythm are more important than speech rate (Warren et al. 2009).

In conclusion, this study provides evidence for the relative role of prosodic features that are derived not merely from a cross-sectional method. This study not only sheds light on the development in abilities of Korean EFL students over decades, but also upon the influence of prosodic features in comprehensibility in general.

⁷ Nevertheless, as shown in the problem areas chosen by native speakers, vowels, which are segmental, are also a factor affecting comprehensibility. Therefore, it cannot be said that only suprasegmentals play an absolute role.

Appendix A: Passage for recording

(1) When a student from another country comes to study in the United States, he has to find out for himself the answers to many questions, and he has many problems to think about. (2) Where should he live? (3) Would it be better if he looked for a private room off campus or if he stayed in a dormitory? (4) Should he spend all of his time just studying? (5) Shouldn't he try to take advantage of the many social and cultural activities that are offered?

Appendix B: Questionnaire

1. Rater information

1. Name	2. Age
3. Dialect of English (Country)	4. Length of Stay in Korea
5. Gender	

2. Sentence Rating

	Criterion	Scale of comprehensibility	Comments		
1	Seg-mentals	hard to understand	easy to understand	consonants	vowels
		1 2 3 4 5 6 7		deletion	insertion
	Supra-seg.	hard to understand	easy to understand	stress	pause
		1 2 3 4 5 6 7		rhythm	intonation

3. General comprehensibility

No.	Scale of comprehensibility
1	hard to understand
	easy to understand
	1 2 3 4 5 6 7

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