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Accentedness, Comprehensibility, Intelligibility, and Interpretability of NNESTs

Forty ESL students responded to extemporaneous stimuli produced by 4 ESL teachers of different language backgrounds. The listeners rated each stimulus for foreign accentedness and comprehensibility (estimation of difficulty in understanding an utterance) on 9-point scales. They also answered comprehension questions to measure speakers' interpretability and transcribed each stimulus in standard orthography to assess speakers' intelligibility. The results showed that accentedness, perceived comprehensibility, intelligibility, and interpretability of NNESTs were all independent dimensions, except for an influence of accentedness on perceived comprehensibility (r = 0.503, *p* < 0.001, 2-tailed). Foreign-accented speech was only believed to be difficult to understand. Thus, the hypothesis that ESL students' negative attitudes are the result of reduced intelligibility and interpretability of NNESTs' foreign-accented speech was not supported in this study. Interestingly, students' high word-recognition rate did not entail better understanding of the utterance.

Introduction

It is only recently that nonnative English-speaking teachers[1] (NNESTs) have been the focus of interest and, as noted by Kamhi-Stein (2004), "more vocal and visible" (p. 6) in the English language teaching (ELT) profession. As a result, the last few years have seen a considerable amount of research focusing on issues related to NNESTs (see Kamhi-Stein, 2005, for an overview of current studies on NNESTs). Reviewing the literature on NNESTs, Kamhi-Stein (2005) declares that the research in this area has gone through three phases, each reflecting a different area of interest: The first phase focused on the self-perceptions of NNESTs; the second on the role of race and language status in relation to issues of credibility; and the third on the NNEST label and others' perceptions of NNESTs. It has been reported that although language learners are subject to be "most affected by the NES/NNES dichotomy" (Braine, 2004, p. 19), research on issues related to second language (L2) learners' perceptions toward NNESTs, especially NNESTs' accentedness, is still at an infant stage (Kamhi-Stein, 2005). Little attention has been paid to NNESTs' foreign accent; only a few studies have focused on

the topic to date (e.g., Kelch & Santana-Williamson, 2002; Liang, 2002; Mahboob, 2004; Scales, Wennerstrom, Richard, & Wu, 2006). Moreover, these studies have focused only on how NESTs' and NNESTs' accentedness affects L2 learners' perceptions in reference to a variety of variables related to the teachers in question. It is noteworthy that the previous studies adopted subjective jugdments, such as a scale of preference and attitude survey questionnaire, in order to assess listeners' perceptions. Such methodological practices, I would argue, can assess only subjective attitudes and/or prejudices toward foreign-accented speech. Research on listeners' preconceived ideas and attitudes about NNESTs' foreign accent rightfully has its own place in the realm of NNEST study, yet data of listeners' perceptions of foreign-accented speech per se are insufficient and inadequate to explain the effect of foreign accent on speech intelligibility. Researchers have affirmed that intelligibility is a vital component in effective communication. So far, however, there has been no discussion about the intelligibility of NNESTs' speech from the perspectives of L2 learners.

Intelligibility Research

For several decades, intelligibility has been recognized as the crucial aspect of L2 speech (Abercrombie, 1949; Crawford, 1987; Nelson, 1982). Abercrombie (1949) asserted that most "language learners need no more than a comfortably intelligible pronunciation" (p. 120). It seems, however, that terminological confusion exists in the use of the term "intelligibility." In earlier works, the notion of intelligibility was that a particular form of English, that is, English used within the "Inner Circle" (Kachru, 1985), was prestigious, correct, intelligible, and the sole norm that must be emulated by nonnative speakers. The other forms, such as English as a second or foreign language, were then, by definition, substandard, incorrect, unintelligible, and needed remediation. This notion of intelligibility was criticized by many researchers (e.g., Smith, 1992; Smith & Nelson, 1985). Smith (1992) argues that "native speakers are not the sole judges of what is intelligible nor are they always more intelligible than nonnative speakers" (p. v). Smith and Nelson (1985) suggest that the general term "intelligibility" should be categorized into a three-level system of intelligibility, comprehensibility, and interpretability. According to the researchers, the term "intelligibility" refers to recognition of words and other sentence-level elements of utterances; "comprehensibility" refers to the recognition of the meaning attached to a word or utterance (i.e., propositional content or Austin's [1962] locutionary force); "interpretability" refers to the recognition of the intent or purpose of a word or utterance (i.e., Austin's [1962] illocutionary force). Bamgbose (1998) describes intelligibility as "a complex of factors comprising recognizing an expression, knowing its meaning, and knowing what that meaning signifies in the sociocultural context" (p. 11); here the researcher uses "intelligibility" as an umbrella term to cover the three-level system of Smith and Nelson (1985). In addition, Munro and Derwing (1995) have emphasized the importance of distinguishing different dimensions of L2 speech—accentedness, comprehensibility, and intelligibility: "accentedness" defined as "the degree to which the pronunciation of an

utterance sounds different from an expected production pattern," "comprehensibility" as "listeners' estimation of difficulty in understanding an utterance," and "intelligibility" as "the extent to which a speaker's utterance is actually understood" (Munro, Derwing, & Morton, 2006, p. 112). As illustrated above, no general consensus in the use of the term "intelligibility" exists.

While the existence of the terminological confusion of the term "intelligibility" might be a reflection of the multidimensional nature of L2 speech and its complexity, it inevitably invites methodological limitations. To enhance construct validity in intelligibility studies, it is only reasonable for researchers to employ the most appropriate assessment technique that corresponds with the term "intelligibility" defined in the study. A wide array of techniques for assessing intelligibility (e.g., cloze test, multiple-choice question, comprehension question, picture selection, true/false question, summarization, and transcription) have been in use. Each assessment technique has its advantages and limitations. The validity and reliability of the common measure of intelligibility, dictation, in which listeners listen to a recording and write the words in standard orthography, for example, have been challenged. Zielinski (2004) reports that word transcription per se might be useful for assessing word recognition, yet might not correlate perfectly with how well the listeners have actually comprehended the full message intended by the speaker. Because of the multidimensional nature of speech intelligibility and its complexity, it seems inadvisable to rely on one single measure to fully evaluate speech samples.

Various elicitation techniques have been employed to record stimuli, for example, read speech and extemporaneous narrations, both of which tend to differ in contextualization, length, and rate of speech. While various data-collection measures were adopted by researchers, it appears that most intelligibility studies have neglected the effect of context on speech interaction. Intelligibility presupposes participants. Smith (1992) aptly declares that "understanding is not speaker- or listener-centered but is interactional between speaker and listener" (p. 76). It is a fact that people adjust their speech in accord with the situation and with whom they are speaking. For example, language teachers, including NNESTs, alter their speech (e.g., change of speech rate, use of appropriate vocabulary, and the like) in accordance with the context and their students' proficiency level. In intelligibility research in general and NNESTs' intelligibility in particular, no consideration was given to the effect of context on speech interaction. Thus, the construct validity may be questionable. It is the purpose of this study to enhance the construct validity by employing an elicitation measure that captures the context of speech interaction.

NNESTs' Foreign Accent

As early as the 1930s, language-attitude research has explored the effects of accented speech on social interactions and judgments. Evidence shows a distinct degree of intolerance for foreign accents in different situations (Callan, Gallois, & Forbes, 1983; Ryan & Carranza, 1975). It has been shown that the context in which communication occurs can significantly influence listeners' perceptions about foreign accents. Ryan and Carranza (1975) found that the listeners in their study were less tolerant of accented speech in a

formal context such as school than in an informal one. Callan, Gallois, and Forbes (1983) also found that accented speech, Greek-accented speech in this case, was most positively rated when the speaker was in an informal context, for example, at a bus stop; in contrast, the listeners viewed accented speech more negatively in a formal context. The findings suggest that the same foreign accent can be perceived or evaluated differently in different contexts.

Research literature has made it clear that the effect the presence of a foreign accent has on social interactions is not all weighted on the accented speaker (Flege, 1988; Gass & Varonis, 1984; Kelch & Santana-Williamson, 2002). While stimulus properties, that is, properties of speech itself, are important to consider, a large number of factors affecting listener judgments and perceptions of accented speakers are listener based, not speaker based. Kelch and Santana-Williamson (2002) provide evidence to support the notion that the characteristics of listeners influence the ratings of foreign accents. In their study, the stimuli were produced by 6 ESL teachers: 1 native speaker of Standard American English (SAE), 1 native speaker of a Southern U.S. variety of English, and 1 native speaker of British English, and 3 nonnative speakers of English with different L1 backgrounds—Portuguese, Japanese, and German. The results of the study showed that the group of native English listeners ($N = 13$) was able to identify the 3 native speakers of English with 97% accuracy. However, 56 ESL students who were in intermediate and high-intermediate levels were not able to accurately differentiate a native English speaker's accent from a nonnative English speaker's accent. The researchers suggest that variation of perceived foreign accent could be the result of distinct listeners' L1. They also suggested that "student familiarity with an accent may be a primary factor in its perception as native or nonnative" (Kelch & Santana-Williamson, 2002, p. 57).

Despite the fact that little is known about the effect of NNESTs' accentedness on speech intelligibility, there has been intolerance for NNESTs' foreign accents in the ELT profession. ESL/EFL teachers who are labeled as NNESTs because of their foreign accent are faced with "linguistic discrimination" (Lippi-Green, 1997) by English-language program administrators and L2 learners. It has been shown that student perceptions of teacher status, that is, NESTs or NNESTs, are based on their perceived accentedness (Kelch & Santana-Williamson, 2002). Pasternak and Bailey (2004) state that "teachers who are perceived as speaking a language other than English as their mother tongue—regardless of their actual proficiency with English—are typically labeled as "nonnative" speakers" (p. 156). Labeling teachers as nonnative speakers can sometimes provoke perceptions that they are not as proficient as their native-speaking counterparts (Kamhi-Stein, 1999). As a result, teachers labeled as nonnative speakers of English have a difficult time competing with NESTs for teaching positions in both ESL and EFL contexts (Braine, 1999). Researchers such as Cook (2000) and Medgyes (1992) point out that such discrimination in hiring ESL/EFL teachers is based on the assumption that students disfavor NNESTs. In general, it is believed that listeners who have difficulty in understanding a speaker are likely to experience negative affect (White & Li, 1991). Munro and Derwing (1995) conducted a detailed study with regard to the effect of foreign accents on speech perception

by native English listeners. The researchers suggest that the listeners' negative perceptions toward foreign-accented speech may be the result of "reduced intelligibility as well as from awareness of increased processing demands" (p. 302). Munro and Derwing (1995) also speculate that awareness of increased processing time may cause listeners to assess some foreign-accented messages as harder to understand than unaccented ones, even when comprehension eventually does occur. Based on these notions, it can be hypothesized that L2 learners' negative attitudes are the result of reduced intelligibility of NNESTs' foreign-accented speech. In addition, L2 learners perceive NESTs as "language models" (Medgyes, 2001, p. 436) because of their "true" and/or "correct" pronunciation of English, whereas NNESTs' English is perceived as not perfect (Mahboob, 2004). Thus, ESL and EFL students prefer listening, pronunciation, and speaking classes instructed by NESTs to those instructed by NNESTs (Mahboob, 2004; Moussu, 2002; Kelch & Santana-Williamson, 2002). Mahboob (2004) states that the "emphasis on pronunciation by the students may be one factor that influences administrators' perception that students do not want nonnative teachers" (p. 141). Language learners' perceptions of NNESTs' foreign accent per se, again, cannot explain the complex phenomena of foreign accent. Thus, an empirical investigation needs to be conducted on NNESTs' foreign accent in reference to its effect on intelligibility to better understand the issues related to NNESTs' accentedness.

The purpose of this study was twofold. First, the study investigated the effect, if any, of NNESTs' foreign accent on ESL students' different degrees of understanding. This is best done by distinguishing different dimensions of speech: accentedness (e.g., foreign accent), comprehensibility, intelligibility, and interpretability. In this study, *foreign accent* was defined as a phonological (pronunciation) characteristic that marks a speaker as a nonnative speaker of a language; *comprehensibility* was defined as listeners' perceived estimation of difficulty in understanding an utterance. It is noteworthy here that in previous research into foreign-accented speech (e.g., Derwing & Munro, 1997; Munro & Derwing, 1995), accentedness, comprehensibility, and intelligibility were the three common measures. As mentioned earlier, the validity and reliability of word transcription have been challenged (Zielinski, 2004). For this reason, in this study, the term *intelligibility* was restricted to listeners' recognition of words or other sentence-level elements of utterances, and the term *interpretability* was defined as listeners' recognition of the meaning and/or intent attached to a word or utterance. The study investigated the relations among these variables.

Second, the study investigated the credibility of ESL students' perceptions about NNESTs' foreign accent. The credibility was assessed based on the hypothesis that ESL students' negative attitudes were the result of reduced intelligibility and interpretability of NNESTs' foreign-accented speech.

Method

Participants

The speech stimuli were elicited from 4 female graduate student volunteers between the ages of 28 to 39, all of whom were enrolled in a MATESOL

program in the US. The gender was controlled to eliminate any gender bias. All of the speakers had significant experience in ESL teaching, ranging from 1.5 to 10 years. The speakers had different native language backgrounds: a native speaker of American English, Spanish, Japanese, and Korean, who will be referred to here as ENG-NEST, SPAN-NNEST, JAP-NNEST, and KOR-NNEST, respectively. On a survey, the NNESTs indicated that their foreign accents were noticeable. The NNESTs were also asked to self-rate their accentedness on a Likert scale from 1 = no foreign accent to 9 = very heavy foreign accent. The JAP-NNEST, SPAN-NNEST, and KOR-NNEST rated their accentedness 3, 4, and 6 on the scale, respectively. In addition, all 4 speakers reported on the survey that they altered their speech—simple vocabulary, speech rate, articulate pronunciation, and so forth—when speaking to ESL students in class.

Forty ESL students (22 males and 18 females) voluntarily participated as listeners in the present study. All were enrolled in the English Language Program (ELP) at a university in the US. ELP is an Intensive English Program that offers various ESL courses as well as Test of English as Foreign Language (TOEFL) preparation courses. The English proficiency of the students ranged from intermediate to advanced level. The mean age of the listeners was 24.3 (SD = 3.36) ranging from the age of 18 to 30. The mean length of residence in the US was 3.75 months (SD = 2.93) with a minimum of 1 month and a maximum of 12 months. The listeners varied in their L1 backgrounds: Chinese (n = 21), Korean (n = 5), Arabic (n = 5), Japanese (n = 4), Mongolian (n = 2), French (n = 2), and Spanish (n = 1).

Construction of the Foreign Accent Attitude Questionnaire

A survey is a useful tool to gather "information about affective dimensions of teaching and learning, such as beliefs, attitudes, motivations, and preferences" (Richards & Lockhart, 1994, p. 19). For the purpose of this study, the Foreign Accent Attitude Questionnaire was designed to elicit the participants' attitude toward NNESTs' foreign accent. The first of the two sections of the questionnaire consisted of questions regarding participants' demographic information; the second section comprised 25 statements in reference to NNESTs' foreign accent. Several factors were considered in designing the questionnaire: (a) avoidance of neutral word phrases such as "ESL students like/think …" (see Dornyei, 2003), (b) avoidance of complex sentence structure and low-frequency vocabulary in that target subjects were ESL learners, and (c) use of the phrase "ESL teacher with a foreign accent" in order to restrict participants' attitude toward only *nonnative* English-speaking teachers with a foreign accent in that the native/nonnative division is one of the most complex and elusive areas not only in applied linguistics but in the ELT profession. Finally, below each statement, a Likert scale with 5 labeled points (i.e., *Strongly Agree, Agree, Not Sure, Disagree,* and *Strongly Disagree)* was given. The participants were asked to mark the point that corresponded to their beliefs or feelings about the given statement.

Construction of the Speech Stimuli

Individual recording sessions were held for each speaker. The speakers

were provided a list of 20 academic words, which were extracted from "A New Academic Word List" (Coxhead, 2000). The speakers were instructed to choose a word from the list and then describe the selected word. In their description of the word, the speakers were asked to enunciate the word, provide its spelling, explain its meaning, and provide an example using the word in a phrase or sentence. Before the recording, the speakers were informed that their target audience was ESL students. Kachru (1985) asserts that "the whole concept of intelligibility is open to question if we do not include the appropriate parameters of the context of situation as relevant to intelligibility at various levels" (p. 106). In addition, it has been reported that linguistic adjustments are made by teachers to make their input comprehensible to their students (Owen, 1996). For the purpose of this study, it was important that the speakers fully understand the context of speech. No rehearsal was allowed, nor were there any verbal exchanges between the researcher and the speaker during the recording.

To assess accentedness, comprehensibility, and interpretability of the speakers, their extemporaneous descriptions were recorded on a digital voice recorder and then converted to computer audio files. The stimuli somewhat varied in length, ranging from 18 seconds (21 words) to 32 seconds (37 words). The mean length of the stimuli was 23 seconds (29 words). The mean speech rate was 61.96 words per minute, whereas, in general, the normal speech rate is 120-140 words per minute.

It had been shown from a pilot study that the length of the extemporaneous description-speech samples was inappropriate for the ESL students to assess intelligibility of the speakers, that is, dictation tasks. Therefore, a short single continuous-speech sample was extracted from each extemporaneous description-speech stimulus. Rather than arbitrarily controlling the duration of or the number of words in each excerpt, the full-length speech samples were edited into utterances involving syntactically complete phrases that were as natural as possible. There were no particular criteria for selection, except that the excerpts had to contain the academic word and its spelling. In addition, for dictation convenience, each excerpt was divided into three successive bits (e.g., A, B, and C); each bit was repeated twice back-to-back with a 5-second pause between the bits followed by the whole excerpt (e.g., A-A-B-B-C-C-ABC). The length of the final edited excerpts ranged from 1 minute 5 seconds to 1 minute 17 seconds (*M* = 1 minute 7 seconds). The digital audio-editing software WavePad was used for editing the stimuli.

Procedure for Data Collection

The data were collected from four classes (two intermediate levels and two advanced levels) with the consent of the research subjects' teachers. Each class had an average of 10 ESL students. For each class, listeners, that is, the ESL students, were first informed that their participation in the study was voluntary. The students were also informed that the individual results would be kept confidential. There were no incentives given for participation.

Two sessions were held to collect the data. Both sessions were conducted in the ESL students' actual classrooms. In Session 1, to assess the ESL students'

attitude toward foreign accent, the students were instructed to complete a Foreign Accent Attitude Questionnaire. During the first session, the students were allowed to ask any questions regarding the questionnaire and to use dictionaries, if necessary. The session took about 10 minutes.

Upon completion of the Foreign Accent Attitude Questionnaire, Session 2, which was a listening session, was briefly introduced. First, the ESL students were instructed to listen to a speech stimulus—the full-length extemporaneous speech. After listening to the stimulus, the ESL students were asked (a) to rate the speaker's accentedness on a 9-point Likert scale[2] from 1 = no foreign accent to 9 = very heavy foreign accent; (b) to answer a comprehension question (multiple-choice format) that was designed to measure the listeners' content understanding; and (c) to rate how difficult or easy it was to understand the speech on a Likert scale ranging from 1 = very easy to understand to 9 = very difficult to understand. It has been suggested that repeated hearing of an utterance might result in harsher ratings of accentedness (Munro & Derwing, 1994). Therefore, accentedness was the first variable to be evaluated.

Upon completion of the three tasks, the students were asked to write out the utterance in standard orthography while listening to the excerpt in order to assess the speaker's intelligibility. The students were informed that the excerpt was divided into three bits and that each bit would be repeated twice, followed by the complete excerpt (i.e., A-A-B-B-C-C-ABC). Regarding transcription-data analysis, the intelligibility score was generated in terms of the proportion of words exactly matching the original transcription, confirmed by the speaker. On average, Section 2 took approximately 30 minutes to complete. A short familiarization session was given to the subjects before beginning the tasks, during which they practiced on a stimulus not used in the actual study.

Results

Internal Consistency Reliability

The internal consistency reliability, that is, Cronbach's Alpha, of the responses to the Foreign Accent Attitude Questionnaire was 0.81, which is generally believed to be acceptable. This result suggested that the participants in this study responded similarly to the statements that were all measuring the same construct, that is, perceptions about NNESTs' foreign accent.

Attitude Toward Foreign Accent

Before presenting the results of the ESL students' attitude toward NNESTs' foreign accent, it is noteworthy that the ESL students' responses for some notions were more salient than others. Regarding the 25 statements in the Foreign Accent Attitude Questionnaire, more than 80% of 40 ESL students either strongly agreed or agreed with the following four statements:

- ESL teachers should all speak with a native English accent.
- ESL students come to the US to study English with ESL teachers with a native accent.
- Pronunciation classes should be taught by ESL teachers with a native accent.

- ESL teachers with a native accent can teach pronunciation classes better than ESL teachers with a foreign accent.

These results parallel those of previous studies (e.g., Mahboob, 2004; Morita, 2004; Tang, 1997) in offering support of the view that ESL students prefer to study with NESTs rather than NNESTs. The responses to other statements regarding the ESL students' general attitudes toward NNESTs' foreign accent were somewhat mixed. For example, the responses to the statement "It is OK for ESL teachers to have a foreign accent" were mixed: About half (52.5%) of the students disagreed or strongly disagreed, whereas a little less than half (42.5%) agreed or strongly agreed; 5% were not sure. When asked a similar question regarding foreign accentedness of speakers with other occupations, such as bankers or taxi drivers, 67.5% responded it is OK for them to have a foreign accent, whereas only a small number (15%) disagreed. Previous studies into foreign accent report that the context in which communication occurs can significantly influence listeners' perceptions about and acceptance of foreign accents (Callan, Gallois, & Forbes, 1983; Ryan & Carranza, 1975). The results in this study show that a speaker's occupation can also influence listeners' perceptions about and acceptance of foreign accents.

Maybe because of the effect of context and a speaker's status on listeners' perception of foreign accents, most of the ESL students showed certain linguistic expectations for ESL teachers, such as that ESL teachers should all speak with a native English accent; more than 80% of the ESL students agreed on this notion. In addition, more than half (60%) of the ESL students agreed with the statement "ESL teachers with a foreign accent are more difficult to understand than ESL teachers with a native accent." It seems the ESL students' belief that a foreign accent reduces intelligibility has influenced their attitudes toward NNESTs' professional/pedagogical skills. More than half (55%) of the students perceived that NESTs are better teachers than NNESTs. In addition, 47.5% of the students believed that an ESL teacher's pronunciation is a more significant criterion than teaching experience for judging who is a good teacher. A little more than one-third (35%) of the students approved the idea that ESL teachers with a foreign accent can correct students' pronunciation. Moreover, only 22.5% of the students supported the notion that NNESTs can teach pronunciation classes. Interestingly, more than half (57.5%) of the students believed that they would "pick up" their teacher's accent. This pick-up-teacher's-accent belief might be the source of the perception that NESTs are the language models because of their "true" and/or "correct" pronunciation of English, which the students could "pick up," whereas NNESTs' English is perceived as not perfect. Thus, ESL and EFL students prefer listening, pronunciation, and speaking classes instructed by NESTs to those instructed by NNESTs (Kelch & Santana-Williamson, 2002; Mahboob, 2004; Moussu, 2002).

Additionally, when asked if all NNESTs have a foreign accent, the responses were mixed: 32.5% of the students agreed, 32.5% disagreed, and 35% were not sure. It seems that many ESL students did not equate the term "ESL teachers with a foreign accent" with NNESTs. Based on these findings, it could be argued that associating foreign accentedness to all NNESTs would be problematic in that the ESL students are somewhat aware of the fact that not

all NNESTs have a foreign accent. Thus, research using the term "NNEST" without its clear definition can be questioned for its validity and reliability.

Analysis of the Stimuli

The mean rating and score of accentedness, comprehensibility, interpretability, and intelligibility for each speaker is shown in Table 1.

Table 1
Mean Rating and Score of Variables

	Accentedness	Comprehensibility	Interpretability (N = 40)	Intelligibility (%)
ENG-NEST	2.40	3.63	17	77.78
KOR-NNEST	3.70	3.68	31	77.23
JAP-NNEST	4.12	3.82	19	82.74
SPAN-NNEST	5.07	3.98	18	84.56

Note: *Accentedness: 1 = Native accent to 9 = Very heavy foreign accent*
Comprehensibility: 1 = Very easy to understand to 9 = Very difficult to understand
Interpretability: Number of students who answered the comprehension question correctly
Intelligibility: Percentage of actual word match

Analyses of the Speakers' Accentedness

The stimulus produced by ENG-NEST received the lowest mean accent rating (i.e., the most nativelike) of 2.40 (SD = 1.88) with the skewness coefficient value[3] of 2.0. The highly skewed distribution indicates that the accent ratings were clustered together at nativelike rating range; 70% of the ESL students gave the rating of 1 or 2. The mean accent rating for the KOR-NNEST, JAP-NNEST, and SPAN-NNEST was 3.70 (SD = 2.15) with the skewness .53, 4.12 (SD = 1.88) with the skewness .20, and 5.07 (SD = 2.44) with the skewness .27, respectively. The high standard deviation and low skewness of the NNESTs' accent ratings show that the perceived ratings were fairly symmetric. The result of a one-way ANOVA and a Tukey test, however, indicated that there was a significant statistical difference between the mean accent ratings for ENG-NEST and those for NNESTs (F (3, 156) = 10.91, p < .05). It seems that the ESL students' accent ratings were somewhat successful in discriminating between native English and L2 speakers. In addition, this result supports the ESL students' perception about the ability to distinguish NNESTs from NESTs by their accentedness. The results of the Foreign Accent Attitude Questionnaire in this study showed that most of the students (77.5%) stated that they can distinguish NESTs from NNESTs by their accent. In other words, there was an association between the ESL students' perception about and action on distinguishing NNESTs from NESTs by their accentedness.

As the ESL students who participated in this study comprised two different levels (the intermediate and the advanced level), a descriptive analysis of the accent ratings was carried out for each level. The intermediate ESL

students rated the accentedness of all the stimuli more harshly than the advanced ESL students did, except for SPAN-NNEST. However, the mean accent rating difference between the two groups for SPAN-NNEST was small (0.15). The result of an independent t test showed a statistically significant difference between the means of the two groups ($t = 2.07$, $df = 158$, $p = .04$, two-tailed). The results of a one-way ANOVA and a Tukey test for each level showed a statistically significant difference between ENG-NEST and NNESTs in the advanced-level group ($F (3, 76) = 10.95$, $p < .001$), but no statistical difference among the 4 speakers in terms of accentedness was found in the intermediate-level group. This finding is consistent with Flege's (1988) results: The more experienced listeners distinguished native speakers from nonnative speakers to a significantly greater extent than the less experienced listeners.

Analyses of the Speakers' Interpretability

The term "interpretability" in this study was defined as the recognition of a meaning and/or intent attached to a word or utterance. Each ESL student answered a comprehension question that was in a multiple-choice format. As shown in Table 1, KOR-NNEST scored the highest; 31 (77.5%) students correctly comprehended the content of the speech. About half of the students correctly answered the question regarding the content of speech delivered by the other 3 speakers. As a result, there was a statistically significant difference ($F (3, 156) = 4.570$, $p < .05$) between KOR-NNEST and the other 3 speakers. The cause of the uniquely high interpretability score for KOR-NNEST is unclear. One possible explanation could be that the ESL students already knew the meaning of the word that KOR-NNEST was describing. Thus, they did not have to rely on the content of KOR-NNEST's speech. No other statistically significant mean difference between other speakers was found. In reference to understanding content of the speech, no one speaker was better understood than the others, except for KOR-NNEST.

Analyses of the Speakers' Comprehensibility

The term "comprehensibility" in this study was defined as listeners' perceived estimation of difficulty in understanding an utterance. The mean rating of ENG-NEST's speech was 3.63 ($SD = 2.20$), SPAN-NNEST speech 3.98 ($SD = 1.95$), JAP-NNEST speech 3.82 ($SD = 1.82$), KOR-NNEST speech 3.68 ($SD = 2.00$) for their comprehensibility (1 = very easy to understand and 9 = very difficult to understand). No statistically significant difference among the four means of perceived comprehensibility ratings was found. In other words, no one stimulus was perceived to be more difficult or easier to understand than the others. The mean perceived comprehensibility ratings from two different L2 proficiency groups were submitted to a t test. The results indicated that there was a statistically significant difference between the two means ($t = 2.87$, $df = 158$, $p < .05$, two-tailed). The students in the advanced level perceived all 4 speakers to be easier to understand than those in the intermediate level. No significant statistical difference existed among the speakers' perceived comprehensibility in both groups.

Analyses of the Speakers' Intelligibility

In this study, the term "intelligibility" was restricted to the recognition of words or other sentence-level elements of utterances (Smith & Nelson, 1985). The mean intelligibility score for the stimulus produced by each speaker is shown in Table 1. There was no indication of statistical difference between the speakers regarding their intelligibility as perceived by the ESL students. Interestingly, SPAN-NNEST, who was perceived to have the heaviest foreign accent and to be most difficult to understand, received the highest intelligibility score of 84.56, that is, 84.56% of the words in the speech of the SPAN-NNEST were correctly transcribed by the students.

Correlations Among Variables

To investigate the correlations, if any, between the variables, a Pearson correlation coefficient was computed. Table 2 presents the correlations between variables.

Table 2
Matrix of Correlations Between Variables

Variables	Accentedness	Comprehensibility	Intelligibility	Interpretability
Accentedness	1	0.503**	-0.041	-0.022
Comprehensibility		1	-0.008	0.050
Intelligibility			1	0.159*
Interpretability				1

Note: The numbers refer to a Pearson correlation coefficient (r)
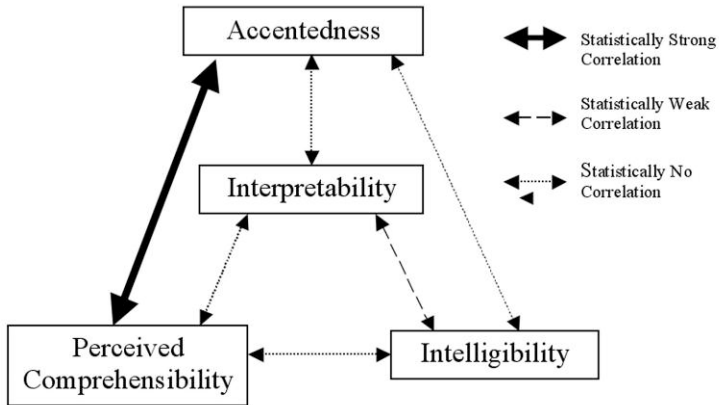** Significant at the level 0.05 (two-tailed)*
** Significant at the level 0.001 (two-tailed)

The results of the Pearson correlation analysis indicated that there were no statistically significant correlations (a) between the speakers' perceived accentedness and intelligibility, (b) between the speakers' perceived accentedness and interpretability, (c) between perceived comprehensibility and intelligibility, and (d) between perceived comprehensibility and interpretability. There were, however, statistically significant correlations between the speakers' accentedness and perceived comprehensibility ($r = 0.503$, $p < 0.001$, two-tailed) and between the speakers' intelligibility and interpretability ($r = 0.156$, $p < 0.05$, two-tailed). The strength of the correlations among variables is shown in Figure 1.

The speakers' Pearson correlation coefficient between the accent ratings and perceived comprehensibility ratings ranged from 0.446 to 0.717 ($p < 0.01$, two-tailed). The correlation between ENG-NEST's accent and comprehensibility rating was the smallest ($r = 0.466$, $p < 0.01$, two-tailed). The correlations between the NNESTs' accent and comprehensibility ratings were stronger than that of ENG-NEST: a Pearson correlation coefficient of 0.599 for KOR-NNEST and 0.717 for JAP-NNEST ($p < 0.01$, two-tailed). Although no statistically significant correlation between SPAN-NNEST's accented ratings and perceived

comprehensibility ratings appeared ($r = 0.209$, $p < 0.01$, two-tailed), the positive sign of the correlation coefficient indicated the direction of correlation: the lower the accent rating, the lower the perceived comprehensibility rating.

Figure 1
Strength of Correlation Between Variables

In regard to the ESL students' language proficiency (i.e., the intermediate and advanced level), the results showed that no statistically significant correlation between the variables appeared in either level, except for the correlation between accent ratings and perceived comprehensibility ratings: the Pearson correlation coefficient of 0.489 ($p < 0.001$, two-tailed) for the intermediate group and 0.323 ($p < 0.001$, two-tailed) for the advanced group. The correlation between the accent ratings and perceived comprehensibility ratings in the intermediate level was stronger than that in the advanced level. The results also showed that the Pearson correlation coefficient between the accent ratings and perceived comprehensibility ratings was 0.324 ($p < 0.001$, two-tailed) for the ESL students who correctly responded to the interpretability task, whereas the Pearson correlation coefficient was 0.552 ($p < 0.001$, two-tailed) for those who did not.

The finding of no statistically significant correlation between perceived comprehensibility and interpretability and between perceived comprehensibility and intelligibility in this study is consistent with that of Matsuura, Chiba, and Fujieda (1999). The researchers conclude that even if nonnative speakers of English perceived an utterance to be easy to understand, it did not necessarily mean that they could transcribe the words or understand the message correctly. Moreover, the result of this study also showed that high intelligibility scores did not necessarily entail high interpretability scores. In other words, recognition of words might not necessarily correlate perfectly with the actual understanding of the full message intended by the speaker. It appears that, for ESL students, understanding an utterance is a complex issue that has different degrees of understanding: perceived comprehensibility, intelligibility, and interpretability.

Credibility of ESL Students' Attitudes

The data showed that most of the students believed that a foreign accent was an issue of NNESTs' capability to be understood. To investigate whether this perception was reliable, correlational analysis was conducted separately for the students who held different attitudes. The 24 students who responded "strongly agree" or "agree" with the statement "ESL teachers with a foreign accent are more difficult to understand than ESL teachers with a native accent" were pooled to create Group 1. The 10 students who responded "not sure" were Group 2 and the 6 students who responded "strongly disagree" or "disagree" were Group 3. The data for accent ratings, perceived comprehensibility ratings, intelligibility scores, and interpretability scores for each group were analyzed. The results showed that all three groups had statistically significant correlations between the accent ratings and perceived comprehensibility ratings. Group 1 showed the highest correlation coefficient ($r = 0.643$, $p < 0.01$, two-tailed). The correlation coefficient was 0.311 ($p = 0.05$, two-tailed) and 0.439 ($p < 0.05$, two-tailed) for Group 2 and 3, respectively. It seems that the students in Group 1 were more influenced by the speakers' accentedness in determining the perceived comprehensibility than those in Group 2 and 3. However, it is noteworthy that Group 1 had 24 subjects, Group 2 had 10, and Group 3 had 6. The effect, if any, of the difference in number of subjects in each group on the strength of correlation is unknown.

Discussion

In previous studies, it has been reported that a variety of factors, such as degree of foreign accentedness, familiarity of certain accent, bias against foreign-accented speech, and/or the like, might affect listeners' responses to L2 speech. Munro (2005, as cited in Munro, Derwing, & Morton, 2006) asserts that research into intelligibility, comprehensibility, and accentedness must consider two factors: stimulus properties and listener factors that relate to the listeners' language experience and accent familiarity. It has been argued that a high degree of consensus among a diverse group of listeners' responses to L2 speech would be expected, if the influence of stimulus properties is stronger than the influence of listener factors. In contrast, low or even no interrater agreement would exist regarding intelligibility, comprehensibility, and accentedness if such ratings or scores were highly subjective and affected by listener factors (Munro, Derwing, & Morton, 2006). Taking these notions and the evidence presented in this study into account, one could suggest that stimulus properties and listener factors both might influence the ESL students' judgments of accentedness. The data in this study showed a high degree of consensus among experienced learners on the concept of what a native English accent "ought" to sound like: Most of the accent ratings on ENG-NEST's speech were clustered on or near the native-accent rating point, whereas less experienced learners were more subjective in rating ENG-NEST's speech. Thus, experienced ESL students were profoundly influenced by stimulus properties in judging a native English accent. In reference to nonnative accent judgments, no interrater agreement emerged in this study. Regardless of ESL students' proficiency level, NNESTs' accent ratings were subjective; as a result,

the accent ratings were scattered. The interpretation of these findings could be that at a certain stage of the interlanguage continuum, language learners develop a concept of what a native English accent "ought" to sound like. Thus, language learners' detection of any deviation from the concept is possible: They are somewhat able to distinguish native speakers from nonnative speakers. However, the degree of deviation, that is, foreign accentedness, is subjective. Thus, foreign-accent ratings might be more influenced by listener factors than by stimulus proprieties.

With respect to listeners' responses to speech comprehensibility, that is, listeners' perceived estimation of difficulty in understanding an utterance, previous studies report that accent ratings cannot be relied upon as a means of assessing comprehensibility (Munro & Derwing, 1995). The evidence in this study, however, suggests that comprehensibility may be more in the mind of the listeners than in the mouth of the speaker. This study showed that listeners' perceived foreign accentedness was an overwhelmingly important factor that influenced the speaker's comprehensibility. Although no one speaker was perceived to be more difficult or easier to understand than the others, statistically significant positive correlation between accent ratings and comprehensibility ratings was found ($r = 0.503$, $p < 0.001$, two-tailed). In other words, a speaker who was perceived to have a heavier foreign accent was perceived to be more difficult to understand by the listeners, that is, ESL students. In addition, less experienced ESL students relied more on the perceived foreign accentedness in determining speech comprehensibility than experienced ESL students did. Here I carefully suggest that listener factors and stimulus properties should be considered more of a continuum than a dichotomy.

In general, one would expect to see some degree of correlation among comprehensibility (listeners' estimation of difficulty in understanding an utterance), intelligibility (recognition of words or other sentence-level elements of utterance), and interpretability (recognition of a meaning and/or intent attached to a word or utterance) in that understanding of meaning and intention attached to an utterance entails word recognition, which in turn corresponds with listeners' perceptions of speech comprehension. It has been reported that accentedness, perceived comprehensibility, and intelligibility (Munro and Derwing define intelligibility as actual understanding of an utterance) of a speaker are related but are partially independent dimensions (Derwing & Munro, 1997). However, this study showed somewhat different results. The data of this study suggest that accentedness, perceived comprehensibility, intelligibility, and interpretability of the ESL teachers of different language backgrounds from the perspectives of the ESL students were all independent dimensions, except for the influence of perceived accentedness on perceived comprehensibility of the speakers. The first evidence supporting this notion is that accent ratings showed statistically significant correlation with comprehensibility ratings. Second, although there was a correlation between intelligibility scores and interpretability scores, it was not only weak but mainly due to one speaker, that is, KOR-NNEST, who received a salient interpretability score. Third, the results showed that there was no statistically significant correlation between subjective judgments and objective measures: no statistically significant correlation (a) between accent

ratings and intelligibility score, (b) between accent ratings and interpretability scores, (c) between comprehensibility ratings and intelligibility scores, and (d) between comprehensibility ratings and interpretability scores.

These findings support and at the same time contrast with those of previous studies. The results of this study support Munro and Derwing's (1995) notion that accent ratings are poor indicators of actual understanding of an utterance in that this study found no correlation between the two variables. In respect to speech comprehension, previous studies have reported that perceived comprehensibility ratings correspond to the degree of actual understanding of an utterance (Munro & Derwing, 1995). This study found no evidence to support this notion: No statistically significant correlation between (a) comprehensibility ratings and intelligibility scores and (b) comprehensibility ratings and interpretability scores was found. Thus, perceived comprehensibility was a poor indicator of objective measures of speech comprehension, such as ESL students' actual recognition of words (intelligibility) and meaning and/or intent attached to a word or utterance (interpretability). The existence of dissociation between listeners' perceived understanding of and actual understanding of an utterance, at least for ESL students, indicates that ESL students might mistakenly believe that NNESTs' speech is difficult to understand just because of the presence of a foreign accent, regardless of their ability to recognize the words or meaning/intention attached to an utterance.

Another subjective judgment, that is, ESL students' attitudes and beliefs toward foreign accent, might have an influence on other subjective judgments such as comprehensibility ratings, yet it was a poor indicator of objective measures. Those who believed that reduced intelligibility and interpretability were the result of a foreign accent relied more on perceived foreign accentedness in judging comprehensibility than those who did not have such beliefs. However, no statistically significant correlation was found between subjective judgments and objective measures of speech comprehension, regardless of their beliefs toward foreign accent. Listeners' attitudes toward foreign accent elicited from a questionnaire or survey rightfully have a place in research. It seems that the use of only subjective judgments might not accurately represent the complexity of a variable, foreign accent in this case in question, however. One other concern regarding questionnaires is the use of ambiguous terms such as "understand" in a statement or question. It is uncertain whether respondents interpreted the term "understand" as recognition of a word or expression, the meaning, or what the meaning signifies in the sociocultural context (Bamgbose, 1998). Thus, I argue that methodological limitations such as the use of only subjective judgments and ambiguous terms such as "understand" without any clarification might jeopardize the validity and reliability of the results and evaluation of foreign accent research.

Conclusion and Implications

It is hoped that the findings presented in this study will provide fundamental evidence for accurate understanding of the complex phenomenon of nonnative speakers' foreign accent in general and NNESTs'

foreign accent in particular in reference to its effect on intelligibility. This study, in which ESL students of different language backgrounds and proficiency levels responded to stimuli generated by 4 ESL teachers from different language backgrounds, investigated the effect, if any, of NNESTs' foreign accent on ESL students' different degrees of understanding. It was found that accentedness, perceived comprehensibility, intelligibility, and interpretability of the ESL teachers of different language backgrounds from the perspectives of ESL students were all independent dimensions, except for an influence of accentedness on perceived comprehensibility. The perceived degree of foreign accent did have an influence on the perceived degree of comprehensibility, that is, the speaker who was perceived to have a heavier foreign accent was perceived to be more difficult to understand. The presence of a foreign accent, however, did not result in reduced intelligibility and interpretability. In other words, the perceived degree of foreign accent did not elicit a cost in recognition of words and their meaning and intent in an utterance. As a result, the hypothesis that ESL students' negative attitudes toward NNESTs' foreign accents are the result of reduced intelligibility and interpretability was not supported in this study. ESL students' negative attitudes toward NNESTs' foreign accent might be the result of their unjustified beliefs that native accent is the ideal pronunciation and any variations of it are not just different but difficult. Thus, it could be argued that validity and reliability are questionable regarding ESL students' notion that ESL teachers with a foreign accent are more difficult to *actually* understand than ESL teachers with a native English accent.

The implications of the findings in this study are several. First, from the NNESTs' perspective, the study showed that accentedness, perceived comprehensibility, intelligibility, and interpretability of NNESTs were all independent dimensions, except for an influence of accentedness on perceived comprehensibility. Therefore, ESL students might mistakenly believe that NNESTs' speech is difficult to understand just because of the presence of a foreign accent, regardless of their ability to recognize the words or meaning/intention attached to an utterance. The implication of this finding is that in addition to the multidimensional nature of L2 speech and its complexity, the notion that, for ESL students, understanding an utterance is a complex phenomenon that has different degrees of understanding—perceived comprehensibility, intelligibility, and interpretability—needs to be taken into consideration by NNESTs in order to better understand the dynamics of ESL students in the classroom. Second, it is only fair for program administrators to hire ESL/EFL teachers who are intelligible. If intelligibility, in a general sense, is accepted as an important hiring criterion, then ESL teachers' accentedness should be of no concern in regard to this criterion in that the strength of a foreign accent does not necessarily decrease speakers' intelligibility and interpretability. Finally, in respect to English language assessment such as the Test of English as Foreign Language (TOEFL), the results of this study suggest that (a) although some researchers have reported that use of foreign accented speech in testing "is likely to disadvantage test takers" (Major, Fitzmaurice, Bunta, & Balasubramanian, 2005, p. 64), I argue that foreign-accented speech does not violate the fairness of a test and (b) when rating a speaking test,

speakers' strength of foreign accent should be differentiated from speakers' intelligibility in that accentedness and intelligibility are two different dimensions.

The views expressed in this article are those of the author and do not reflect the official policy of the Defense Language Institute Foreign Language Center, Department of Army, Department of Defense, or U.S. government.

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Endnotes

[1] In this study, the term NNEST is restricted to "English teacher with a foreign accent" and they will be used interchangeably. However, it is noteworthy that not all NNESTs have a foreign accent.

[2] Southwood and Flege (1999) report that foreign accentedness is a metathetic continuum, which means it is appropriate to use an interval scale (e.g., Likert scale) for scaling of degree of perceived foreign accent. It is also reported that 9-point Likert scales can avoid ceiling effects.

[3] The skewness coefficient value is a measure of the asymmetry of a frequency distribution: greater than 1 or less than -1 indicates a highly skewed distribution, between .5 and 1 or -.5 and -1 is moderately skewed, and between -.5 and .5 indicates that the distribution is fairly symmetric.

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