Korean English Teachers' Perceptions of Intelligibility and Comprehensibility towards Erroneous Phonemes: In Terms of Functional Load and Attitude[*]

Kyungmi Kang[**] · Hyunsong Chung[***]

《 요 약 》

   This study aims (1) to investigate Korean English teachers' (KET) intelligibility and comprehensibility of typical erroneous phonemes of Korean English speakers and (2) to discover the effect of teachers' attitudes on comprehensibility grading. The erroneous phonemes were classified in terms of functional load (FL) and syllabicity to specifically identify the difference. Native speakers' data were used as a baseline to find KETs' traits. In the intelligibility task, the high FL affected only the KETs negatively when the erroneous phonemes were vowels. However, in the comprehensibility task, the negative influence of the high FL was not significant for KETs. Instead, the scores were invariably higher for words with vowel errors. The research findings suggest that KETs made the wrong assumption that they comfortably understood words with high FL vowel errors. Regarding the effect of teachers' attitude, KETs with low willingness to accept World Englishes (WEes) in class gave significantly lower scores to the words with high FL errors when they were vowels. Given the lower intelligibility score for the error type, the stricter grading of the low WEes acceptance group appears to be more valid. The findings suggest that KETs might make misjudgments on pronunciation errors due to their overly high WEes acceptance tendency.

   Key words : Phoneme error, Intelligibility, Comprehensibility, Functional load, Attitude

Ⅰ. Introduction

The huge participation of non-native speakers (NNS) in English communication led to the shifting ownership of English. That is, NNSs are believed to have an equal piece of English ownership as much as native English Speakers (NES), implying the different varieties of English NNSs locally have developed are accepted as legitimate English models. Pronunciation education, in particular, is susceptible to the discussion about English variations since NNSs' different language backgrounds are best manifested in verbal interaction. From the pluralistic view, to achieve native-like pronunciation is an impossible goal for the majority of learners, and to do so only frustrates them. Therefore, instead of asking learners to reduce their regional accents, teachers advise students to improve intelligibility and comprehensibility in the new English frame (Jenkins, 2002; Levis, 2005).

Although there are some pedagogical research which give teachers insights for setting a realistic pronunciation teaching goal, pronunciation instruction (PI) has taken a backseat in Korean English education, although some studies on Korean speakers' errors of spoken English can be found (Choi & Chung, 2007; M. Kim, 2019). Korean English teachers (KET) understand that PI, as well as other English skills, is an integral part of education for fostering students communication ability (M. Chung, 2010; J.-K. Park, 2009), but they do not sufficiently give PI in their actual teaching practice (H. Chung & Chung, 2008). The main reason for the near absence of PI proven from the previous research was the time constraints to go over extensive learning objectives. Teachers showed a tendency to compromise teaching objectives by neglecting PI. Along with the unfavorable contextual factor, teachers' individual attitudes, also, can have an influence on how pronunciation teaching and evaluation are carried out. Among others, how much teachers are open to World Englishes (WEes) affects PI more than any other English teaching pedagogies. For instance, H. S. An (2017) asked in-service teachers about their awareness of WEes and found its correlation with the evaluation standard. In grading learners' oral proficiency and pronunciation, teachers with high awareness of WEes were more likely to consider the Korean variety acceptable.

Not properly providing PI, teachers may expect the implicit pronunciation learning would happen in class. Unfortunately, the effect of implicit PI has been proved to be questionable. For example, in the study of Gordon and Darcy (2016), only the group which received the explicit instruction about pronunciation demonstrated improvement although implicit learning group was provided with same learning content. Since teachers and students share the first language, the problematic pronunciation is more likely to be fossilized if not treated explicitly and promptly. In the need for diagnosing and

attending to learners' problematic pronunciation, KETs need to have a good level of sensitivity to the erroneous pronunciation. Therefore, this study investigates KETs' intelligibility and comprehensibility for erroneous words. For finding out KETs' characteristics, NESs' data are used as a baseline to compare. Furthermore, the effect of their attitudes towards WEes on comprehensibility grading is also examined. The research questions of this study have been set as follows:

1. Do intelligibility and comprehensibility of KETs and NESs vary depending on the phoneme errors' different levels of functional load (FL) and syllabicity?

2. Does the KETs' comprehensibility rating on phonemic errors differ depending on their attitudes towards WEes?

II. Literature Review

1. Constructs of pronunciation

Defining constructs of pronunciation lends support to the educators to decide what aspects need attention in PI. Munro and Derwing (1995) posited three constructs of pronunciation: intelligibility, comprehensibility, and accentedness. They referred to intelligibility as the extent to which the utterance the speaker intended to deliver is actually understood, comprehensibility as the degree of effort the listener needs to comprehend the utterance, and accentedness as the degree the listener feels about how much the utterance has deviated from a native-norm pronunciation. The categorization of intelligibility, comprehensibility, and accentedness was employed in designing a great deal of pronunciation research in applied linguistics and language education. This study uses their three dimensions to answer the research questions as well.

Furthermore, it has been empirically proven that intelligibility and comprehensibility are better indicators for successful communication than the accentedness (Derwing & Munro, 1997; Munro & Derwing, 1995). In the study of Derwing and Munro (1997), NESs in Canada measured intelligibility, comprehensibility, and accentedness of NNSs' speech. They referred to intelligibility as the extent to which the utterance the speaker intended to deliver is actually understood, the comprehensibility as the degree of effort the listener needs to comprehend the utterance, and accentedness as the degree the listener feels about how much the utterance has deviated from a native-norm

pronunciation. The results presented that the correlation between intelligibility and comprehensibility was stronger than intelligibility and accentedness. Likewise, in ELF paradigm, it has been strongly argued that achieving a native-like accent can not be a reasonable learning goal for NNSs due to the improbability and impracticality of reaching NES' level of phonological control (Levis, 2005). Therefore, it is safe to say that KETs responsibility is to improve learners' intelligibility and comprehensibility of pronunciation rather than attempt to reduce their Korean regional accents.

2. Functional load

According to FL theory, segmental errors have a detrimental impact on intelligibility and comprehensibility, but not all the segments bear an equal amount of the effect. Certain segmental errors more negatively affect the listener's comprehension (Brown, 1988; Catford, 1987). For instance, the substitution of /l/ for /r/ is said to have higher FL than /d/ for /ð/ since there are more minimal pairs of /l/ and /r/, and they occur frequently.

Acknowledging the practical use of FL in English education, Munro and Derwing (2006) conducted a study to investigate the effect of phoneme errors carrying different FL values on comprehensibility. NESs' comprehensibility was hugely influenced by the high FL phonemes but not much by low FL phonemes. The accumulative negative effects of consonant errors, also, occur exclusively with high FL phonemes. In addition, Kang and Moran (2014) examined what pronunciation features differentiated the levels of the Cambridge ESOL Test. High FL consonant and vowel errors decreased noticeably in a higher proficiency level, but low FL errors did not show a significant difference. Suzukida and Saito (In press) showed similar results. The findings demonstrated significant negative correlations with the comprehensibility grading in overall segmental substitutions, high FL substitutions, and high FL consonant substitutions. On the contrary, substitutions of low FL consonants, high FL vowels, and low FL vowels were not significantly correlated with the degree of comprehensibility.

These articles give a clue to the foreign language teachers about which phonemes should be prioritized in a situation they have limited opportunities to tackle the phonological problems. However, there is a lack of experiments that probe whether proficient non-native speakers such as KETs also perform similarly with NESs on an intelligibility and comprehensibility task which involves words with different values of FL. Thus, this research tries to fill the research gap by comparing the responses of KETs and NESs to the erroneous phonemes. For the language stimuli, segments

problematic for Korean English learners were categorized considering the FL. Besides, syllabicity – whether the segment was a consonant or vowel – was taken into consideration as the studies of Kang and Moran (2014) and Suzukida and Saito (In press).

3. Familiarity issue

Intelligibility and comprehensibility of speakers are determined by the characteristics of listeners as well as the acoustic property of speakers' utterances. One of the crucial listener variables that come into play in mutual intelligibility is the listeners' familiarity with a regional accent, and yet the findings of studies are not conclusive.

Bent and Bradlow (2003) found out the interlanguage speech intelligibility benefit among NNSs who share their first language. Recordings of Chinese, Korean, and English speakers' sentence reading were used as language stimuli in a recognition task. In the task using NNSs' recordings, NNS listeners sharing the same first language showed comparable intelligibility with NESs. Additionally, Weber, Broersma, and Aoyagi (2011) found the interlanguage benefit on the word level by a recognition task in which Japanese and Dutch English speakers participated. Dutch and Japanese bring about English phonological variations that are quite distant from each other. For example, the English word 'move' is likely to be pronounced as /muv/ by Dutch speakers and /mubʊ/ by Japanese speakers. Suggesting the positive language background effect, /muv/ and /mubʊ/ facilitated the recognition of the English word 'move' for Dutch listeners and Japanese listeners respectively. Meanwhile, Smith, Hayes-Harb, Bruss, and Harker (2009) found the null effect of the language background. The language focus of the study was the first language transfer of German to the devoicing of final voiced obstruent (e.g., the tendency of Germans to pronounce 'cub' as /kʌp/ instead of /kʌb/). In the identification task, Germans and NESs choose the visual representation of English words pronounced in either German or American accent. The results indicated that German listeners found German-accented English less intelligible than American-accented English.

When it comes to the familiarity effect on listeners' comprehensibility, most of the research support the easiness of understanding speech with a familiar accent. Saito et al. (2019) conducted a study to understand which factor affects comprehensibility of foreign-accented speech. He revealed that lenient listeners tend to be ones who had first languages linguistically adjacent to the target speech, regularly used English in professional settings, and had a better knowledge of the importance of comprehensibility in English communication. On the contrary, Foote and Trofimovich

(2018) did not find the positive effect of familiarity on comprehensibility. In a study that engaged participants from Mandarin, French, Hindi, and English backgrounds, the matched first language exerted an effect only for Mandarin listeners, but the effect size was small. Moreover, the reported easiness of French listeners for French English speakers and uneasiness of French and Mandarin listeners for Hindi English speakers were not reflected in their comprehensibility rating.

Identifying how the effect of familiarity influences KETs' intelligibility and comprehensibility is a crucial issue since the positive familiarity effect might lead KETs to not appropriately perceive or grade typical Korean phonological errors. This study, thus, tries to find the familiarity effect by implementing an intelligibility and comprehensibility task.

4. Teachers' attitudes and their practice

Teachers develop different attitudes towards teaching through their life experience, learning history, and professional training. Whether their attitudes permeate their teaching practice is not straightforward, however. It depends on various contextual factors and their interactions (Borg, 2003). Though research has been fairly fruitful in understanding the relationship between teachers' attitudes and their practice, pronunciation teaching practice, in particular, was far less focused compared to other English teaching skills. Amongst diverse dimensions of teachers' attitudes related to PI, this study investigates the effect of KETs' willingness to accept world Englishes into class.

A paucity of research has investigated the effect of KETs' attitudes on pronunciation grading. One of them is the study of H.-J. Kim (2005). She examined the influence of listeners' attitudes towards WEes on the holistic and analytic speech rating. Listeners from the U.S., Korea, and Hong Kong graded the six speech samples produced by Korean English speakers. Even though the raters did not show statistically significant differences holistically, they exhibited distinctive patterns to evaluate the sub-parts of the speech. Raters with negative attitudes were much more attentive to the rate of speech, pronunciation, and grammar than raters with positive attitudes.

However, there are no other research conducted to probe the relationship between KETs' attitudes and their pronunciation grading except for aformentioned studies (H. S. An, 2017; H.-J. Kim, 2005). This study aims to narrow the research gap by observing the grading pattern of teachers who have different levels of willngness to accept WEes in class. Based on the results of the previous studies, KETs with a low level of WEes acceptance are expected to harshly grade the pronunciation errors.

Ⅲ. Method

1. Participants

Participants of this study were fifty-four KETs and thirty-six NESs. For recruitment, the snowballing technique was employed by which the researcher passed on the experiment information from one person to another in a relatively informal way. Since the experiment was conducted with online questionnaire form, participants could have the access easily without distance constraints.

Considering the fact that Korean speakers who produced language samples tried to use a North American English accent, NESs with the accent of the kind were recruited for controlling the familiarity issue. <Table 1> presents the summarization of participants' backgrounds. The data collecting period was one-month from July to August 2020.

<Table 1> Background information about participants

KET			NES		
Gender	Male	16	Gender	Male	14
	Female	38		Female	22
School	Middle school	13	Nationality	American	32
	High school	41		Canadian	4
Teaching experience	1-10 years	34	Age	10s	2
	11-20 years	19		20s	11
	Over 20 years	1		30s	15
				40s	1
				50s	2
				No response	5

2. Language stimuli

L2-ARCTIC, a spoken corpus of non-native English users, was used for attaining the language stimuli. It is publicly accessible at https://psi.engr.tamu.edu/l2-arctic-corpus/. In the corpus, two Korean males and females read the speech prompts of the Carnegie Mellon University ARTIC approximately for an hour. Orthographic and forced-aligned phonetic transcription was performed for the speech (Zhao et al., 2018).

The phonemes that Korean English learners tend to have problems with (J.-I. An & Chung, 2005; H.-Y. Lee & Hwang, 2016; S.-G. Park, 2004; Zhao et al., 2018) were selected and categorized according to the FL and syllabicity. For consonants, Brown's FL ranking was used. The substitutions ranked from 6 to 10 were considered to have high FL and those lower than 6 to have low FL. For vowels, the modified version of Catford's FL ranking was used since it dealt with American pronunciation. Phonemes ranking 51% and higher were grouped into high FL and the rest below low into FL (Munro & Derwing, 2006). Consequently, 4 types of error groups were created: high FL consonant, low FL consonant, low FL consonant, and high FL vowel error groups. <Table 2> presents the selected phonemes.

<Table 2> Target error substitutions

FL	Syllabicity	Phonemic substitution
High	Consonant	/f → p/, /r → l/, /g → k/, /ʃ → s/, /z → s/, /v → b/
Low	Consonant	/ð → d/, /θ → s/, /z → dʒ/
High	Vowel	/i → ɪ/, /ɔ → oʊ/, /ɑ → ʌ/
Low	Vowel	/u → ʊ/, /ɑ → ɔ/, /ɛ → æ/, /ɛ → eɪ/

The phonetic transcriptions L2-ARCTIC corpus provided were primarily used for finding words with target error substitutions. To find additional errors, the researcher manually searched for recordings, using Praat 6.1.06. Forty-eight words were collected as language stimuli, and fourteen correctly spoken words were embedded as filler items. All the data were checked by a native English speaker before the experiment.

3. Instruments and procedures

The instrument was composed of two sessions. Both KETs and NESs participated in the first session for the intelligibility and comprehensibility task, and only Korean teachers participated in the second session in which they completed a survey (appendix 1) asking about their attitudes towards WEes. The instrument was delivered to participants by a Questionpro link, an online software tool, which made it possible for participants to listen to language items as many times as they wanted in a place where they found comfortable.

For the first session, only the target words had been clipped from the recordings, but the duration

of the words was too short to be comprehended. Therefore, after the piloting test, several words surrounding the target word were clipped together. Participants watched an introduction video before they answered questions. They were told about the purpose of the study and the procedures to follow. It was advised to focus on the target word and ignore irrelevant factors such as surrounding words' errors, rhythm, or intonation when they rate on the comprehensibility.

For the intelligibility task, participants were asked to write out the word they heard into standard orthography (Derwing & Munro, 1997; Munro & Derwing, 1995). Upon completing the orthographic transcription, the intended word by the speaker was provided so that they could correctly gauge the difficulty of understanding the word. The comprehensibility task using a 5-point scale was immediately followed after the intelligibility task (1 = very difficult to understand, and 5 = very easy to understand).

In the second session, a survey about teachers' attitudes towards WEes was conducted. The survey items were adapted from the previous literature (H. S. An, 2017; M. Chung, 2010; J.-A. Lee, 2010; J.-K. Park, 2009; Shim, 2015; Sung, 2018). There were 9 questions, and the Cronbach Alpha of the items was .71, which represents sufficient internal consistency for the exploratory research.

4. Data analysis

For the intelligibility task, words correctly transcribed were counted and assigned a percent-correct score based on the proportion of the tested words. For example, if a participant had 6 words right out of 9 words with low FL consonant errors, the intelligibility score computed was 66.67. For the comprehensibility task, each listener' score gained by using a 5-point scale was averaged out for the target error type.

Later, Statistical Package for Social Science (SPSS 26) was used to analyze the data. Three-way mixed-design ANOVA was used to observe any statistically significant difference among factors, setting the errors' FL and syllabicity as within factors and the group as a between factor.

When there were any significant interactions among factors, follow-up tests of two-way ANOVA and one-way ANOVA were conducted. The reason for the follow-up tests was to qualify the result obtained from three-way ANOVA (Maxwell, Delaney, & Kelley, 2017). For example, suppose a three-way ANOVA involving a factor A, B, and C, and there was a statistically significant three-way interaction. When an ANOVA table generated by three-way ANOVA tells there is a two-way interaction between A and B, the value is calculated with the effect of third factor C averaged out.

However, it is important to recognize the two-way interaction between A and B is not consistent across two levels of C since the three-way interaction is identified. Thus, when there is a three-way interaction, it is said to be preferable to consider the two-way interaction within individual levels of other factors. The same logic applies for interpreting the main effect of each factor when there is a two-way interaction.

Ⅳ. Results and Discussion

1. Intelligibility

<Table 3> presents the descriptive statistics of the intelligibility score. As previous studies identified (Kang & Moran, 2014; Munro & Derwing, 2006; Suzukida & Saito, In press), both groups had difficulty understanding the erroneous words with high FL when they were consonants. Moreover, the mean difference between KET and NES group is noticeable with the high FL errors.

<Table 3> Descriptive Statistics for the intelligibility score

Error type	Group	Mean	SD	n
High FL consonant	KET	67.80	10.08	54
	NES	74.54	10.23	36
High FL vowel	KET	83.33	8.76	54
	NES	90.97	10.61	36
Low FL consonant	KET	91.98	6.97	54
	NES	89.51	7.00	36
Low FL vowel	KET	93.44	7.37	54
	NES	92.43	6.34	36

Three-way ANOVA was performed to find any statistically significant mean differences. <Table 3> shows that three-way interaction among the FL, syllabicity, and group was not statistically significant, $F(1, 88) = 0.03$, $p = .87$, indicating that the interaction between the FL and syllabicity did not vary across the different groups.

⟨Table 4⟩ Summary of three-way ANOVA for the intelligibility score

		Sum of squares	df	Mean square	F	Sig.
Tests of within-subjects effects	FUN	13878.77	1	13878.77	271.70	.00
	FUN * GROUP	1720.86	1	1720.86	33.69	.00
	Error(FUN)	4495.10	88	51.08		
	SYL	7131.62	1	7131.62	121.58	.00
	SYL * GROUP	30.18	1	30.18	0.51	.48
	Error(SYL)	5161.92	88	58.66		
	FUN * SYL	4109.83	1	4109.83	70.66	.00
	FUN * SYL * GROUP	1.66	1	1.66	0.03	.87
	Error(FUN*SYL)	5118.74	88	58.17		

FUN: functional load, SYL: syllabicity

Two-way ANOVA was followed for each group. ⟨Table 5⟩ shows that the interaction between the FL and syllabicity was statistically significant for both groups [KET: $F(1, 53)$ = 41.44, p = .001, NES: $F(1, 35)$ = 33.84, p = .001].

⟨Table 5⟩ Summary of two-way ANOVA for the intelligibility score

		Sum of squares	df	Mean square	F	Sig.
KET	FUN * SYL	2672.81	1	2672.81	41.44	.00
	Error(FUN*SYL)	3418.19	53	64.49		
NES	FUN * SYL	1644.37	1	1644.37	33.84	.00
	Error(FUN*SYL)	1700.55	35	48.59		

To find a main effect, one-way ANOVA was used at each level of syllabicity. First, high FL consonant and low FL consonant errors were analyzed to detect a main effect of the FL. ⟨Table 5⟩ shows that there was a statistically significant main effect of the FL for each group [KET: $F(1, 53)$ = 253.09, p = .001, NES: $F(1, 54)$ = 90.02, p = .001]. That is, both KET and NES group, the negative influence of high FL was substantial when the erroneous words were consonants.

⟨Table 6⟩ Summary of one-way ANOVA for the intelligibility score 1

		Sum of squares	df	Mean square	F	Sig.
KET	FUN	15776.24	1	15776.24	253.09	.00
	Error(FUN)	3303.77	53	62.34		
NES	FUN	4033.67	1	4033.67	90.02	.00
	Error(FUN)	1568.26	35	44.81		

Second, high FL vowels and low FL vowels were analyzed to detect a main effect of the FL. <Table 7> shows that there was a statistically significant main effect of the FL for KETs, $F(1, 53)$ = 50.31, p = .001, but not for NESs, $F(1, 35)$ = .72, p = .40.

<Table 7> Summary of one-way ANOVA for the intelligibility score 2

		Sum of squares	df	Mean square	F	Sig.
KET	FUN	2755.18	1	2755.18	50.31	.00
	Error(FUN)	2902.23	53	54.76		
NES	FUN	37.99	1	37.99	0.72	.40
	Error(FUN)	1839.57	35	52.56		

Put in other words, the high FL errors were detrimental to KETs' intelligibility whereas they were not for NESs. For making sense of high FL vowel errors, KETs seemed not to be able to exploit the advantage of having the same background language with the Korean speakers. The result is contradictory to the argument that the common first language background would enable listeners to interpret words even with markedly deviated phonological errors (Bent & Bradlow, 2003; Weber et al., 2011). Rather, NESs appear to make better use of the internalized phonological knowledge and compensate for pronunciation flaws of high FL vowel errors (Hongyan & Heuven, 2007; Smith et al., 2009).

2. Comprehensibility

<Table 8> presents the descriptive statistics of the comprehensibility score. For both groups, the score for high FL consonant errors is markedly lower than others. Moreover, NESs' lower score for low FL consonant errors is noticeable with high FL errors.

<Table 8> Descriptive Statistics for the comprehensibility score

Error type	Group	Mean	SD	n
High FL consonant	KET	3.24	0.45	54
	NES	3.05	0.41	36
High FL vowel	KET	3.85	0.44	54
	NES	3.85	0.52	36
Low FL consonant	KET	3.98	0.55	54
	NES	3.09	0.50	36
Low FL vowel	KET	3.92	0.48	54
	NES	3.93	0.41	36

〈Table 9〉 Summary of three-way ANOVA for the comprehensibility score

		Sum of squares	df	Mean square	F	Sig.
Tests of within-subjects effects	FUN	4.51	1	4.51	61.90	.00
	FUN * GROUP	2.59	1	2.59	35.52	.00
	Error(FUN)	6.42	88	0.07		
	SYL	25.90	1	25.90	313.17	.00
	SYL * GROUP	6.50	1	6.50	78.63	.00
	Error(SYL)	7.28	88	0.08		
	FUN * SYL	2.14	1	2.14	38.83	.00
	FUN * SYL * GROUP	2.65	1	2.65	48.02	.00
	Error(FUN*SYL)	4.86	88	0.06		

Three-way ANOVA was performed to find any statistically significant mean differences (Table 9). Three-way interaction among the FL, syllabicity, and group was statistically significant, $F(1, 88)$ = 48.02, p = .001, indicating that the interaction between the FL and syllabicity varied across the group factor.

〈Table 10〉 Summary of two-way ANOVA for the comprehensibility score

		Sum of squares	df	Mean square	F	Sig.
KET	FUN	8.71	1	8.71	101.57	.00
	Error(FUN)	4.55	53	0.09		
	SYL	4.03	1	4.03	43.19	.00
	Error(SYL)	4.94	53	0.09		
	FUN * SYL	5.97	1	5.97	110.80	.00
	Error(FUN*SYL)	2.86	53	0.05		
NES	FUN	0.11	1	0.11	2.07	.16
	Error(FUN)	1.87	35	0.05		
	SYL	24.31	1	24.31	364.86	.00
	Error(SYL)	2.33	35	0.07		
	FUN * SYL	0.01	1	0.01	0.20	.66
	Error(FUN*SYL)	2.00	35	0.06		

Two-way ANOVA was followed for each group. 〈Table 10〉 shows the interaction between the FL and syllabicity was statistically significant for KETs, $F(1, 53)$ = 110.80, p = .001, but not for NESs, $F(1, 53)$ = .20, p = .66. To NESs, there was a statistically significant main effect for the syllabicity,

$F(1, 53) = 364.86$, $p = .001$, but not for the FL, $F(1, 35) = 2.07$, $p = .16$. It suggests that the comprehensibility score varied according to whether the errors were consonants or vowels, and the FL factor did not mediate the grading. That is, the general lower score for the consonant errors was substantial for NESs regardless of the FL. The result is partly contradictory to the one of intelligibility, which revealed that the high FL had a significantly negative effect on the score of words with consonant errors. It is assumable that even though NESs were successful in understanding words with low FL consonant errors, a high cognitive load was required for comprehending the erroneous words due to their less familiarity with typical Korean-accented English errors (Matsuura, Chiba, Mahoney, & Rilling, 2014; Munro & Derwing, 1995).

<Table 11> Summary of one-way ANOVA for the comprehensibility score 1

		Sum of squares	df	Mean square	F	Sig.
KET	FUN	14.56	1	14.56	167.20	.00
	Error(FUN)	4.61	53	0.09		

One-way ANOVA was conducted within each level of the syllabicity for the KET group. First, high FL consonant and low FL consonant errors were analyzed to find a main effect of the FL. <Table 11> presents that there was a statistically significant main effect of the FL, $F(1, 53) = 167.20$, $p = .001$. That is, the negative influence of high FL was crucial when the erroneous words were consonants. It indicates that KETs harshly graded high FL errors when they were consonants. The strict grading for the error type was quite predictable since they struggled to understand words with high FL consonant errors in the intelligibility task.

<Table 12> Summary of one-way ANOVA for the comprehensibility score 2

		Sum of squares	df	Mean square	F	Sig.
KET	FUN	0.13	1	0.13	2.45	.12
	Error(FUN)	2.79	53	0.05		

Second, high FL vowels and low FL vowels were analyzed to find a main effect of the FL. <Table 12> shows that there was no main effect of the FL, $F(1, 53) = 2.45$, $p = .12$. Put differently, high FL vowel errors were not more detrimental to KETs' comprehensibility than low Fl vowel errors.

Although the unfavorable impact of high FL on intelligibility was apparent when the words were

vowels, KETs did not show any more annoyance for grading high FL vowel errors. It seems that the KETs' high familiarity with typical Korean-accented English errors positively affected the comprehensibility (Kang & Moran, 2014; Munro & Derwing, 2006; Suzukida & Saito, In press). Besides, Saito et al. (2019) noted, KETs' regular use of L2 and understanding the gravity of comprehensibility in communication might have led to KETs' lenient scoring. However, the advantage of the language background effect for comprehensibility might not always be helpful in education. It implies that KETs are likely to pass over the errors caused by the phonological convergence Korean English learners make to facilitate communications. It may promote the fossilization of pronunciation mistakes, which, in turn, hugely affect speech intelligibility (Jenkins, 2000).

3. The effect of KETs' attitudes for comprehensibility

To understand the effect of teachers' attitudes towards WEes, they were divided into 2 groups based on the survey they had participated in. By the mean score, teachers were grouped into either of the high or low willingness to accept WEes group. The result of the independent t-test confirmed that the mean difference between each group was statistically significant.

1) The effect of willingness to accept WEes in class

⟨Table 13⟩ shows the result of three-way ANOVA. Three-way interaction among the FL, syllabicity, and group was not statistically significant, $F(2, 52) = 1.81$, $p = .18$.

⟨Table 13⟩ Summary of KETs' three-way ANOVA (WEes acceptance)

		Sum of squares	df	Mean square	F	Sig.
Tests of within-subjects effects	FUN	8.64	1	8.64	100.34	.00
	FUN * GROUP	0.07	1	0.07	0.77	.38
	Error(FUN)	4.48	52	0.09		
	SYL	4.07	1	4.07	43.82	.00
	SYL * GROUP	0.11	1	0.11	1.19	.28
	Error(SYL)	4.83	52	0.09		
	FUN * SYL	6.02	1	6.02	113.39	.00
	FUN * SYL * GROUP	0.10	1	0.10	1.81	.18
	Error(FUN*SYL)	2.76	52	0.05		

Two-way ANOVA was followed for each group. <Table 13> shows that the interaction between the FL and syllabicity was significant for both groups [High group: $F(1, 25) = 75.78$, $p = .001$, Low group: $F(1, 27) = 41.67$, $p = .001$].

<Table 14> Summary of KETs' two-way ANOVA (WEes acceptance)

		Sum of squares	df	Mean square	F	Sig.
High group	FUN * SYL	3.68	1	3.68	75.78	.00
	Error(FUN*SYL)	1.21	25	0.05		
Low group	FUN * SYL	2.39	1	2.39	41.67	.00
	Error(FUN*SYL)	1.55	27	0.06		

To find a main effect of FL for the KET group, one-way ANOVA was conducted. First, high FL consonant and low FL consonant errors were analyzed to detect a main effect of the FL. <Table 15> shows that each group had a statistically significant main effect of the FL [High group: $F(1, 25) = 99.50$, $p = .001$, Low group: $F(1, 27) = 71.02$, $p = .001$]. That is, the negative influence of high FL was substantial when the erroneous words were consonants.

<Table 15> Summary of KETs' one-way ANOVA (WEes acceptance) 1

		Sum of squares	df	Mean square	F	Sig.
High group	FUN	7.15	1	7.15	99.50	.00
	Error(FUN)	1.80	25	0.07		
Low group	FUN	7.41	1	7.41	71.02	.00
	Error(FUN)	2.82	27	0.10		

Second, high FL vowels and low FL vowels were analyzed to find the main effect of the FL. <Table 16> shows that a statistically significant main effect was found for KETs in the low willingness to accept WEes group, $F(1, 27) = 7.97$, $p < .05$, but not in the high willingness to accept WEes group, $F(1, 25) = 0.02$, $p = .88$.

<Table 16> Summary of KETs' one-way ANOVA (WEes acceptance) 2

		Sum of squares	df	Mean square	F	Sig.
High group	FUN	0.00	1	0.00	0.02	.88
	Error(FUN)	1.65	25	0.07		
Low group	FUN	0.29	1	0.29	7.97	.01
	Error(FUN)	0.98	27	0.04		

Put differently, KETs with low willingness to accept WEes had more negative influence from vowel errors with the high FL. The findings resonate with the studies of H. S. An (2017) and H.-J. Kim (2005) which showed the positive relationship between KETs' amenable attitudes towards WEes and lenient scoring in pronunciation. In this experiment where KETs' intelligibility significantly suffered due to high FL vowel errors, the lower comprehensibility score of KETs in the low WEes acceptance group appears to be more appropriate.

Ⅴ. Conclusion

This study investigated how KETs and NESs performed differently in the intelligibility and comprehensibility tasks involving words with phonemic errors. Furthermore, how the KETs' different levels of the willingness to accept WEes would affect the comprehensibility grading was examined. The phoneme errors produced by Korean English learners were categorized according to the FL and syllabicity to locate where the significant mean difference occurred.

The FL affected the intelligibility scores differently when the words contained vowel errors. Only the KET group had a negative effect from the high FL. It indicates that KETs did not enjoy the interlanguage benefit for figuring out words with high FL vowel errors. Meanwhile, KETs' comprehensibility score for high FL vowel errors was not significantly different from the low FL vowel errors, suggesting that they were unduly tolerable. For the NES group, however, the pattern was the opposite. Even though NESs' intelligibility for words with high FL consonant errors was significantly lower than words with low FL consonant errors, the comprehensibility score was invariably lower for the consonant errors irrespective of the degree of FL. It implies that NESs needed more processing time to grasp words with low FL consonant errors. NESs' less familiarity with typical Korean phonological errors might have been attributable to the comprehensibility grading. With regard to the effect of teachers' willingness to accept WEes in class, teachers with low WEes acceptance group rated more critically on the high FL vowel errors. Considering KETs' struggle to understand words with high FL vowel errors, the stricter grading of KETs in the low WEes acceptance group would be more reasonable.

The findings of this study present the following educational implications. First, KETs need to be more sensitive with high FL vowel errors. Since KETs are also English learners who were not properly educated as to pronunciation back in their school days, they might need more help from

readily usable teaching materials to give PI. The explanation about the articulation of high FL vowels and the concrete guide to teaching them would help teachers feel more comfortable with talking about phonemes that are likely to influence learners' intelligibility in speech.

Second, KETs need to consider whether their overly high WEes acceptance level contributes to the misjudgment. In Korean English classes, teachers might decide that it is redundant to give pronunciational feedback to students unless the errors cause communication problems. However, some deviations are not a justifiable variation of pronunciation, but wrong pronunciation that would inhibit learners' conversation with whom they do not share the first language. Therefore, what is acceptable as Korean-accented English and what is not acceptable as a wrong pronunciation should be discerned by teachers.

This study has a number of potential limitations that should be taken into consideration. First, specifying the backgrounds of the NES group is needed. Some of them may have had teaching experience or familiarity with Korean. Creating separate groups of NESs would yield more concrete traits of KETs. Second, the target words in language stimuli had a different number of syllables and may have had different levels of difficulty. Since language samples were collected from a spoken corpus in which advanced level Korean English speakers read English sentences, the pronunciation errors were genuine but not frequent. It made it hard to find target words of the same length and difficulty. Even though KETs were proficient English users, there is a possibility that their intelligibility was influenced by how long and how difficult the target words were. Third, the extra words surrounding target words might have affected the performance in tasks. Since the duration of the target words was too short, a couple of words were clipped and embedded together. Though participants were asked to focus on target words only, it must have been difficult for them to exclude surrounding words. To address this issue, creating artificial language samples might be needed.

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Appendix 1

〈Survey items related to KETs' willingness to accept WEes in class〉

Please answer how much you agree with the statement (1 = *strongly disagree*, 5 = *strongly agree*)

(1) If I have an opportunity, I want to teach different varieties of English.

(2) Students' errors should be considered as something which arises from sociocultural factors.

(3) The accurate use of students' English is better evaluated by NESs.

(4) Students should be encouraged to have pride in their Korean accent.

(5) The evaluation criteria should be based on the native norm.

(6) NES's pronunciation is a better model for students than Korean pronunciation.

(7) I am willing to use materials that contain WEs.

(8) The most important variety students need to learn is American or British English.

(9) Regardless of the country of origin, anyone can teach English if they are good at it.

국문초록

한국인 영어교사의 분절음 오류에 대한 이해가능성과 이해도: 음소 부담량과 태도를 중심으로

강경미 (한국교원대학교 대학원생)
정현성 (한국교원대학교 교수)

이 연구의 목적은 한국인 영어 학습자가 자주 만들어 내는 분절음의 오류가 한국인 영어교사의 이해 가능성과 이해도에 미치는 영향을 탐구하고 그 과정에서 드러나는 교사 인식의 역할을 알아보는 데 있다. 유의미한 평균 차이가 나타나는 음소를 구체화하기 위해서 분절음의 오류를 음소 부담량과 자·모음으로 구분하였다. 영어 원어민의 이해 가능성과 이해도 점수를 비교 데이터로 수집하였다. 이해 가능성 과제에서 오류 분절음이 모음일 때 음소 부담량이 높은 음소는 한국인 교사에게만 통계적으로 유의미한 부정적인 영향을 미쳤다. 교사와 화자가 같은 모국어를 공유함에도 해당 음소의 오류를 이해하는데 특별한 이점이 없었음을 나타낸다. 그러나 이해도 과제에서는 해당 분절음 오류에 관한 유의미한 점수 차이가 없었다. 이는 한국인 교사가 실제로 높은 음소 부담량의 모음 오류가 포함된 단어를 이해하는 데 어려움을 겪었음에도 불구하고 이를 편하게 이해하였다고 잘못된 판단을 내렸음을 보여준다. 또한, 세계 영어를 교실에 수용하고자하는 교사의 태도와 관련하여 유의미한 평균차이가 발견되었다. 낮은 수용도를 가진 교사들이 높은 음소 부담량을 가진 모음의 오류에 대해 더 낮은 이해도 점수를 부여하였다. 해당 오류에 대한 교사의 낮은 이해가능성 점수를 고려하면, 현 실험 상황에서 낮은 수용도의 교사의 이해도 점수 부여가 좀 더 합당한 것으로 보인다.

주제어: 분절음 오류, 이해 가능성, 이해도, 음소 부담량, 태도