

Effects of Listeners' Communicative Experiences in Thai English on the Intelligibility of Thai English

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Intelligibility of second language (L2) English has become an important goal in English pronunciation teaching. However, intelligibility research primarily focused on L2 English users and L2 production features; only a handful of studies have examined other effects on the intelligibility of L2 English. In line with the three-part model of intelligibility (Munro, 2008), this study focuses on listener factors by examining how listener experience with Thai English affects the actual understanding of Thai English utterances. Study participants were 40 students at a U. S. university. Data were collected through a questionnaire and a 38-item intelligibility test. While controlling for participants' English proficiency, Analysis of Covariance confirmed that participants with experience in Thai English outperformed those with no experience in Thai English, as measured by the Thai English intelligibility task. The findings suggest that listeners' communicative experiences in an L2 English variety improves the intelligibility of that English variety regardless of the listeners' first languages. Implications for research and pronunciation pedagogy are discussed.

Key words: intelligibility, listener factor, Thai English, ELF, WE

1. INTRODUCTION

There has been increasing interest in the intelligibility of second language (L2) English, defined as “the degree of a listener's actual comprehension of an utterance” (Derwing & Munro, 2009, p. 479). Research demonstrates that L2 English accents do not necessarily cripple actual understanding (Munro & Derwing, 1995) and that different segmental and suprasegmental features of L2 English have different effects on intelligibility (Deterding & Kirkpatrick, 2006; Jenkins, 2000). These findings led researchers to conclude that

intelligibility, rather than native-like pronunciation, should be the learning goal in pronunciation pedagogy.

As elucidated by Munro (2008), the intelligibility of L2 English utterances is affected by L2 speaker factors, listener factors as well as contextual factors. To date, however, most studies have focused on L2 speaker factors including the features of L2 production such as accentedness (Derwing & Munro, 1997), segmental features (Jenkins, 2000; Munro, Derwing, & Thomson, 2015) and suprasegmental features (Field, 2005; Hahn, 2004) or the L2 speaker's exposure to English input (e.g., length of residence in the English-speaking speech community) (Derwing & Munro, 2013; Saito, 2015). Although these studies contributed to our understanding of how L2 production features and the L2 speaker's experience influence intelligibility, relatively few studies have examined listener factors and contextual factors on intelligibility of L2 English.

A growing number of studies have begun to identify listener factors such as first languages (e.g., Munro, Derwing, & Morton, 2006); familiarity with topics and L2 English varieties (Gass & Varonis, 1984; Kennedy & Trofomovich, 2008); attitude toward L2 speakers and L2 accented speech (Lindemann, 2002, 2010; Lindemann & Subtrielu, 2013) and listening strategies (Zielinski, 2008).

The present study seeks to contribute to this line of research by analyzing the effects of listener experience with Thai English on the intelligibility of Thai English for listeners with diverse first languages (L1s). According to Kachru's (1992) conceptualization of English, Thai English is part of the expanding-circle English varieties, as with Korean English. In the expanding-circle countries English is learned as a foreign language and plays no institutional role, and thus is considered as the norm-dependent varieties.

Levis (2005) predicted that the expanding-circle English users encounter more pronunciation-related negotiations in interaction than English users from inner-circle or outer-circle countries do. Thus, more knowledge about the influence of listener factors on the intelligibility of the expanding-circle English varieties could be helpful for teaching English pronunciation as an international language (EIL) in the expanding-circle countries. English is linguistically unrelated to Thai, so various kinds of cross-linguistic influences, in particular phonological interferences, are salient in Thai English (Smyth, 2001; Trakulkasemsuk, 2012). The following section briefly reviews literature related to intelligibility and listener factors.

2. LITERATURE REVIEW

Most intelligibility studies have focused on the characteristics of L2 English to identify (a) the segmental and suprasegmental features of L2 English speech that are responsible for

impairing intelligibility (e.g., Munro, Derwing, & Thomson, 2015; Maastricht, Kraemer, & Swerts, 2016) or (b) the effects of L2 English speakers' experience with native English varieties on the features of their L2 English pronunciation (Derwing & Munro, 2013; Derwing, Munro, & Thomson, 2008; Saito, 2015). However, as Munro (2011) rightly pointed out, "successful communication depends on the abilities and efforts of both speaker and listener" (p. 11). Thus, pronunciation teaching practices should be based on a model of intelligibility that takes into consideration not only the properties of L2 English speech (e.g., segmental, suprasegmental, prosodic features, and fluency) but also listener factors (e.g., familiarity with accent, topic, or interpersonal familiarity) and contextual factors (e.g., semantic context).

Several studies have investigated listener factors affecting the intelligibility of L2 English. Some studies reported that listeners' first language marginally affects intelligibility (e.g., Derwing & Munro, 2013; Field, 2005; Munro, Derwing, & Morton, 2006), other researchers have argued for the importance of listener effects on intelligibility. For example, Gass and Varonis (1984) identified that listeners' familiarity with topics and L2 English accents facilitates the intelligibility of L2 English. Field (2004) demonstrated that listeners' world knowledge or information obtained from the preceding conversation influences intelligibility. Zielinski (2008) suggested that poor listening strategies might be responsible for reduced intelligibility of L2 English. More recently, Lindemann and Subtrielu (2013) showed that L1 English listeners' negative attitudes toward the L2 speaker and L2 accented English degrade intelligibility and comprehensibility (i.e., perceived ease of understanding) of L2 English (see also Lindemann, 2002, 2010).

Among a few listener factors investigated, the effects of listener experience with L2 English varieties appear inconsistent. For example, Kennedy and Trofimovich (2008) demonstrated significant effects of listener experience with L2 English varieties on their performance in the intelligibility scores of L2 English spoken by L1 Mandarin English users. In contrast, Munro, Derwing, and Morton (2006) contended, "whatever advantage listeners had in hearing their own accents was so small as to be readily outweighed by other factors" (p. 121). For them, the listeners' L1 was not a significant factor in intelligibility.

Research by Munro, Derwing, and Morton (2006), however, is difficult to interpret because they did not indicate the reliability of the 48-item intelligibility test and the descriptive statistics of the intelligibility scores. More importantly, one possible reason for Munro, Derwing, and Morton's conflicting claims could be attributed to a methodological issue, specifically, the test items that were adapted from their earlier study (Derwing & Munro, 1997). The histogram of the intelligibility scores in this study indicates a ceiling effect in the distribution of the intelligibility scores (Derwing & Munro, 1997, p. 9). Their study also did not provide the descriptive statistics for the intelligibility scores although it seems that more

than half of the participants scored above 80 percent. This ceiling effect thus suggests that the test items were not effective in detecting the effects of listeners' experience on the intelligibility of the four English varieties.

The primary goal of the present study is to investigate the associations between listener experience with Thai English and its intelligibility. The following two research questions guide the study:

- 1) What are the relationships between a variety of English-use experiences and the intelligibility scores?
- 2) To what extent is there an association between participants' experience with Thai English and the scores of Thai English intelligibility?

3. METHODS

3.1. Participants

Through posts at a U. S. university, 40 participants¹ (female = 24, *mean* age = 28.83 [*SD* = 6.45]) were recruited for this study. The notice included two criteria: first, having or not having stayed in Thailand at least two weeks; second, experience communicating with Thai English speakers. The minimum stay criterion was set to exclude participants with superficial experience with Thai English, because a limited amount of exposure to L2 English varieties does not affect listeners' actual understanding of L2 English utterances (Gass & Varonis, 1984; Kennedy & Trofimovich, 2008).

In terms of English proficiency, these participants were relatively coherent population as they were matriculated undergraduate ($n = 12$) and graduate students ($n = 28$) at a U. S. university including 12 L1 English users and 28 L2 English users. This allowed the study to control for confounding effects of English proficiency on the intelligibility of Thai English. Among the 28 L2 English speaking participants, there were four Chinese, one French, two Ilokano, two Japanese, 15 Korean, and five Thai L1 users. All listeners reported normal hearing.

3.2. Data Collection and Materials

Data were collected through a computer-based intelligibility test and a paper-and-pencil questionnaire. The collection procedures took 40 to 60 minutes to complete. To

¹ This study was approved by the University of Hawai'i Committee on Human Studies (CHS #21728). All participants voluntarily agreed to participate and signed informed consent forms.

measure the intelligibility of Thai English, the influential method developed by Derwing and Munro (1997) was adopted. This study, however, differs from Derwing and Munro's methodology, because the test items for this study were selected from naturally occurred L2 English utterances recorded in EFL classrooms in a college in Thailand in order to heed Major's (2008) note that elicited speech production may differ from naturalistic production (see also Rajadurai, 2007 for her criticism at the use of elicited stimuli).

Of 38 items, the first three were for practice. These items were spoken by two L1 Koreans and one L1 Arabic speaker of L2 English and were not included in the final scores. The test included 10 items that were uttered by four L1 English speakers who were born and raised in the U. S. Including these items eliminated a possible training effect from listening only to Thai English. The L1 English items were drawn from recorded classroom discussions during TESOL content classes for graduate students at a US university.

The remaining 25 items were uttered by 14 L1 Thai speakers of L2 English, who had been born and raised in Thailand. All 14 confirmed that they had never resided in English-speaking countries. These Thai English speech stimuli were extracted from recordings of conversation-for-learning activities conducted as part of the curriculum of an 8-week intensive business English course for students majoring in international business management. The activities aimed to provide the students with opportunities to use English in a one-on-one context. Topics of the conversations were not pre-arranged. The mean lengths of American English stimuli and of Thai English stimuli were 8.2 and 5.0 words, respectively.

The students' conversation partners in the recordings were six novice English instructors who offered various English courses at the Thai university as part of the requirements of a master's degree in TESOL at a U. S. university. The instructors had never taught English in Thailand prior to the recording. The instructors' L1s included Japanese, Arabic, Korean, and English.

This study pays attention to the difficulty of test items as an important factor for the measurement of intelligibility. Accordingly, utterances of Thai English were chosen because they were determined to be difficult to understand based on the conversation partners' responses in their conversations. During the conversational activities, the Thai students' conversational partners sometimes displayed intelligibility-related trouble with some Thai English utterances. By choosing these Thai English utterances as stimuli for the intelligibility task, it was hoped that a ceiling effect in the measurement could be avoided so that the influence of listener experience with Thai English on its intelligibility could be clearly assessed.

Brown (2005) introduced the notion of item discrimination (ID) as an indicator of how well a test item distinguishes good performers from poor performers among test takers.

The discriminating power was explored by computing IDs of the test items (see the item discrimination analysis results in Appendix A). Five items (items 9, 19, 28, 30, and 31) turned out to be ineffective as they obtained ID below .3. Of the five items, two were of American English (*So today I did a longer review than I thought I would* [Item 9] and *So it was a really good learning experience* [item 31]), which appeared to be too easy, as indicated by the upper and the lower item facility (i.e., the percentage of the participants who answered a particular item correctly). These items, however, were not excluded from the analysis, because the American English stimuli were not designed to be difficult. The three Thai English stimuli appeared to be too difficult based on the item facility although the utterances were syntactically simple (*I wanna choose like a vowel* [items 19]; *how old are you?* [item 28]; *export, document* [item 30]). These items appeared to function as intended and thus were selected to identify high performers among the participants. The test items were found highly reliable for the 35 items ($\alpha = .84$). Cronbach's alphas for the American English and the Thai English items were .76 ($k = 10$) and .86 ($k = 25$), respectively.

Before taking the test, students received contextual information for the stimuli (e.g., free-conversation activities between Thai college students and English instructors). The participants individually listened to recorded Thai English utterances in a quiet room and were asked to write down what they had heard using standard English. Each item was played once, and the test was self-paced. The test part of data collection took approximately 20 to 30 minutes to complete (see the transcribed test items in Appendix B).

After completing the transcription task, participants were asked to complete a questionnaire (see Appendix C) designed to gather information on their demographic characteristics (e.g., age, gender) and language history, such as length of residence (LoR) in Thailand and in English-speaking countries (ESC), first language; educational language, and the amount of English used in (non)English-speaking contexts. Participants using English as a second language were also asked whether they had been required to attend any supplementary English courses to improve their speaking and listening skills after they had matriculated.

3.3. Analytic Methods

The distributions of the two sets of the intelligibility scores were examined in order to demonstrate the effects of the test item difficulty. To answer *Research Question 1*, the relationships between 12 variables and the intelligibility scores were explored using the Pearson product-moment correlation. Also, Principle Component Analysis (PCA) was

performed to examine the relationship between the variables in relation to the intelligibility scores. The relatively small sample size in this study does not permit a robust PCA; however, this method was still used because its role in this study was to make sense of the data for a descriptive purpose. *Research Question 2* was addressed using One-way Analysis of Covariance (ANCOVA) in order to reveal the extent of how listener experience in Thai English is associated with the scores of Thai English intelligibility.

4. RESULTS

The first part of the results presents the distribution of the two sets of intelligibility scores. As can be seen in Table 1, the distributions of the scores of American English intelligibility and Thai English intelligibility are close to normal distribution. The mean and median scores indicate that the participants understood the American English variety better. The normal distribution of the scores of Thai English intelligibility confirms that the item difficulty of the intelligibility task is an important factor on the measurement of the intelligibility of L2 English (cf. Munro, Derwing, & Morton, 2006).

TABLE 1
Descriptive Statistics for the Intelligibility Task Results ($n = 40$)

Statistics	American English Intelligibility Scores	Thai English Intelligibility Scores
<i>M</i>	76.88% (64.58)	57.36% (72.85)
<i>Mdn</i>	78.57% (66)	57.09% (72.5)
<i>SD</i>	11.45% (9.62)	12.48% (15.59)
Skewness	-.57	.42
Std. Error of Skewness	.37	.37

Addressing *Research Question 1*, the results below report on the relationships between variables in relation to the American English and Thai English intelligibility scores. Pearson product-moment correlations between the variables are given in Table 2. Variables that correlate with the Thai English intelligibility scores are related to the listeners' English-use experience including length of residence (LoR) in English speaking countries and in Thailand, the amount of English use in English speaking countries (ESC), and the listeners' perceived familiarity with Thai English.

TABLE 2
Pearson Product-moment Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
ThaiE INT scores (1)	1													
AmE INT scores (2)	.27	1												
Age (3)	.20	-.12	1											
LoR in ESC (4)	.39*	.78*	.12	1										
English use in ESC (5)	.45*	.48*	.08	.70*	1									
English use with Thai in ESC (6)	.12	-.34*	-.20	-.23	-.07	1								
LoR in Thailand (7)	.51*	-.10	-.18	-.21	.07	.49*	1							
English use in Thailand (8)	.30	.24	.12	.28	.22	.01	.19	1						
ThaiE familiarity (9)	.74*	.05	.09	.16	.30	.14	.47*	.46*	1					
Education language (10)	-.01	.22	-.26	.04	.11	-.18	-.03	.11	.06	1				
Home language (11)	.00	.24	-.23	.17	.20	-.20	-.14	-.09	-.16	.61*	1			
L1 English (12)	-.23	-.70*	-.02	-.79*	-.42*	.20	.19	-.18	.01	.17	-.01	1		
ESL course (13)	-.09	.38*	-.08	.13	.06	-.31	-.18	.15	-.11	.25	.18	-.05	1	
Educational level (14)	.19	-.12	.51*	-.15	-.21	-.09	.01	.07	.29	.08	-.21	.22	.04	1

Note. *Correlation is significant at the 0.05 level (2-tailed). ThaiE = Thai English; INT scores = intelligibility scores; LoR = length of residence; ESC = English-speaking countries.

To further explore the dimensions of the variables relative to the two sets of the intelligibility scores, Principal Component Analysis (PCA) with varimax rotation was performed on 14 variables. This procedure also served to reduce variables for Analysis of Covariance to answer *Research Question 2*.

Multivariate normality was checked and found to be assumed through Mahalanobis D^2 . One univariate outlier was found in the American English intelligibility scores. The outlier was adjusted to ensure more robust results by raising the score from 38 (45.34%, Z score = 2.9) to 42 (50%, Z score = 2.4). Five components showed Eigenvalues over 1.00. The scree plot also confirmed that a five-component solution was appropriate.

TABLE 3
Principal Component Analysis

Variables	Component					h^2
	1	2	3	4	5	
LoR in ESC	.952*	.052	.051	.061	.083	.922
L1 (English and non-English)	.868*	-.095	-.215	-.084	.082	.822
American English intelligibility	.786*	-.001	.182	-.084	.400	.817
English use in ESC	.741*	.292	.206	.000	-.120	.691
Thai English familiarity	.104	.853*	.007	.238	.072	.800
LoR in Thailand	-.197	.796*	-.063	-.273	-.089	.759
Thai English intelligibility scores	.386	.782*	.061	.232	-.106	.830
English use with Thai English in ESC	-.281	.453*	-.257	-.420	-.314	.625
Educational language	-.063	.076	.868*	-.023	.255	.829
Home language	.165	-.135	.863*	-.152	-.064	.818
Age	.098	-.016	-.230	.850*	-.134	.802
Education level	-.271	.197	.005	.791*	.145	.758
ESL course	.075	-.173	.193	-.006	.799*	.711
English use in Thailand	.206	.491*	-.126	.074	.556*	.615
Proportion of variance	23.329	18.624	12.881	12.539	9.761	77.134

Note. ESC = English-speaking countries; * highest loading for each variable; [bold] loadings above .3.

The results of the PCA analysis demonstrate that separate dimensions are formed in relation to the two sets of intelligibility scores (i.e., American English and Thai English scores). The loadings for each variable on the five factors are presented in Table 3. The bold-faced type and asterisks indicate loadings above .30 and the highest loading for each variable in the table, respectively. Communalities (h^2) indicate the total proportion of variance accounted for by the five components in each variable. The five components account for 77.13 percent of the variance of the data. The bottom row of the table shows the overall proportion of variance accounted for by each component. The results of PCA provide descriptive evidence that the Thai English intelligibility scores are highly related to listener experience with Thai English while the American English intelligibility scores are highly relevant to listener experience with English-use experience in the L1 English community or having English as L1.

Thai English intelligibility is loaded on Components 1 and 2. Variables relevant to experience with Thai English—e.g., English use with Thai users of L2 English in English speaking countries (ESC), length of residence (LoR) in Thailand, English use in Thailand, and familiarity with Thai English—are loaded most heavily on Component 2. In contrast,

American English-related variables—e.g., LoR in ESC, English use in ESC, and having English as L1—are loaded on Component 1.

The loading of the Thai intelligibility scores on Component 1 appears to suggest that factors that relate to the scores of the American English intelligibility are relatively related to the Thai English intelligibility scores; however, the low level of loading indicates that the Thai English intelligibility scores are a poor measure of Component 1. In sum, the correlations and the PCA results suggest that length of residence (LoR) in Thailand is strongly associated with level of the performance of Thai English intelligibility.

Finally, *Research Question 2* is answered by applying the results of the ANCOVA analysis. In order to observe more pure associations between the listener experience with Thai English and its intelligibility, the participants' English proficiency is controlled for by using variables that relate to American English intelligibility such as LoR in ESC and experience of taking supplementary ESL courses. Multiple regression analysis initially may appear more appropriate since the continuous variable, LoR in Thailand, may serve as a predictor of the Thai English intelligibility scores. For example, Saito (2015) demonstrated that Japanese English users' LoR in Canada was a strong predictor of the listeners' ratings of accentedness and comprehensibility of the Japanese English speakers.

TABLE 4
Descriptive Statistics for the Survey Results

Statistic	LoR in ESC	English Use in ESC	English Use with Thai English in ESC	LoR in Thailand	English Use in Thailand
<i>M</i>	154.35	48.45	.70	20.56	15.13
<i>Mdn</i>	103.50	40.00	.00	.00	.00
<i>SD</i>	126.77	32.37	1.96	68.01	30.65
Skewness	.73	1.08	3.46	3.51	1.99
Std. Error of Skewness	.37	.37	.37	.37	.37
Kurtosis	-.53	1.10	12.11	11.47	2.83
Std. Error of Kurtosis	.73	.73	.73	.73	.73
Range	477.00	144.00	9.00	312.00	112.00

Note. Unit is month.

However, descriptive statistics presented in Table 4 indicates that LoR in Thailand was significantly skewed. This was actually expected, because there were 14 participants who never experienced Thai English. Thus, this data was judged inappropriate for use in multiple regression analysis.

To this end, the data were converted into categorical data for ANCOVA. The participants were divided into two groups: (1) those who had stayed in Thailand; and (2) those who had not

stayed in Thailand. The categorical data entered into the general linear model is detailed in Table 5. The experience of staying in Thailand is used as a proxy indicator of the listeners' experience with Thai English. To control for the effects of English proficiency, two variables were entered into the model. The variables include L2 English users' experience of taking supplementary English courses due to their low proficiency and their LoR in ESC.

TABLE 5
Descriptive Statistics for Categorical Data for the Linear Model

Stay in Thailand		ESL Courses Taken	
Category	Frequency	Category	Frequency
Yes	26 (65%)	Yes	4 (10%)
No	14 (35%)	No	36 (90%)

It is assumed that having Thai as L1 does not necessarily contribute to the intelligibility of Thai English in light of the findings that listeners' L1s play a marginal role in intelligibility (Bradlow & Bent, 2003; Gass & Varonis, 1984; Munro, Derwing, & Morton, 2006). However, it can be reasonably expected that Thai L1 users of L2 English have been exposed to Thai English more than any other listeners with other L1 backgrounds. Descriptive statistics of the Thai English intelligibility scores grouped by "Experience of Stay in Thailand" is shown in Table 6.

TABLE 6
Thai English Intelligibility Scores Grouped by Experience of Stay in Thailand

Experience of Stay in Thailand (minimum 2 weeks)	<i>n</i>	Thai English Intelligibility Scores	
		<i>Mean</i>	<i>SD</i>
No	26	51.55	9.46
Yes	14	65.61	11.30

ANCOVA was performed to test if the group with experience in Thai English outperformed the group without this experience. Tabachnick and Fidel (2012) have noted that a formal test of homogeneity of variance is not needed when the ratio of sample sizes is less than 4:1 (p. 232). The current study meets this criterion (26/14 = 1.86:1). Homogeneity of regression was examined by testing interactions between the CVs and the IVs using a customized model. As Tabachnick and Fidell (2012) have suggested, the alpha criterion was adjusted for because the multitude of tests generated by this method of evaluating homogeneity of regression (p. 239).

The test confirmed that the interactions between experience of stay in Thailand and LoR in ESC ($p = .735$), and between experience of stay in Thailand, LoR in ESC, and ESL

course ($p = .774$), and between LoR in ESC and ESL course ($p = .489$) were not significant; therefore, the assumption of homogeneity of regression was tenable. Finally, a scatterplot confirmed a linear relationship between Thai English intelligibility scores and LoR in ESC.

TABLE 7
Analysis of Covariance of Experience of Stay in Thailand on Thai Intelligibility Scores

Source of Variance	Type II Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>	Partial <i>Eta</i> Sq	Power
Experience of Stay in Thailand Covariates	1266.21	1	1266.21	13.19	.001	.27	.94
LoR in ESC	344.45	1	344.45	3.59	.066	.09	.45
ESL course	140.63	1	140.63	1.47	.234	.04	.22
Error	3456.78	36	96.02				

Note. *R* Squared = .393 (Adjusted *R* Squared = .343).

The results of ANCOVA are presented in Table 7 above. This analysis reported TYPE II Sum of Squares, as is appropriate for the non-experimental research design with unequal cell sizes (Tabachnick & Fidell, 2012, p. 219). There was a significant effect of Experience of Stay in Thailand on the scores of Thai English intelligibility after controlling for the effects of LoR in ESCs and L2 English users' experience of taking ESL courses as a proxy of their English proficiency, $F(1, 36) = 13.19, p = .001$.

The effect size indicated by partial eta sq was .27, which means that 27 percent of the variance of Thai English intelligibility scores is accounted for by having experience of staying in Thailand. Covariates did not reach statistical significance. Planned contrast revealed that having experience of staying in Thailand, $p = .001$, 95% *CI* [5.47, 19.29] significantly increased the Thai English intelligibility scores compared to having not stayed in Thailand.

5. DISCUSSION AND CONCLUSIONS

The purpose of this study was twofold: to improve the methodology of measuring intelligibility; and to examine the effects of listener experience with Thai English on the actual understanding of Thai English utterances. This study produced two major results. First, it showed that the distribution of the Thai English intelligibility scores was close to normal distribution, which contrasts with the ceiling effect observed in Derwing and Munro (1997). While adopting Derwing and Munro's method, the test items in this study carefully adopted naturalistically recorded data, which included utterances misunderstood by Thai English users' conversational partners of various L1 backgrounds. The reason for choosing naturally spoken Thai English

utterances was that problems of intelligibility in naturalistic interactions are indeed not prevalent in L2 English-mediated conversations, as previously demonstrated (e.g., Deterding & Kirkpatrick, 2006; Jenkins, 2000). As such, it is important to control for item difficulty by choosing L2 English utterances that were treated as problematic in terms of intelligibility to allow for more accurate evaluation of the effects of listener factors on the intelligibility of L2 English.

The second major result was that the listener experience with Thai English, that is, one aspect of listener factors, accounts for 27 percent of the variance in the scores of Thai English intelligibility. This finding supports the argument that listener experience with L2 English varieties facilitate actual understanding of L2 English (Kennedy & Trofimovich, 2008).

In order to perceive phonetic segments, listeners must draw on the spectral (e.g., voicing) and temporal dimensions of phonological segments (e.g., voice onset time) that are associated with phonetic contrasts. With their exposure to Thai English, the experienced listeners can be seen to accumulate acoustic information that helped them perceive relevant English phonological categories. Flege (2009) has argued that input can lead to creation of new categories and, as a result, to accurately perceive phonological segments. In this view, Flege's (1995) speech learning model explains the findings in this study that listener experience with Thai English results in better Thai English intelligibility.

The role of listeners in intelligibility has been relatively underemphasized the pronunciation teaching. For example, the recent survey on how research is represented in pronunciation teaching materials does not include the pedagogical applications based on listener factors in intelligibility while highlighting L2 production-related research results and their pedagogical implications (Levis, 2016). The speaker-centered approach to investigating and improving intelligibility problematizes, and thus may delegitimize, English varieties other than those from the inner circle (Kachru, 1992), as reflected in pedagogical suggestions, such as reducing L2 English users' non-standard (supra)segmental features or maintaining some features of standard English (e.g., Reed & Levis, 2015). Rajadurai (2007) has argued against the underlying assumption of the speaker-centered approach that "the native variety should constitute the norm" (p. 93), because English is no longer monopolized by the inner-circle English speakers (Crystal, 2008; Levis, 2005). Rajagopalan (2010) noted that the adjective, *intelligible*, is evaluative and not descriptive in nature (p. 468), pointing out the status of intelligibility relative to listeners in communication. The current study adds evidence about the effects of listener experience with Thai English on the intelligibility of Thai English.

One pedagogical implication for improving the intelligibility of English as an international language (EIL) is that English teachers and material developers should include not only inner-circle English varieties but also outer-circle and expanding-circle English varieties as listening materials. While it is shown that adult English learners maintain an L2 English accent (Flege & Frieda, 1995), most intelligibility studies put a heavy emphasis on L2 English users' L2 production for better intelligibility (e.g., Low, 2015; Reed & Levis, 2015). When recognizing the role of both

the speaker and the listener in the intelligibility English, it equally becomes important and practical to take into consideration the listener-centered perspective of the intelligibility of English in teaching English as EIL in this globalized era.

In light of the socio-economical contexts that South Korea's top ten largest trade partners include Asian expanding-circle countries such as China, Japan, Hong Kong, Vietnam, and Taiwan, the important contexts of English use for Korean users of L2 English include between speakers from the outer circle and expanding circle (Levis, 2005). Given the sociolinguistic realities for Korean users of L2 English, teaching English for business purposes at a university level in Korea needs to include English varieties from these two circles to prepare Korean L2 English users to be successful listeners of English (cf. Kirkpatrick, 2012).

This study is not without limitations. First, the number of the participants with the experience of staying in Thailand may be considered too small. However, by using ANCOVA this study obtained relatively high statistical power of 94 percent and thus adequately assessed the effect size of the listeners' experience. Second, this study did not conduct a regression analysis to more precisely assess the effects of LoR on intelligibility, because the LoR in Thailand violated the assumption of homogeneity. Future studies could more precisely investigate how listener experience with L2 English can improve intelligibility of L2 English by focusing on the effects of length of residency in a given language context.

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APPENDIX A
Item Facility and Item Differentiation Index

Item	IF	IF _{upper}	IF _{lower}	ID
Q1	.68	.97	.35	.62
Q2	.55	.83	.26	.58
*Q3	.88	1.00	.64	.36
Q4	.85	1.00	.56	.44
Q5	.34	.83	.00	.83
*Q6	.84	1.00	.62	.38
Q7	.58	.85	.27	.57
Q8	.68	.99	.23	.76
*Q9	.93	1.00	.79	.21
Q10	.10	.31	.00	.31
Q11	.20	.50	.00	.50
Q12	.45	.71	.22	.49
Q13	.76	1.00	.42	.58
*Q14	.82	1.00	.60	.40
Q15	.47	.82	.05	.77
Q16	.47	.77	.03	.74
*Q17	.83	1.00	.46	.54
Q18	.54	.90	.15	.74
Q19	.48	.59	.37	.22
Q20	.83	1.00	.61	.39
Q21	.64	.82	.51	.31
*Q22	.88	1.02	.69	.33
Q23	.61	.79	.44	.35
*Q24	.46	.64	.31	.33
Q25	.42	.76	.15	.60
*Q26	.64	.86	.41	.45
Q27	.65	.94	.41	.54
Q28	.56	.73	.44	.29
Q29	.90	1.00	.69	.31
Q30	.55	.66	.50	.16
*Q31	.88	1.00	.71	0.29
Q32	.12	.36	.00	0.36
*Q33	.61	.91	.36	0.55
Q34	.34	.73	.00	0.73
Q35	.59	.78	.35	0.43

Note. The asterisked items are American English items; the rest of the items are Thai English. Bold face indicates ID lower than .30.

APPENDIX B
Intelligibility Test Items

Set A	Set B	Stimuli
Training 1		And I am teaching the level two class.
Training 2		So I will distribute the material.
Training 3		And I made up my own questions and activities on that.
1	21	Why you come to teach?
2	22	When I place under pressure situation,
*3	*23	What did you have for lunch?
4	24	We can help to company to contact with them.
5	25	To achieve, to accomplish.
*6	*26	This is what I envision.
7	27	Thai airway is the international airline business.
8	28	Surf internet, listen music, play game.
*9	*29	So today I did a longer review than I thought I would.
10	30	By bus.
11	31	One brother.
12	32	Maybe my own business or air hostess.
13	33	It is the star alliance.
14	*34	It is a component of this lesson.
15	35	I'm kidding.
16	1	I'm Christian.
*17	*2	If they end up not listening.
18	3	It's world-wide.
19	4	I wanna choose like a vowel.
20	5	I know how to spend to be adult like.
21	6	I prefer to use truck.
*22	*7	I like to keep that framework kind of the same.
23	8	I learn about English but first year learn Thai.
*24	*9	I know someone said me make name cards.
25	10	I wanna know meaning, the meaning of child with disability.
*26	*11	I had a kind of half-busted lesson today so.
27	12	I get some pressure.
28	13	How old are you?
29	14	Gift shop
30	15	Export, document.
*31	*16	So it was a really good learning experience.
32	17	Buy foreign currency.
*33	*18	And that's just to get them to start thinking in English.
34	19	And second is friendly.
35	20	All of subject will study by English

Note. The asterisked items are American English.

APPENDIX C
Language History Questionnaire

Thank you for your participation. This survey asks about your experience of English and other languages and how you understand English spoken with an accent. Please answer the following questions to the best of your knowledge.

Age: _____ Gender: Male Female

Part A. Language experience.

1. What is your first (native) language? (Check more than one, if applicable.)

<input type="checkbox"/> English	<input type="checkbox"/> Japanese	<input type="checkbox"/> Chinese	<input type="checkbox"/> Lao	<input type="checkbox"/> Korean	<input type="checkbox"/> Thai	<input type="checkbox"/> Other(s):
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2. What was the primary language(s) **you spoke to and heard from your family members at home** from age 0-15?

Family member	Language(s)
Father:	_____
Mother:	_____
Other caregiver(s):	_____
Siblings:	_____

3. Please fill in blanks of the **language(s) of instruction in school**: (Please exclude foreign language classes.) *If you have more than two languages, please specify them with years.

Education level	Language(s) (years)	Education level	Language(s) (years)
Pre-school	_____ () yrs	High school	_____ () yrs
Kindergarten	_____ () yrs	College (BA)	_____ () yrs
Primary/Elementary school	_____ () yrs	Graduate School (MA)	_____ () yrs
Secondary/Middle school	_____ () yrs	Graduate School (PhD)	_____ () yrs

4. Please **list all language(s) you learned other than your first (native) language** (1st column) and provide **years of learning for** each of your additional languages (2nd column). **How competent** are you in those languages in terms of two areas on a scale of one to six as below. (Circle one that applies per each area of competence.)

Language	Years of Learning	Speaking Competence						Listening Competence					
		1=poor, 2=elementary, 3=moderate 4=good, 5=very good, 6=excellent						1=poor, 2=elementary, 3=moderate 4=good, 5=very good, 6=excellent					
1.	___yrs ___mon	1	2	3	4	5	6	1	2	3	4	5	6
2.	___yrs ___mon	1	2	3	4	5	6	1	2	3	4	5	6
3.	___yrs ___mon	1	2	3	4	5	6	1	2	3	4	5	6
4.	___yrs ___mon	1	2	3	4	5	6	1	2	3	4	5	6
5.	___yrs ___mon	1	2	3	4	5	6	1	2	3	4	5	6

5. If you are a UH student, **check all ELI courses** that you were **required to take**.

ELI 70

Listening Comprehension 1

- currently taking
 have taken before

ELI 72

Reading for foreign students

- currently taking
 have taken before

ELI 80

Listening Comprehension 2

- currently taking
 have taken before

ELI 82

Advanced ESL Reading

- currently taking
 have taken before

Not relevant

6. What degree are you **currently pursuing**? What is your major?

a) Bachelor Degree b) Master Degree c) Doctoral Degree

Major(s): _____

Part B. Experience using English in English-speaking countries

7. In total, how long have you stayed in **English speaking countries**? ___years ___months

8. During your stay in **English-speaking countries**, how much English or non-English languages did you use to communicate with people per week?

Language	Average language use	Languages	Average language use
		<input type="checkbox"/> Non-English language 1	_____hours/wk
<input type="checkbox"/> English	_____hours/wk	: _____	
		<input type="checkbox"/> Non-English language 2	_____hours/wk
		: _____	

9. Please check the English accent(s) that you heard in communication during your stay in **English-speaking countries** and write an estimate of the average number of hours per week you heard the accents.

Perceived Accent	Average hearing (hours/week)	Perceived Accent	Average hearing (hours/week)
<input type="checkbox"/> British English		<input type="checkbox"/> English with a Thai accent	
<input type="checkbox"/> American English		<input type="checkbox"/> English with a Ilocano accent	
<input type="checkbox"/> English with a Japanese accent		<input type="checkbox"/> English with a Tagalog accent	
<input type="checkbox"/> English with a Chinese accent		<input type="checkbox"/> English with a Spanish accent	
<input type="checkbox"/> English with a Lao accent		<input type="checkbox"/> English with a Korean accent	
<input type="checkbox"/> Others		<input type="checkbox"/> Other	

Part C. Experience using English in non-English-speaking countries.

10. Please list all of **the non-English-speaking countries** you stayed in for more than 2 weeks with **the length of your stay** in each country. Also, how long did you communicate with the non-native speakers of English in those countries?

Non-English speaking-country	Length of stay (years/months/weeks)	Hours of Communication in English
<input type="checkbox"/> Thailand		_____ hours/week
<input type="checkbox"/> Laos		_____ hours/week
1.		_____ hours/week
2.		_____ hours/week
3.		_____ hours/week
4.		_____ hours/week
5.		_____ hours/week

Part D. Experience with a variety of English accents.

11. **Which English accents** are familiar to you? (Circle only one degree of familiarity for each accent.)

English Accent	Degree of familiarity					
	1 Not at all familiar	2 Slightly familiar	3 Somewhat familiar	4 Fairly familiar	5 Very familiar	6 very strongly familiar
<input type="checkbox"/> American English	1	2	3	4	5	6

<input type="checkbox"/> British English	1	2	3	4	5	6
<input type="checkbox"/> English with a Japanese accent	1	2	3	4	5	6
<input type="checkbox"/> English with a Chinese accent	1	2	3	4	5	6
<input type="checkbox"/> English with a Lao accent	1	2	3	4	5	6
<input type="checkbox"/> English with a Korean accent	1	2	3	4	5	6
<input type="checkbox"/> English with a Thai accent	1	2	3	4	5	6
<input type="checkbox"/> English with a Ilocano accent	1	2	3	4	5	6
<input type="checkbox"/> English with a Tagalog accent	1	2	3	4	5	6
<input type="checkbox"/> English with a Spanish accent	1	2	3	4	5	6
<input type="checkbox"/> English with a Vietnamese accent	1	2	3	4	5	6

12. In general, among the English accents you know what **English accents** are **easiest for you to understand**? (e.g., English with a Korean accent; English with a British accent.)
13. In general, among the English accents you know what **English accents** are **the hardest for you to understand**? (e.g., English with a Korean accent; English with a British accent.)

Applicable levels: Tertiary

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