

## Intelligibility of Slowed Speech in Indian English

Tomoyuki KAWASHIMA

*Gunma University*

### Abstract

Over the past few decades, a small number of studies have reported a limited advantage of a reduced speech rate on the intelligibility of English to non-native listeners. However, this finding seems inconsistent with teachers' common assumptions based on their language learning and teaching experiences. To review this finding and accumulate research evidence that involves Japanese participants, the researcher conducted an experiment with 51 non-English-major college students. Two dialogues between an Indian and a Japanese speaker were played three times at the original speech rate, and at a 20% reduced speed nine weeks later. The intelligibility of Indian English (IndE) was measured by transcription and open-ended questions. A two-way analysis of variance indicated that transcription rate improved significantly at the reduced speech rate, but the increase in the number of correct answers to comprehension questions did not reach the significance level. The results partially confirmed the accuracy of the findings in the literature. Despite its inconclusive results, this research contributes to the much-needed exploration of the underexplored research area of the intelligibility of non-native speaker (NNS) English to Japanese listeners, and the findings have important implications for teaching listening comprehension of NNS English in Japan.

**Keywords:** intelligibility, Indian English, speech rate, transcription, comprehension question

### 1. Introduction

Japanese learners of English today have more chances to speak English with non-native speakers (NNSs), especially those from Asia. The Japan National Tourism Organization (JNTO, 2017) recently reported that the number of tourists visiting Japan increased five times in the past 17 years and the steady rise continues to this day. Asian English speakers are dominant business partners as well. According to an annual survey through which the Japan External Trade Organization (JETRO, 2017) collected responses from 2,168 companies, more Japanese companies had their branch offices in China (56.2%) and in Thailand (35.2%) than in the USA (30.0%). There is a pressing need to familiarize Japanese learners with non-native speaker (NNS) English. However, audio recordings currently used in classroom do not address this need of exposure to NNS English. There are only a handful of college English textbooks with CDs/DVDs of NNS English. Online materials are not always suitable to ordinary Japanese students.

For instance, news programs cannot be used without teachers' efforts to make the materials more approachable. High school students in Japan have even fewer chances to listen to NNS English in the classroom. Kawashima (2018) found from the results of a questionnaire survey of 15 textbook publishers that 92.8% of all the speakers on the audio CDs for high school textbooks were from North America and Britain. Only two publishers used Australian speakers, and only three publishers had NNSs from Japan and Israel read their textbooks.

Under these circumstances, the development of appropriate materials to teach listening comprehension for NNS English is long awaited. However, care should be taken in their use with high school and college students, for they are accustomed to hearing "standard" English spoken by professional voice actors and actresses from North America. Teachers should have a step-by-step approach to teaching listening comprehension so as not to overwhelm students with unfamiliar English accents. One such step-by-step approach involves reducing the speech rate.

A review of the literature on intelligibility indicates mixed effects of a reduced speech rate on listening comprehension. The technical term "intelligibility" used in this paper was defined by Derwing and Munro (1997) as the ability to transcribe the actual words of an utterance and understand its meaning. It is argued that the lowered speech rate may contribute to higher intelligibility only through interaction with other factors such as the strength of accents (Matsuura, Chiba, Mahoney, & Rilling, 2014) and the length of pauses (Sugai, Yamane, & Kanzaki, 2016).

Indeed, intelligibility is a complex phenomenon and researchers have examined many factors that are likely to influence intelligibility of speech. For instance, factors pertaining to speakers include degree of accentedness (Kelly, 1991) and lexical stress, and factors pertaining to listeners include attitudes and familiarity with the accent. There are also other factors stemming from the type of input, e.g., whether it is monologic or dialogic communication, and the nature of text, in other words, whether speech is scripted or unscripted. Moreover, the recent development of the English as a Lingua Franca paradigm has encouraged researchers to view intelligibility as a two-way process based on the mutual efforts made by speakers and listeners.

Besides the variation in the factors related to participants and stimuli, inconsistent research methods may have led to mixed research findings about intelligibility. Kawashima (2017) speculated that the inconclusive results were partly due to a lack of consistency in methodology. For instance, two types of intelligibility were examined in previous research. Some researchers used scalar ratings to examine perceived intelligibility or to measure how difficult participants felt it was to comprehend the speech. Others adopted transcription or dictation tasks as a test of actual intelligibility and examined how much participants were able to understand. Still others gave multiple choice questions or open-ended questions to measure another aspect of actual intelligibility.

While keeping in mind that all the factors discussed above can contribute to the intelligibility of speech, this study focuses on the speech rate. Teachers tend to believe from their own language learning and teaching experiences that controlling the rate of speech production will enhance the intelligibility of speech. In fact, some practice textbooks intended to prepare high school students for the National Center Test for University Admissions have audio files recorded at multiple speech rates.

Furthermore, there is a serious paucity of intelligibility research involving NNSs as speakers and listeners. This research project was designed to shed more light on the inconclusive relationship between a reduced speech rate and the intelligibility of NNS speech and to accumulate evidence indispensable for the development of teaching materials and methodologies. The project consisted of a pilot study and a main study that employed identical stimuli of Indian English (IndE) and test formats. In this paper, the researcher reports specifically on the main study. However, some results of analysis of the data in the pilot study are also presented. One large difference between the pilot and main studies was the existence of a control group in the main study to allow a more rigorous statistical analysis. Another minor difference was made to the proficiency test given before the pretest. In so doing, answers to the following research questions were sought:

Q1 How intelligible is IndE to Japanese university students?

Q2 Does a reduced speech rate contribute to higher intelligibility?

Q3 How do proficiency levels influence intelligibility?

## **2. Literature Review**

### **2.1 Intelligibility of NNS English to Japanese Listeners**

This section reviews the evidence regarding the intelligibility of NNS speech to Japanese ears. A total of eight research studies, which were all those available to the best of the researcher's knowledge, were annotated jointly according to their focus of research.

The first group of studies reported the advantage of Japanese listeners in understanding the speech made by Japanese speakers of English. Hemmi (2010) found that Japanese listeners found the English of Japanese speakers to be more intelligible than that of a NS of British English. Hemmi chose five speakers from speakers at past Davos Conferences on the basis of impressionistic judgment. Unlike Hemmi's study, where perceived intelligibility was examined, Munro, Derwing, and Morton (2006) examined the actual intelligibility of the Japanese English (JapE) accent. The speakers were selected from college students enrolled in high- and intermediate-level ESL classes in Canada through their subjective judgment of the strength of foreign accents. Their findings showed that Japanese listeners were able to transcribe the speech made by Japanese more correctly than the other speaker groups. Smith (1992) showed that intelligibility can vary depending on how we measure it. After listening to speech in JapE, all 10

Japanese listeners in his study were able to answer 60% or more of the cloze test items correctly. However, fewer Japanese listeners, eight out of 10 participants, were able to answer 60% or more of the multiple-choice questions correctly, and even fewer Japanese, only four participants, were able to paraphrase the speech in JapE correctly at least 60% of the time. Smith attempted to minimize the effects of extraneous factors by regulating the number of embedded sentences in speech, as well as the setting and topic of speech. However, the selection of the seven NNSs, including one Japanese, seems to have relied on subjective judgment.

The research in the second group presented conflicting results. It is documented in Kelly (1991) that Japanese listeners found a NS of American English (AmE) more intelligible than a JapE speaker. Although the selection process of the two speakers was not described, Kelly regulated the speech rate by counting the number of syllables per second. Major, Fitzmaurice, Bunta, and Balasubramanian (2002) examined the intelligibility of AmE and NNS accents by Chinese, Japanese, and Spanish speakers. Japanese listeners did not perform significantly differently on multiple-choice questions about the lectures delivered by Japanese speakers. Major et al. assessed the degree of foreign accents impressionistically and also asked 76 NS university students in the US to rate the speakers' accents. Still another study, by Matsuura (2007), presented the surprising finding that Japanese listeners found it easier to understand a speaker of Hong Kong English than a NS of AmE. The selection process of the two speakers involved scalar rating and a subjective judgment of the speech rate and articulation.

The remaining two research studies reported poor intelligibility of IndE. Japanese listeners were able to answer multiple-choice questions more successfully when the speech was made in standard AmE or Southern American English than when it was made by an IndE speaker (Major, Fitzmaurice, Bunta, & Balasubramanian, 2005). Matsuura et al. (2014) conducted two experiments where a total of 179 Japanese listeners evaluated the intelligibility of speech made by one NS of Canadian English and four NNSs from India, Ghana, Kenya, and Sri Lanka. The findings showed that Japanese listeners found IndE least intelligible.

## **2.2 Why Indian English?**

IndE was chosen in this research for the following three reasons. The first was to review the findings by Matsuura et al. (2014), which used IndE as a stimulus. This study was not a replication study in a strict sense, for it did not repeat their study using the same methodologies. However, their research was one of the very few studies involving IndE. Second, IndE accents have distinctive phonological characteristics. Enokizono (2000) maintained that one of the characteristics of IndE is “spelling pronunciation” or a way of pronouncing words as they are spelled. For instance, the letters *d* and *g* are often pronounced in the words ‘Wednesday’ and ‘sign’. However, it is also important to acknowledge that

IndE has varieties.

The third reason is the need for greater familiarity with IndE among the Japanese population owing to recent close contacts with Indians. Popular newspapers in Japan reported that trade between India and Japan increased after the turn of the millennium and that the two countries are now directly connected by daily flights (The Asahi Shimbun, 2008; The Yomiuri Shimbun, 2007). Indian restaurants have sprouted up even in small towns in Japan and two Indian international schools were opened for Indian children living in Tokyo in the early 2000s. The newspapers further reported that some Japanese sent their children to the Indian international schools for primary education. An article in the *Yomiuri Shimbun* (The Yomiuri Shimbun, 2010) reported that three Indian schools in Tokyo are quite popular among the Japanese and that at one school, founded in 2003, 80% of the students are Japanese. According to the press release by the Embassy of Japan in India, the number of Japanese companies with branches in India jumped nearly five times from 267 companies in 2006 to 1,305 companies in 2016 (Embassy of Japan in India, 2017).

### **2.3 Intelligibility of Indian English**

The literature suggests that IndE is often considered more difficult to understand than other NNS English accents. For instance, Prator (1991), based on 20 years of experience testing the English of incoming foreign students at the University of California, claimed that the most unintelligible educated variety was IndE. This difficulty is likely to stem from unique characteristics of IndE in terms of stress, intonation, rhythm, and phrasing. Languages can be divided into those with stress timing and those with syllable timing. All the main South Asian languages are syllable-timed languages (Kachru, 1969, cited in Nelson, 1982, p. 65), and many NNS accents reflect a syllable-timed rhythm (Nihalani, 2000, p. 109), whereas most native English accents show a stress-timed rhythm. In a stress-timed language, syllables last different amounts of time, but there is perceived to be a fairly constant amount of time between stressed syllables. On the other hand, in a syllable-timed language, every syllable has roughly the same duration (Brown, 1989; Major et al., 2002).

It is also important to note that IndE is not a single accent. Using three Indian teaching assistants with different L1s (Bengali, Tamil, and Hindu-Urdu), Pickering and Wiltshire (2000) investigated the effect of different first languages on the production of IndE. The similarity of the results for the three different L1 suggested that the phonetic correlates of accent in IndE are common to speakers of these three Indian languages. Nevertheless, they argued for the importance of acknowledging that there are many IndE accents, even though points of commonality are found across different types of IndE. As 2001 Census data showed, India had at least 100 non-scheduled languages in addition to the 22 scheduled languages whose development is guaranteed by the Indian Constitution (Government of India, 2001). Especially noteworthy is the fact that these

languages belong to several different language families. Therefore, even though Pickering and Wiltshire (2000) found some phonetic features common to IndE spoken by native speakers (NSs) of these three Indian languages, it is still plausible to expect a variety in the IndE accent.

### **3. Methods**

#### **3.1 Research Design and Timeline**

This experiment was conducted as a listening activity in a 15-week general English course. The study employed a pre- and post-test design. However, no treatment was given between the pretest and the post-test. To strengthen the evidence obtained, an experimental design with a control group was used.

Data collection was performed in the following timeline. A proficiency test was given in Week 1 and the first listening tasks were performed in Weeks 2 and 3. Indian speech at the original speed was played three times. After an interval of nine weeks, the second listening tasks were given in Weeks 11 and 12. Participants in the Experimental Group listened to the identical Indian speech at a reduced speech rate three times, while the Control Group listened to the speech at a normal speech rate. Care was taken to minimize the practice effect on memory when choosing the methods to measure intelligibility and setting the length of the time interval between the two data collections. For the listening activity in the remaining weeks, students watched videos of World Heritage sites narrated by a NS of AmE.

#### **3.2 Participants**

The study was conducted in two classes of 2nd-year students majoring in health sciences from October to December 2017. The Experimental Group had 28 students and the Control Group had 23 students. Data of participants who did not consent to participate in the study or who did not complete five data collections were excluded from analysis. The average TOEIC score for the 158 students in the same department was 438. The average TOEIC scores of only the participants in the study were not available. However, the researcher taught English to all the students in the department and perceived no marked difference in their English proficiency levels between the sample and the remaining students. To examine if English proficiency levels had any effect on transcription and comprehension rates, participants were further divided into two proficiency groups on the basis of the scores of an English proficiency test. The Experimental Group had 13 high proficiency students and 15 low proficiency students. Likewise, there were 12 high proficiency students and 11 low proficiency students in the Control Group.

The preliminary study took place from November 2016 to January 2017. Thirty-six 2nd-year students specializing in health sciences participated. The mean TOEIC score of 155 students in the same department with this sample group was 429.

### 3.3 Indian English for Experiments

The stimuli of IndE for the experiment were adopted from Enokizono (2012), a book published primarily for Japanese businessmen planning to work in India. The book contains conversations between a Japanese businessman named Ari and the Indian people he would meet in India. On the accompanying CD, the lines of Ari were read by a male NS of North American English, and all the other lines of Indian interactants were read by five IndE speakers. No explanation was provided in the book concerning the strength of the speakers' L1 accents. The researcher judged the English of one speaker to be moderately accented and the easiest to understand based on his subjective judgment.

From the dialogues in which this specific Indian speaker participated, two dialogues were then selected. One was a conversation between Ari and an Indian clerk at an information counter at the airport (Enokizono, 2012, pp. 33–34). Ari asked for information about the transportation from the airport to the hotel. The other dialogue was held between Ari and a hotel clerk (Enokizono, 2012, pp. 60–61). They talked about the transportation from the hotel to a town that Ari wished to visit for a business appointment. The lines of the Indian clerks in the two dialogues were read by the same male Indian speaker. These two dialogues were chosen for two reasons. First, each dialogue had four lines to transcribe. Each line had at least seven words and all the words were entry words specified as important for junior and/or senior high school students in English-Japanese dictionaries commonly used in Japan. Second, it was possible to make four comprehension questions based almost exclusively on the lines read by the Indian speaker.

In Dialogue 1, Ari's lines had 76 words in total and his part lasted 26 seconds, meaning that the AmE-speaking voice actor playing Ari spoke at a rate of 175.4 words per minute. On the other hand, the Indian clerk at the airport spoke 144 words in 42 seconds, meaning that the speed of IndE was 205.7 words per minute (WPM). This brief summary of Dialogue 1 shows that the IndE speaker not only spoke nearly twice as long as the speaker of AmE, but he also spoke much faster. Matsuura (2007) reported the speech rates of the two speakers used in her study as follows: 169.5 WPM for a NS of AmE and 142.7 WPM for a NNS of English with a Cantonese accent. Due to the various limitations involved in the selection of the speech stimuli, the gap in speech rate between AmE and IndE speakers was not controlled.

A beeping sound was inserted before the line to be transcribed to attract listeners' attention. Moreover, a pause long enough for transcription was added after the line. Free online software, Audacity, was used for editing. To reproduce the dialogue at a 20% reduced speed, the function of "change tempo" was selected from the effect menu, which allows the tempo to be changed without affecting the pitch or frequency range.

### **3.4 English Proficiency Test**

The pilot study helped improve the English proficiency test used in the main study. Originally, 20 listening questions in the multiple-choice format adopted from STEP Eiken 2nd-Grade test were used for this test. However, the preliminary analysis in the pilot test revealed a very low correlation between the English proficiency test scores and the transcription and comprehension rates for IndE. The correlations were .16 with the transcription rate and .12 with the comprehension rate. The fact that the relationship was so small as to be negligible cast doubt on validity of the English proficiency test, suggesting that the scores did not discriminate well between high proficiency and low proficiency students. The researcher speculated that this was caused by the unsuitable difficulty level of the listening test. In the main study, the number of questions adopted from STEP Eiken 2nd Grade was reduced to 10, and 10 questions for Pre-2nd Grade were added. The decision was made to balance the biased distribution of the test scores toward the lower range in the piloting. Owing to the change in test items, the STEP scores of the Experimental Group showed a moderate correlation with the transcription rate (.67) and with the comprehension question scores (.56).

In addition, a transcription task was added to the multiple-choice questions. Participants listened three times to two sentences excerpted from a dialogue for STEP Eiken 2nd Grade in which two people talking to each other spoke two lines each. Participants transcribed the second line of one of the speakers: “But remember, people are usually nicer than they first seem” (10 words) and “so I’ll get someone else to help with the meeting preparation” (11 words). These lines were read by a NS of “standard” AmE. The transcription task was included in the proficiency test because of the need to compare the transcription rate of IndE with that of typical North American English as used in listening comprehension tests. Without objective criteria, it was impossible to compare the levels of difficulty for listening comprehension. Furthermore, it would be hard to generalize the findings.

### **3.5 Measurement of Intelligibility**

Transcription and open-ended comprehension questions were used for data collection after due consideration. Multiple-choice questions and cloze tests are commonly used to examine actual intelligibility. However, they were not chosen in this study for fear of the high practice effect these types of tests could produce on participants. A multiple-choice question needs one question, one correct answer, and a few distractors. Likewise, a cloze test involves presenting listeners with a script with blanks. It was anticipated that the more information given in the pretest, the more participants might remember about the conversation when they took the test again. The reason why transcription tasks and open-ended comprehension questions were adopted was that only minimal information was required to answer such questions.

The answer sheet had a brief explanation of the situation of the



conversation. For instance, the instruction of Dialogue 1 went like this: At the airport a Japanese businessman, Ari, asks a clerk at the information desk about transportation to the city center of New Delhi. In addition, the first four lines between the two speakers were already written on the answer sheet to promote participants' understanding of the situation. Meanings of a few difficult words, e.g., *Metro*, *swindle*, and *auto rickshaw*, were provided on the sheet. The words in the lines containing answers to comprehension questions were deleted from the answer sheet (see Appendix).

Participants were instructed to transcribe 45 words in Dialogue 1 and 39 words in Dialogue 2. The length of phrases or sentences they had to transcribe at one time ranged from seven to 16 words. The number of syllables in one phrase or sentence fluctuated between eight and 20. Participants were instructed to transcribe four lines in the dialogue in the designated space of the answer sheet while listening to the dialogue three times. After listening, they were asked to answer four comprehension questions in their own words on the back of the sheet. An interval of nine weeks between tests was selected, such that participants listened to Dialogue 1 in Weeks 2 and 11 and Dialogue 2 in Weeks 3 and 12. Comprehension questions were not written on the answer sheet. Four questions in Japanese were instead read by the researcher. To answer based on what they understood, participants were not allowed to look at their transcription on the front of the page while answering the questions. The questions used in the survey, Questions 1 to 4 for Dialogue 1 and Questions 5 to 8 for Dialogue 2, are presented in Table 2 in the Results section.

### **3.6 Marking of Transcriptions**

A lenient scoring method was adopted in this research. The exact answer method was not selected because the task aimed to examine participants' listening comprehension. Words were judged correct as far as they were written in the same order as they were used in the dialogues. As regards spellings, answers were judged correct if it was possible to guess the words participants tried to answer. For instance, "curuture," "caluture," and "calture" were accepted for "culture." Answers that seemed far from the correct spellings, thus making easy association with the correct words impossible, were not accepted, e.g., "culcer." On the other hand, the strict scoring method was used to mark certain spellings that could affect the meaning. For instance, singular and plural forms were distinguished in nouns, and "cultures" with a plural "s" was marked incorrect. Moreover, errors in comparative forms such as "safe" for "safer" or homophones were not justified when the correct answers were specified as essential for junior high school students in English-Japanese dictionaries. The errors in the last category included "no" for "know," "buy" for "by," "our" for "hour," "there" for "their," and "hear" for "here." After the marking, the percentages of correctly transcribed words in proportion to the total were computed for the respective sentences.

### 3.7 Marking of Comprehension Questions

Depending on the amount of information included in the answer, scores were given to each answer. For instance, to the first question about Dialogue 1, “According to the staff, what is Connaught Palace Hotel like?”, the perfect answer was “It is (a) very big and (b) famous and (c) it is near the subway.” Three points were given if the three pieces of information were included. In total, seven points were assigned to the answers for Dialogue 1 and seven points for Dialogue 2. After the marking, the comprehension rate for each dialogue was calculated by dividing the points participants earned by 14, the sum of the points. Finally, the comprehension rate was indicated in percentages.

### 3.8 Data Analysis

To answer RQ1 “How intelligible is IndE to Japanese university students?”, two analyses based on transcribed words and answers to comprehension questions were conducted. First, to compute the transcription rate for IndE, the number of words correctly transcribed for the two dialogues were summed, and then the sum was divided by the total number of words participants had to transcribe (84 words). The transcription rate for AmE was also computed based on the number of correct words transcribed in the English proficiency test in Week 1. The other intelligibility index of IndE, comprehension rate, was obtained by computing the percentage of correct answers to the eight comprehension questions.

In response to RQ2 “Does a reduced speech rate contribute to higher intelligibility?”, a two-way analysis of variance (ANOVA) was conducted to compare the effect of the reduced speech rate on intelligibility. To explore RQ3 “How do proficiency levels influence the intelligibility?”, participants were divided into two groups. The mean score on the STEP test was 11.45. Participants scoring 12 or above were classified as the members of the High Proficiency Group and the remaining students formed the Low Proficiency Group. To examine the effect of the proficiency levels, separate repeated-measure ANOVAs were conducted on the STEP scores and either of the two intelligibility variables (the transcription rate and the comprehension rate).

## 4. Results

### 4.1 RQ1: Intelligibility of Indian English to Japanese University Students

**Transcription rate for IndE.** The transcription rate was 47.0%. This means Japanese university students were able to transcribe slightly less than half of the English words spoken with an Indian accent at the original speech rate.

**Transcription rate for AmE.** The transcription rate for AmE was 44.7% for all participants, 43.3% for the Experimental Group and 46.7% for the Control Group. The equivalent rate for IndE for all participants was 44.8%, 47.0% for the Experimental Group and 41.8% for the Control Group. When comparing the rate of correctly transcribed words to the total in AmE (44.7%) and in IndE (44.8%), it is very interesting that the transcription rate did not differ much between AmE

and IndE. This result indicates that the transcription rate was not much different between IndE and AmE. However, considering the fact that participants lacked familiarity with IndE, it might be difficult to conclude from this finding that IndE was as intelligible as AmE. A more plausible explanation for this unexpected finding is that the text used for the transcription of the speech with an AmE accent was too difficult. They were asked to transcribe two sentences: “But remember, people are usually nicer than they first seem” and “so I’ll get someone else to help with the meeting preparation.” Both sentences had ten or more words and included characteristic structures like a comparative expression and a “get somebody to do something” structure.

**Comprehension question scores.** Compared with the transcription rate, the comprehension rate was low. The average for the first test was 25.8% for the Experimental Group and 20.4% for the Control Group. It is vital to consider the reason why the comprehension rate was much lower than the transcription rate.

#### 4.2 RQ2: Effect of a Reduced Speech Rate on Intelligibility

**Transcription rate.** The transcription rate for the Experimental Group rose from 47.0% to 56.7%. The change for the Control Group was smaller, ranging between 41.8% and 45.9%. The transcription rate for each sentence is tabulated in Table 2. A two-way ANOVA revealed a significant interaction between the speech rate and group for the transcription rate,  $F(1, 49) = 8.03, p < .01$ .

Table 1  
*Summary of the Findings for Research Questions 1 and 2*

Analysis	Normal speech rate	Reduced speech rate
<u>Transcription</u>		
Transcription rate		
Experimental group	47.0%	56.7%**
Control group	41.8%	45.9%
Transcription AmE		
Experimental group	43.3%	
Control group	46.7%	
<u>Comprehension questions</u>		
Comprehension rate		
Experimental group	25.8%	36.8% n.s.
Control group	20.4%	27.8%

Note. \*\*  $p < .01$ , n.s. = no significance.

Table 2

*Transcription Rate for Each Sentence in the Pilot Study (%)*

No.	Sentence for transcription	Normal speech rate	Reduced speech rate
S1	Don't use any taxi waiting for free passengers.	55.2	65.3
S2	or they will bring you to hotels where they can get commissions if they bring guests.	19.8	28.2
S3	it is better and safer to hire a prepaid cab of famous companies	40.0	42.9
S4	Safety is most important at night in India.	40.7	47.2
S5	it is in a sense our culture	47.9	54.4
S6	They just don't know how to speak and behave.	66.3	81.4
S7	you will have to pay by the hour	70.6	78.6
S8	you don't have to worry about hiring a taxi there in Noida to return here	54.8	60.6

**Comprehension question scores.** Table 3 presents the comprehension rate for each question in the pilot study. The two-way ANOVA of the comprehension question scores in the main study did not show statistically significant interaction effects,  $F(1, 49) = 3.07, p > .05$ . In other words, the ANOVA did not confirm an effect of reduced speech rate on the comprehension rate. The conclusion we can draw from the findings is that a slowed speech contributed to a higher transcription rate but did not improve the comprehension rate.

#### 4.3 RQ3: Effects of English Proficiency Levels on Intelligibility

Table 4 indicates the average transcription and comprehension rates by speech rate and proficiency levels. The second transcription and comprehension rates of the Control Group are indicated in parentheses because they listened to IndE at normal speed at the two data collection points. The average transcription rate of the high proficiency students in the Experimental Group increased from 42.9% to 51.5%, while the average rate of their counterparts in the Control Group changed from 40.2% to 44.3%. A repeated-measures ANOVA of the proficiency scores and transcription rate was performed, yielding no significant effect of the proficiency. Another ANOVA of the proficiency scores and the comprehension rate was conducted, but the results revealed no significant difference in the comprehension rate by proficiency level.

Table 3

*Comprehension Rate for Each Question in the Pilot Study (%)*

No.	Comprehension question	Normal speech rate	Reduced speech rate
Q1	係員によると，コンノートパレスホテルはどんなホテルですか。	21.5	38.7
Q2	係員によると，ホテルまで地下鉄を使うとどれくらい時間がかかりますか。	54.8	61.3
Q3	係員によると，ホテルまで地下鉄を使うと途中で何回乗り換えが必要ですか。	19.4	54.8
Q4	係員が普通のタクシーではなく，プリペイドタクシーを勧める理由を，2つ答えなさい。	16.1	35.5
Q5	ホテルの従業員は，誰が何をすることがインドの文化だと言っていますか。	12.9	38.7
Q6	ホテルの従業員は，アリさんにどうすることを勧めましたか。	32.3	16.1
Q7	700 ルピーは何にかかのお金ですか。具体的に教えてください。	32.3	35.5
Q8	ホテルの従業員が，and what is more (さらに) の後に述べた理由は何ですか。	9.7	17.7

Table 4

*Summary of Findings for Research Question 3*

Analysis & proficiency	Normal speech rate	Reduced speech rate
<u>Transcription</u>		
Experimental group		
High proficiency	42.9%	51.5% n.s.
Low proficiency	36.5%	44.3%
Control group		
High proficiency	40.2%	(44.3%)
Low proficiency	29.6%	(32.3%)
<u>Comprehension questions</u>		
Experimental group		
High proficiency	32.5%	42.6% n.s.
Low proficiency	20.0%	31.8%
Control group		
High proficiency	26.3%	(34.0%)
Low proficiency	14.0%	(21.0%)

Note. n.s. = no significance.

## **5. Discussion**

### **5.1 Intelligibility of IndE and Effects of Proficiency Levels**

The primary aim of this study was to examine the effects of slowed speech in IndE on intelligibility. As discussed in Section 4.2, the number of words correctly transcribed improved significantly when the dialogues were played at a 20% reduced speech rate. However, the differences in the number of correct answers to the comprehension questions between the two speech rates were not significant. Statistically significant changes were not detected when the difference was analyzed with a two-way ANOVA. On the basis of these findings, we may well conclude that the lower speech rate promoted the transcription of the speech but did not contribute to better comprehension of the speech in IndE among Japanese university students.

Compared with the multiple-choice format, the difficulty of open-ended response formats has been reported (In'nami & Koizumi, 2009). So there remains a possibility that the lack of a significant difference in the comprehension rates may be due to the test format. Replication studies using a multiple-choice test format might allow us to gain a clearer picture of the relationship between reduced speech rates and intelligibility. With regard to the effects of English proficiency levels, there was no difference in the transcription rate or the comprehension rate by proficiency level.

### **5.2 Limitations**

This research has some limitations. First, the low comprehension rate may compromise the validity of the findings. The question types may be primarily responsible, but the possibility cannot be ruled out that the length of the sentences and lack of knowledge of customary practices in foreign countries may have caused the low comprehension rates. The length of the sentences that participants transcribed ranged from seven to 16 words, with an average of 10.5 words. The average transcription rate for three sentences longer than 13 words was 42%, in contrast to 64% for the remaining five shorter sentences. This suggests that the sentences were too long for participants to transcribe at one time. Lack of knowledge may have affected the comprehension of the dialogues as well. Kennedy and Trofimovich (2008) reported that listener experience and semantic information available contributed to the higher intelligibility of sentences spoken by L2 speakers. In this research, knowledge about the taxi system abroad is vital. Two types of taxis are often found at airports outside of Japan: officially registered airport taxis and unauthorized taxis. Furthermore, it is a common practice that some unauthorized taxis receive a kick-back or commission when they bring guests to certain hotels. However, most of the participants in this study were 19 or 20 years old and they lacked experience or knowledge about catching taxis in foreign countries. Therefore, the lack of familiarity with these common practices might have hampered their comprehension of the dialogues. In choosing the dialogues, the researcher paid great care to choosing dialogues where the

same Indian speaker read the lines, where four lines for transcription were found, and where four comprehension questions could be created mostly from the remaining lines of the Indian speaker. These conditions were prioritized, and the situation thus did not allow the researcher to address the need for semantic information.

Another shortcoming of this research is related to the treatment of listening stimuli. The gap in the two speakers' speech rates was not filled. Moreover, one of the characteristics of IndE is a weak sense of stress on words and rhythm in sentences (Enokizono, 2012, p. 13). These features may have been amplified when dialogues were reproduced at a reduced speech rate. Consequently, the stress or its lack on each word may have been exaggerated.

### **5.3 Implications for Teaching and Research**

The finding that a reduced speech rate contributed to higher transcription rates suggests the possibility of a step-by-step exposure to NNS English. Starting with slowed speech and moving to normal speech will be beneficial for Japanese learners of English who have been used to a very narrow range of English accents. The outcome of this research will be of great importance in reviewing the pedagogies and curricula in classrooms today so that they can help foster a "tolerance" in students for the variety of English accents currently in use all around the world.

To minimize the possible practice effect of repetitive research design, transcription and open-ended comprehension questions were adopted in this research. It is expected that replication studies will be carried out with different question types to examine the validity of these methods in measuring intelligibility. In addition, new methods should be developed to ensure a more objective measurement of the intelligibility of NNS English accents in comparison with NS English accents. Adding the transcription of speech by a NS of North American English to the English proficiency test would be a good starting point for future research. This researcher feels the need to improve these kinds of comparative methods to enable us to quantify the intelligibility of NNS English more objectively using the intelligibility of AmE as baseline data.

## **6. Conclusion**

This research project aimed to validate the finding that a reduced speech rate does not promote the intelligibility of IndE to Japanese listeners (Matsuura et al., 2014). The results partially verified the accuracy of their finding. The transcription rate rose markedly when the dialogues were reproduced 20% more slowly. However, the accuracy of responses to the comprehension questions did not vary significantly between the two speech rates. Despite its inconclusive findings, this research project contributes to the exploration of the underexplored research area of the intelligibility of NNS English to Japanese listeners. The accumulated evidence will serve as a basis for reviewing teaching methodologies

and creating materials to develop Japanese learners' listening comprehension of NNS English.

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37.

### Appendix

Answer Sheet for the Second Dialogue

ID

*A Japanese businessman, Ari, is making a complaint about the hotel clerk and the doorman at the front desk in India.*

Ari: Yes, it sounds good. Actually, they tried to force me to use expensive taxis.  
They are swindlers! swindler 詐欺師

Hotel Clerk: I know how you feel. (省略)(省略)(省略)

---

Ari: Do you mean the clerk and the doorman were right?

Hotel Clerk: I don't mean that.

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Incidentally, how long are you going to stay in Noida? Noida (町の名前)

Ari: In Noida, I will meet a customer of our company and give a gift from Japan.  
It'll take less than an hour.

Hotel Clerk: Then, (省略)

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(省略) (省略) (省略) and what is more,

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