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Comprehensibility and intelligibility of international student speech: Comparing perceptions of university EAP instructors and content faculty



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ABSTRACT

Many international students at U.S. universities study in intensive English courses to improve their language skills before taking content-oriented courses toward their degrees. English for Academic Purposes (EAP) instructors in intensive courses and university faculty in content courses both listen to international student speech, but it is unclear whether they perceive it similarly or differently. In the present study, two groups (Content Faculty and EAP Instructors) provided comprehensibility ratings and transcribed an excerpt of speech from international students. Both groups of participants answered questions about their experience with the English of international students and other non-native speakers and their attitudes towards the English proficiency of international students. Comprehensibility ratings and intelligibility scores for both groups were similar, but EAP Instructors were able to transcribe more accurately for less-intelligible speakers. Content Faculty with negative attitudes towards international students' language abilities gave lower comprehensibility ratings than those with positive attitudes, even though their transcription accuracy was equivalent. These results strengthen our understanding of the relationship between comprehensibility and intelligibility and have implications for university EAP curricula.

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In recent years, international student enrollment has increased markedly at many universities in English-speaking countries (Fischer, 2014). With numbers of international students reaching at least 10% of the student body at 51 U.S. universities in the 2014–2015 school year (US News & World Report, 2016), issues of mutual comprehensibility between international students and their professors and classmates have gained salience in discussions of pedagogy and policy. At one US university, a recent survey of faculty found that 73% of respondents expressed concern about the oral communication skills of international undergraduates, with “an overwhelming sense that non-native speaking students are taking courses before their English language proficiency is adequate” (Evans, 2014, p. 2). When international students are under-prepared in language, it can lead to negative outcomes such as a loss of confidence for students and a lack of respect for the skills and knowledge these students bring to their universities (Ryan & Viète, 2009).

Many international students in the U.S.A. and other English-speaking countries study English in an intensive English program (IEP) prior to beginning their university degree programs. In an IEP, adult students take English language classes

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from EAP instructors on an intensive, full time basis (18–30 instructional hours a week). In some university IEPs, students can continue directly to university study after passing the final IEP course if they meet other admissions requirements of the university. This is the case at the university in the USA where this research was conducted.

University-based IEPs are EAP environments, aiming to prepare students with the language skills they will need for success in their university classrooms; implicitly, IEP instructors are preparing students with language skills to meet the expectations of other university teaching faculty. Both of these groups of instructors listen to the speech of international students, but there has been little research exploring the degree to which their perceptions match. Therefore, this study compares ratings of perceived comprehensibility and a measure of intelligibility for two groups of participants: faculty members teaching content courses and EAP instructors from the IEP.

1. Definitions

“Intelligible” and “comprehensible” both mean understandable. The ability to understand and be understood is essential for international students, as it is for any students. The terms “intelligibility” and “comprehensibility,” however, are not always consistently defined in the literature. For the purposes of this study, we adopt definitions used by [Munro and Derwing 1995; 2001; Derwing & Munro, 1997](#); and see an excellent summary in [Murphy, 2014](#), p. (261). Thus, intelligibility refers to the extent to which listeners can correctly identify the words they hear, often as measured by correct transcription. Comprehensibility, on the other hand, refers to the listeners' perception of the ease or difficulty with which they can make out a speaker's meaning, often measured by a rating on a 9-point Likert scale ([Munro & Derwing, 1995](#); see [Isaacs & Thomson, 2013](#); for a discussion of scale length).

Comprehensibility and intelligibility as defined above cannot be located exclusively with either the speaker or the listener ([Hustad, 2006; Zielinski, 2006](#)). Qualities of the speaker's speech such as speed and pronunciation will have an effect, as will qualities of the listener such as experience and attention. Successful communication depends on the efforts of both parties. Thus, a given sample of speech should not simply be identified as universally comprehensible or intelligible; it is essential to consider for whom a speech sample is comprehensible and/or intelligible, and in what contexts ([Lindeman & Subtirelu, 2013](#)).

2. What is the role of the listener in comprehensibility and intelligibility?

In order for communication to be successful, the listener must also do his or her part, and research has examined differences in comprehensibility and intelligibility using listeners with varied characteristics, and under varied listening conditions.

Listener L1 has been shown to have an effect on intelligibility of speech masked by noise, with L2 listeners better able to understand the speech of L2 speakers, even those with different L1s ([Bent & Bradlow, 2003](#)). When this effect has been tested in non-degraded speech, differences in intelligibility and comprehensibility due to the L1 of the listener, while significant, were much smaller than differences in results for individual speakers ([Munro, Derwing, & Morton, 2006](#)).

Familiarity with non-standard speech has been shown to facilitate transcription accuracy in laboratory studies when subjects listen multiple times to the same speaker or speakers with the same L1 ([Bradlow & Bent, 2008; Sidaras, Alexander, & Nygaard, 2009](#)), and this increase in intelligibility can extend even to novel accents ([Baese-Berk, Bradlow, & Wright, 2013](#)). Familiarity with the topic of the speech increases transcription accuracy as well ([Gass & Varonis, 1984](#)), and increased semantic context can facilitate both intelligibility and comprehensibility for sentences spoken by L2 speakers, while having no effect for comprehension of L1 speech ([Kennedy & Trofimovich, 2008](#)).

Mixed results have been found concerning the effects of listeners' life experience with non-standard speech. [Kennedy and Trofimovich \(2008\)](#) found that EAP teachers, having greater experience with the speech of language learners, transcribed more accurately but made similar comprehensibility judgments to inexperienced listeners. [Kang and Rubin's \(2009\)](#) findings likewise included a correlation between length of language teaching experience and successful transcription in a cloze procedure. [Derwing and Munro \(1997\)](#) found that self-reported familiarity with a language predicted subjects' ability to identify speakers of that language through their L2 English; this recognition in turn correlated with better intelligibility scores. However, listeners' reported familiarity with specific accents has also been found not to correlate with increased intelligibility or comprehensibility ([Munro et al., 2006](#)). Listeners' beliefs about pronunciation have shown little effect on accentedness judgments or intelligibility scores ([Hayes-Harb & Watzinger-Tharp, 2012](#)). Further, training listeners in linguistics, and/or cross cultural awareness has been found to affect subjects' attitudes towards speakers of non-standard English, but to have no effect on comprehension or intelligibility scores ([Derwing, Rossiter, & Munro, 2002](#)).

Listener attitudes in particular have been shown to affect listeners' perceptions of comprehensibility. For example, [Lindeman \(2002\)](#) demonstrated that, in an interactive communication exercise, listener attitudes influenced perception of communication success. All subjects with negative attitudes rated their communication as unsuccessful (even though two thirds of them were in fact successful based on objective measures) while those with positive attitudes were more likely to rate the communication as successful. That is, listener attitudes had a greater effect on perceptions of communication success than on actual communication success. [Kang and Rubin \(2009\)](#) also found greater effects from listener attitude on subjective measures of communication success than on more objective measures of comprehension.

3. Who is qualified to judge the comprehensibility and intelligibility of language learners?

Many of the studies cited above rely on the distinction between “native speakers” and “non-native speakers,” with the implied assumption that the judgments of native speakers are an appropriate standard to define intelligibility, comprehensibility, and “accentedness” in non-native speakers. The structure of these studies can contribute to misconceptions about non-native varieties of English, such as the ideas that only non-native speech has an accent, or that non-native speech is less intelligible and causes communication problems (Rajadurai, 2007).

In a world with more non-native speakers of English than native speakers (Jenkins, 2002), it is worth questioning whether the ratings and comprehension of the native listener are the most appropriate or helpful standard by which to judge the production of non-native speakers. A more appropriate standard might be mutual comprehensibility among non-native speakers of English (Jenkins, 2002; Murphy, 2014), or among subject groups with actual communication needs (e.g., undergraduate students and their professors).

The purpose of the current study is to compare perceptions of international students' speech between two different groups of instructors at the same university: EAP Instructors in an intensive English program (IEP), and Content Faculty members. The focus is on participants' ability to understand international student speech, not on their perceptions of accentedness. Thus the research questions are:

1. Do EAP Instructors and Content Faculty members have different impressions of how easy it is to understand international student speech? (Comprehensibility question)
2. Do EAP Instructors and Content Faculty members differ in their actual ability to understand international student speech? (Intelligibility question)

4. Method

4.1. Materials

Recordings of unrehearsed speech from an upper level IEP classroom were used. The class was a speaking and listening class, and students who passed this level completed the IEP and could begin their university studies. During the recording activity, each student was assigned a question, given 30 s to think about a response, and then required to speak for 60–120 s. Students had practiced this activity on several other occasions.

From multiple class sets, one class was chosen because the recordings were the clearest, with minimal background noise. The stimulus set includes 10 speakers, 7 male and 3 female, whose first languages are Mandarin Chinese ($n = 4$), Arabic ($n = 2$), Japanese ($n = 2$), Korean ($n = 1$), and Spanish ($n = 1$). The recordings vary in duration from 1 min 12 s to 2 min (details can be found in [Appendix 1](#)).

In addition to the full-length recorded speeches, brief extracts were used. These were excerpted from the same recordings by selecting the first complete sentence of appropriate length, since sentences at the beginning of the speech were more likely to be understood independently of surrounding text. Selected extracts were composed of 4–6 content words (nouns, main verbs, adjectives, adverbs, negations, and other content-carrying words). The length in total words or in seconds varied according to the speaker, but all were reasonably short for a proficient listener to hear and remember (details can be found in [Appendix 1](#)).

4.2. Participants

The materials were presented via an online survey to two groups of participants at the same university.

Group 1: Content Faculty were defined as professors and instructors who teach subjects other than world languages at the university. They were recruited via departmental email lists from the ten departments whose courses enrolled the greatest number of international students over the past two years. In addition, the link was published in a campus-wide newsletter, with a request for participation. Potential participants were instructed not to participate “if you are not a professor/instructor, or if you primarily teach language courses, or you don't have international students in your courses.” 42 surveys were begun, of which 24 were completed.

Group 2: EAP Instructors were recruited from the same university via a departmental email list. Potential participants were instructed to proceed only if they had taught an IEP speaking class within the last two years. 35 surveys were begun, of which 20 were completed.

Before beginning the study, all participants were instructed to listen using quality speakers, and to listen to each recording only once. Both groups answered two descriptive questions about their experience with international students and their other experience listening to non-native speakers of English (experience questions). After completing their ratings and transcriptions, each group was asked a question about whether the speakers they had just heard would be ready to begin university course work and a question about the adequacy of language proficiency in currently enrolled international students (attitude questions).

4.3. Measure of comprehensibility

Following convention in pronunciation studies (Isaacs & Thomson, 2013; Munro & Derwing, 1995), a 9-point Likert scale was used to measure comprehensibility. Comprehensibility ratings were collected while participants listened to the full (1–2 min) speeches. Listeners indicated the overall comprehensibility of the speaker on a scale from 1 to 9. They were directed to assign a 9 if the speech was very easy to understand, a 5 if the speech was completely comprehensible given significant special effort, and a 1 if the speech was mostly incomprehensible even with extra effort. Both groups listened to and rated all 10 speakers in random order.

4.4. Measure of intelligibility

Transcription accuracy was used to represent intelligibility, once again following convention. Both groups of participants completed the intelligibility measure after the comprehensibility measure. The 10 short excerpts were presented in random order, and participants were directed to listen once and then type what they heard, making a guess when they were unsure of a word.

Results were then coded as a match or a mismatch for each content word. Correct forms were determined from multiple careful listenings, in consultation with the classroom teacher of the speakers. Trivial errors such as regularizations and substitution of equivalent forms were disregarded (following the precedent of Derwing & Munro, 1997). For example, speaker 2 used the word “manner,” but “manners” was also coded as correct (regularization). Speaker 16 used the word “lots,” but “a lot” was also coded as correct (substitution of an equivalent form). An intelligibility score was assigned to each transcription based on the number of content words coded as matches divided by the total number of content words. For example, Speaker 4 said, “People don’t have the realize to protect the environment,” and one participant wrote, “People don’t have the real life to uh protect the environment.” The content words PEOPLE DON’T HAVE PROTECT ENVIRONMENT were coded as matches, and the content word REALIZE was coded as a mismatch. Thus, the intelligibility score was 5/6, or 0.83.

After one researcher coded all the transcription data, another researcher coded 10% of the data. The two researchers agreed on 241 out of 242 content words in this sample, or 99.59% agreement.

4.5. Measures of attitude and experience

To measure their attitude towards the English language skill of international students, participants entered text responses to two questions. Both groups were asked whether they believed the speakers they just heard would be ready to begin university course work. Content Faculty (Group 1) participants were also asked whether most international students in their current courses have adequate preparation in English language, while EAP Instructor (Group 2) participants were also asked about types of university course activities (such as presentations of discussions) at which they judged these students might be more able to succeed. Each response to these questions was coded as indicating positive, neutral (or uninformative), or negative attitude, as were additional comments volunteered in an option “anything to add?” field. Since each participant entered either two or three responses that were coded for attitude, two or more negative comments by a participant led to a negative attitude coding for that participant. The coding matched 100% between the two researchers.

Experience data was gleaned from a combination of answers to multiple choice questions about quantity and quality of interaction with international students in current university work, and a text-entry question about “any other significant experience with the spoken English of non-native speakers.” Both question types were considered together as two researchers coded each individual participant for high or low experience relative to other participants in the same group. Since experience with international student speech differed qualitatively between the two participant groups, these comparisons were made within groups only. Participants were coded by both raters independently, and initial agreement was 100% for Content Faculty and 71% for EAP Instructors. Discrepancies in the coding for EAP Instructors were discussed, and unclear cases were set aside from analysis in terms of experience.

5. Results

All partially completed surveys were disregarded, as was one Group 1 (Content Faculty) survey which was found to have been completed by an EAP instructor at the university level. This left results from 44 raters including 23 from Content Faculty and 21 from EAP Instructors. For one speaker (S9), several participants (from both groups) mentioned a problem with truncated playback. All analyses involving means across speakers were run both with and without data from this speaker, and no significant differences were found, so data is reported including results from this speaker.

5.1. Comprehensibility scores

On a scale of 1–9, where 9 is the most comprehensible, the mean comprehensibility rating of Content Faculty for all speakers was 5.63, while the mean rating of comprehensibility by EAP Instructors for all speakers was 5.74. Summary statistics are presented in Table 1. The mean ratings per speaker of the two groups showed a significant Pearson’s correlation ($r = 0.85$ $p = 0.001$). A t -test performed on these ratings also shows no difference in means between the two groups ($t = -0.85$,

Table 1
Summary statistics for comprehensibility.

	Mean	Standard Deviation	Minimum	Maximum
Content Faculty	5.627	1.933	2	9
EAP Instructors	5.743	1.591	2	9

$p = 0.41$). Fig. 1 shows mean comprehensibility ratings for each speaker, ordered from lowest to highest average scores. Error bars represent standard error.

5.2. Intelligibility scores

A lack of significant Pearson correlations between intelligibility scores and transcription utterance length (total word count, content word count, and duration in seconds) suggested that differences in length did not affect transcription accuracy.

On a scale of 0–1 (representing percent of words correctly transcribed), the mean intelligibility score from Content Faculty was 0.83, while the mean intelligibility score from EAP Instructors was 0.86. Summary statistics are presented in Table 2. Both groups apparently found the speakers similarly intelligible, since their scores per speaker show a significant correlation ($r = 0.94$, $p < 0.0001$). A t -test performed on these ratings also shows no difference in means between the two groups ($t = -0.99$, $p = 0.32$).

Fig. 2 shows mean intelligibility scores for each speaker, ordered from lowest to highest average scores. Error bars represent standard error. Average intelligibility scores (over both groups) were used to determine which three speakers were most intelligible (speakers 3, 4, and 6) and which speakers were least intelligible (speakers 8, 9, and 10). Speakers were then divided into three groups: high, medium, and low intelligibility. These intelligibility groups were used in several subsequent analyses.

5.3. Attitude and experience results

Among Content Faculty participants, many responses to attitude questions were strongly positive or negative, indicating that participants in this study had strong opinions about working with international students. Responses to several open-ended text-entry questions were coded as positive, neutral, or negative by two researchers. Results were compared and differences discussed and resolved. Among 23 Content Faculty participants, 7 were found to have positive attitudes, 7 were coded as neutral, and 9 were coded as negative (see example responses in Table 3). Among EAP instructor participants, attitudes were much less distinct. Since they could not be grouped into positive and negative attitude groups, all EAP Instructor participants' attitude was coded simply as "EAP."

Among Content Faculty ($n = 23$), 12 participants were found to have low experience and 11 were found to have high experience. Among EAP Instructors ($n = 21$), 9 were found to have high experience and 7 were found to have low experience. Another 5 EAP instructor participants with a level of experience that was unclear or fell in between the high and low groups were removed from analysis. See example responses in Table 4.

5.4. Relationships between comprehensibility, intelligibility, attitudes, and experience

In order to more closely examine the relationships between the multiple variables examined in this study, we performed linear mixed-effects model analysis in the lme4 package (Bates, Maechler, Bolker, & Walker, 2014) in R (R Development Core Team, 2014). These models have been shown to be more well-suited to this type of data than ANOVA and are able to account for random item and subject effects in a single analysis (Jaeger, 2008). Significance of each predictor was analyzed using model comparisons. All models included the maximal random effect structure that would allow the models to converge and included random intercepts for participants and for items. All continuous variables were scaled and centered. Separate models examined comprehensibility and intelligibility.

The full model for comprehensibility ratings included fixed effects for listener group (EAP Instructor vs. Content Faculty), intelligibility score, listener experience (high, medium, low), attitudes (positive, neutral, and negative for Content Faculty; EAP Instructor attitudes coded simply as EAP), and all of their interactions. Factors which significantly improve model fit included attitude ($\chi^2 = 12.383$, $p = 0.002$), intelligibility ($\chi^2 = 6.699$, $p = 0.01$), listener experience ($\chi^2 = 5.646$, $p = 0.02$), and the interaction between intelligibility and listener group ($\chi^2 = 3.987$, $p = 0.045$). Listener group did not emerge as a significant predictor of model fit ($\chi^2 = 0.038$, $p = 0.8$), and none of the other interactions were significant (all $ps > 0.2$). A summary of the best fitting model is presented in Table 5.

The results of this mixed-effects model analysis suggest that listeners who have more negative attitudes toward EAP learners also find non-native speech to be less comprehensible than listeners with more positive attitudes. Speakers who are found less intelligible are also perceived as less comprehensible than their more intelligible counterparts, and this is particularly true when Content Faculty are the listeners (see the interaction between listener group and intelligibility). Finally,

Mean comprehensibility ratings for each speaker

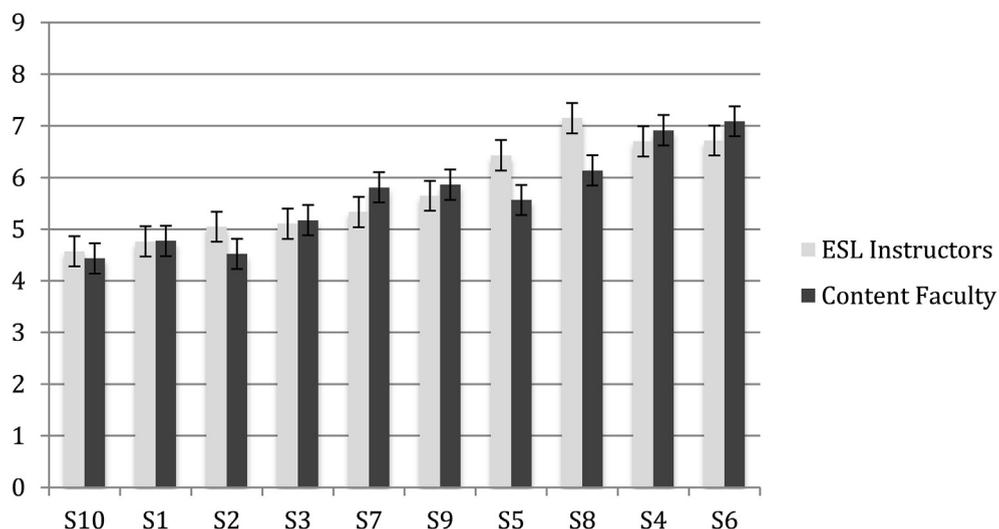


Fig. 1. Mean comprehensibility ratings for each speaker, from least to most comprehensible.

Table 2

Summary statistics for intelligibility.

	Mean	Standard Deviation	Minimum	Maximum
Content Faculty	0.834	0.239	0	1
EAP Instructors	0.862	0.253	0	1

Mean intelligibility scores for each speaker

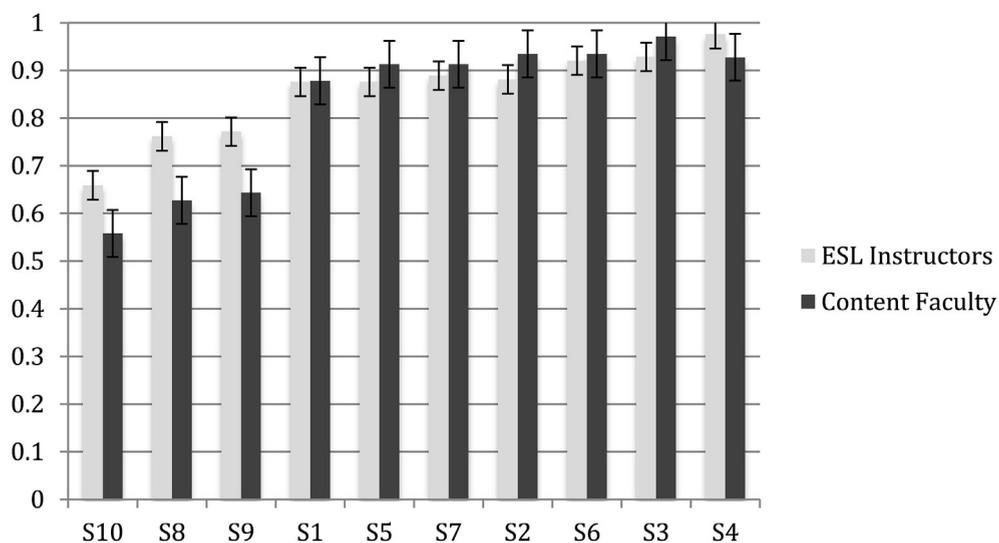


Fig. 2. Mean intelligibility scores for each speaker from least to most intelligible.

listeners with less experience with non-native speech perceive speakers to be less comprehensible than listeners with more experience.

The full model for intelligibility scores included fixed effects for listener group (EAP Instructor vs. Content Faculty), comprehensibility score, intelligibility group (low, medium, high), listener experience (high, medium, low), attitudes (positive, neutral, and negative for Content Faculty; EAP Instructor attitudes coded simply as EAP), and all of their interactions.

Table 3
Sample Attitude data.

Question: Attitude coding:	In your opinion, would the students you just heard be able to participate successfully in your courses?	Do most international students you encounter in your courses have good enough English language skills to succeed in those courses?	Is there anything else you would like to add?
Positive	yes	"Most" yes ... There are some that require extra tutorial guidance, particularly with formal academic writing.	An interesting survey! (Though rather long.)
Neutral	Most of the students could participate provided that they could understand me and the GTFs.	Yes - my undergraduate courses are technical in nature and do not require strong English speaking/writing skills.	Speaking pace is a catch-22 for international students. When they speak quickly, they are harder to understand. But when they speak slowly, others lose interest in paying attention. Either way, their thoughts often get passed over.
Negative	Most would not. I find that this is not just a communication problem, though that is the foundational problem. But the language problems contribute to a reduced ability to critically analyze complex issues and/or express a critical analysis.	No, I do not believe that they have adequate command of the language.	I think that the university does a disservice to international students by admitting them without appropriate skills. Further I think it diminishes the learning experience of English speaking students who have to do group and project work with ill-equipped students.

Table 4
Sample experience data.

	Group 1 subjects		Group 2 subjects	
	Number of international students in an average term/ contexts of communication	Other significant experience	Frequency/levels of oral skills instruction	Other significant experience
High Experience	More than 50 students/class discussions, presentations, office hours, and conversations between students.	My PhD advisor and some of my closest friends from graduate school are non-native English speakers.	6 terms teaching oral skills in the last two years/levels 4, 5, and 6.	12 years living abroad; over 20 years teaching EAP
Low Experience	1-10 students/class discussions, office hours.	No.	3 terms teaching oral skills in the last two years/levels 3 and 6.	No.

Table 5
Summary of best fitting model for comprehensibility data.

Factor	Estimate (β)	Standard Error (β)	t
Intercept	6.6979	0.5723	11.703
Group	-0.2131	0.6853	-0.311
Intelligibility	-0.6002	0.4556	-1.318
Attitude (Negative)	-1.7854	0.5543	-3.221
Attitude (Neutral)	-0.4863	0.5621	-0.865
Listener Experience (Intermediate)	-0.3557	0.5663	-0.628
Listener Experience (Low)	-0.8314	0.3426	-2.427
Group * Intelligibility	1.1377	0.5644	2.016

Table 6
Summary of best fitting model for intelligibility data.

Factor	Estimate (β)	Standard Error (β)	t
Intercept	0.9395	0.0416	22.579
Talker Intelligibility Group (Intermediate)	-0.0589	0.0339	-1.735
Talker Intelligibility Group (Low)	-0.1885	0.0368	-5.126
Group	0.005	0.0534	0.094
Group * Talker Intelligibility Group (Intermediate)	0.0261	0.0377	0.691
Group * Talker Intelligibility Group (Low)	-0.1447	0.0408	-3.554

Factors which significantly improve model fit included intelligibility group ($\chi^2 = 25.369$, $p < 0.001$) and the interaction between intelligibility group and listener group ($\chi^2 = 21.202$, $p < 0.001$). No other factors or their interactions emerged as significant predictors of model fit (all $ps > 0.2$). The summary of the best fitting model is presented below in [Table 6](#).

The results of this mixed-effect model analysis suggest that very few of the factors we examined here influence intelligibility overall. The interaction between listener group and intelligibility group is significant. Since EAP Instructors had higher

intelligibility scores than Content Faculty for the three speakers perceived as least intelligible (see Fig. 2), this result indicates that Content Faculty found lower intelligibility speakers to be significantly less intelligible than the EAP Instructors. This difference is not seen for the medium or high intelligibility listeners. That is, the difference between the two listener groups only emerges for the lowest intelligibility speakers.

6. Discussion

6.1. Research question 1: do EAP instructors and content faculty have different impressions of how easy it is to understand international student speech? (comprehensibility question)

Comprehensibility ratings given by Content Faculty and EAP Instructors were not significantly different. Since university EAP Instructors prepare students to communicate with Content Faculty (among others) upon completion of IEP programs, this indication that the two groups of instructors may judge comprehensibility by similar standards could be taken as an encouraging sign that the standards used by university EAP teachers are appropriate given the interlocutors with whom they are preparing students to speak.

One might have expected that higher comprehensibility ratings would be found from EAP Instructors, since their experience with language students and knowledge of the language learning process would allow them to predict and take into account specific differences in L2 speech. Participants in the EAP instructor group can be assumed to have significant knowledge of the language learning process, since all had master's degrees or higher in TESOL or applied linguistics. However, it was experience rather than participant group that significantly improved model fit for comprehensibility ratings. Since levels of experience with non-native English were coded only within groups, this result indicates that having more experience than others listeners in similar positions related to higher comprehensibility ratings. More research is needed to determine how familiarity with non-native speech in general interacts with positive evaluations of comprehensibility.

Attitude was found to significantly improve model fit for comprehensibility. EAP Instructors did not display distinct differences in attitude, so this factor was analyzed only for Content Faculty. Content Faculty who indicated negative attitudes towards the language skills of international students tended to rate them as less comprehensible than Content Faculty who showed more positive attitudes. That participants who believe students have poor skills would also rate them more poorly on a comprehensibility scale is not surprising: impressions of others both influence and arise from attitudes towards them. The more interesting result is that attitude did not significantly improve model fit for intelligibility. In other words, the faculty members whose ratings of both attitude and perceived comprehensibility were negative could transcribe excerpts from the same speeches with equivalent accuracy to other faculty groups. They actually understood just as many words, even as they reported that the speech was harder to understand. This finding is in alignment with results from Lindeman (2002) and Kang and Rubin (2009) showing that listener attitudes affect perceived success of communication more than they affect listeners' actual ability to understand.

6.2. Research question 2: do EAP instructors and content faculty differ in their actual ability to understand international student speech? (intelligibility question)

Overall, there was no significant difference in transcription accuracy between Content Faculty and EAP Instructors; the two groups were equally able to transcribe content words from these students' speech. This result differs from previously published results (Kang & Rubin, 2009; Kennedy & Trofimovich, 2008) finding higher transcription accuracy from EAP Instructors. In the current study, however, differences between listener groups emerged only in interaction with differences between intelligibility groups: EAP Instructors transcribed significantly more accurately than Content Faculty when speakers were judged less intelligible overall. It is possible that EAP Instructors' specific TESOL training and EAP teaching experience helped them better understand the more challenging passages, while the more intelligible students were easy enough to understand without this special training. This possible ceiling effect on intelligibility may also explain the difference from previously reported results.

6.3. Implications

These results have several implications for international student education in light of the challenges mentioned in the introduction. Since the speech samples used in this study came from a class at the highest level of the IEP, the students recorded were able to continue on to university study with only a few more weeks of language instruction after these recordings were made. Their language skill is therefore reasonably representative of some international students beginning their university studies. Both EAP Instructors and Content Faculty found the comprehensibility of these speech samples to be, on average, slightly better than "completely comprehensible, given significant special effort." They were also able to transcribe, on average, 86% of the content words after listening to a sentence one time. At the same time, comments typed in by some Content Faculty in this survey indicated that the international students speech samples were often considered to show inadequate spoken language skills for university study, and faculty surveys such as Evans (2014) indicate that many professors believe international students' language proficiency level causes problems in their courses.

What does it mean that some faculty members find international students to be relatively comprehensible and intelligible as described above, yet still say their spoken language ability is insufficient? It is possible that Content Faculty do not have the

time and attention available to make the “significant special effort” that (in their own view) would allow them to understand the average international student. It is also possible that, although faculty can indeed understand students, they find the students’ English proficiency level to be inadequate for other reasons, such as generalizations from experiences with other students or from other language skills such as writing, or simply that they generalize from the least comprehensible and intelligible students when they talk about their dissatisfaction with the language skills of international students in general.

It was especially interesting to note that faculty members with negative responses to attitude questions (those who feel these students have inadequate language proficiency) judged the students to be less comprehensible, even as they were able to understand the actual words spoken to the same degree as other faculty. This situation might be mitigated through training for Content Faculty that focuses on attitudes toward different language varieties, familiarity with specific common varieties, and strategies for improving communication (see [Subtirelu & Lindemann, 2014](#)), as well as awareness of the degree to which they indeed can indeed comprehend the speech of international students.

7. Conclusions

This study is a comparison of the perceptions of two audiences important to international student speakers: the IEP teachers who are preparing the students for academic interactions, and the content faculty that will interact with the students in university courses. The phenomenon under investigation was the perceptions of these two groups, rather than the spoken production of the international students.

The two participant groups were found to be quite similar in their perceptions of international student speech, a potentially encouraging result for international student education, since it indicates that both groups can make evaluations using similar standards and should be able to communicate about students’ needs. Differences were found between how the two groups of listeners responded to students who were perceived to be less intelligible (EAP Instructors could transcribe more accurately for less intelligible speakers), and in judgments of comprehensibility among Content Faculty on the basis of reported attitudes (faculty with negative attitudes towards the language ability of current international students rated speech as less comprehensible, even though their ability to transcribe accurately was not statistically different).

Since challenges with comprehensibility and intelligibility can reduce international students’ academic confidence and reduce opportunities for everyone at the university to benefit from the cultural and content area knowledge of international students, it is important to understand how international students and their listeners succeed and fail to understand each other. This study can help university faculty recognize which factors affect their ability to understand students, and it can help guide the priorities of IEP instructors as they prepare international students for study in US universities.

Appendix 1

Table A

Details on speakers and full speeches.

ID	L1	Gender	Time
S1	Chinese	Male	1:33
S2	Japanese	Female	1:57
S3	Chinese	Male	1:17
S4	Spanish	Male	2:00
S5	Japanese	Female	1:18
S6	Chinese	Female	1:12
S7	Chinese	Male	1:26
S8	Arabic	Male	1:11
S9	Arabic	Male	1:21
S10	Korean	Male	1:15

Table B

Details on intelligibility excerpts.

ID	Sentence	Content words	Time in Seconds
S1	We can get any other energy to instead of it	CAN GET OTHER ENERGY INSTEAD	4
S2	The most important quality of good person are manner	MOST IMPORTANT QUALITY GOOD PERSON MANNER	9
S3	People they don't have realize to protect the environment.	PEOPLE DON'T HAVE REALIZE PROTECT ENVIRONMENT	6
S4	We don't have too much options regarding that point.	DON'T HAVE TOO-MUCH OPTIONS REGARDING POINT	5
S5	For a part of people the world doesn't change.	PART PEOPLE WORLD DOESN'T CHANGE	5
S6	The government can make some advertisement to help the society.	GOVERNMENT CAN MAKE ADVERTISEMENT HELP SOCIETY	8
S7	There are three reasons; the first reason is pollution.	THERE THREE REASONS FIRST REASON POLLUTION	4
S8	I don't have exact special goal to achieve in my life, but.	DON'T HAVE EXACT SPECIAL GOAL ACHIEVE LIFE	3
S9	They should be banned from city the cars.	SHOULD BE BANNED CITY CARS	4
S10	Parents have lots of experience than their childrens.	PARENTS HAVE LOTS EXPERIENCE THAN CHILDREN	4

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