Intelligibility Among Japanese EFL Learners: The Need for Pronunciation Practice

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The purpose of this study was twofold: to examine the intelligibility of Japanese university students' English pronunciation in terms of oral production features, and to utilize the findings as pronunciation instruction material in order to emphasize the importance of pronunciation among Japanese EFL students. For this purpose, a number of English consonants shown in the literature to be troublesome for Japanese learners was selected. A word list including these troublesome consonants was constructed and read aloud by Japanese university students. Average samples were extracted and evaluated in terms of intelligibility by native and nonnative speakers of English (excluding Japanese L1 speakers). The results highlight the need for pronunciation instruction in order for Japanese university students to attain an intelligible level of English pronunciation. The potential use of the present findings to raise awareness among EFL learners of the need for pronunciation practice is also considered.

　本研究は、日本語を母語とする大学1年生の英語発音の通用性の検証を通して、英語の発音指導の必要性を考察する。平均的な大学生の英語口頭コミュニケーションを収集し、彼らの英語の発音の国際通用性を単語レベルの発話で検証した。検証対象は、大学生が読み上げた英単語の音声である。検証法は英語母語話者、（日本語母語話者を除く）英語非母語話者による聞き取り度評価調査による。結果、英語母語話者、英語非母語話者の両者に対して通用性が低い単語の発音が認められた。また本研究より得られた知見を授業で活用することにより大学生の発音に対する意識を高める方途を探ることも研究の目的である。

THE ADVENT of globalization and the Internet have accelerated the already existing processes by which English has become a lingua franca for international communication. In this context, proficiency in English has become important for Japanese people in order to communicate with both native and nonnative speakers of English.

However, in actual English speaking situations, Japanese students frequently encounter difficulties with simple conversation. These speakers realize that the English ability they have attained, usually via formal instruction in school, is insufficient, difficult to apply in actual communication, or both. The causes of the ensuing communication breakdowns vary, but it is well known that a major issue in this regard is pronunciation, that is, the ability to produce English phonemes (the smallest units of speech) at an adequate level of proficiency.

Makino (2005) stated that it is easy to explain why Japanese students make mistakes in pronunciation: It is because they are not taught pronunciation adequately in English language education within the Japanese school system. Kosuge (2005) noted further that in English instruction at the

junior high school level in Japan, pronunciation is not given the same importance as grammar, vocabulary, or reading comprehension. Learners generally receive only a small amount of nonsystematic instruction regarding the English sounds /th/, /f/, /v/, /l/, and /r/ (Kosuge, 2005). As a result, the English of some Japanese speakers cannot be understood at all.

Even among professionals in related fields, varying opinions exist regarding the importance of pronunciation instruction for EFL learners. Some argue that pronunciation is not worth learning as it is a trivial aspect of overall communication. For instance, Torikai (2011) stated that there is no need for Japanese speakers to pronounce English /l/ and /r/ correctly as different sounds, as the interlocutor will infer what is meant from the content of the utterance. An opposing argument has been expressed by researchers such as Shizuka (2009), who claimed that pronunciation teaching is important, and indeed a fundamental aspect of English instruction, and that pronunciation is the basis upon which all other English skills are built.

Whereas Shizuka (2009) and other researchers have pointed out the lack of pronunciation instruction in Japanese EFL teaching, and identify this lack as a problem, some studies have suggested that pronunciation instruction has indeed been taking place more widely than previously realized. Recent survey results from the Japanese Ministry of Education, Culture, Science, Sports, and Technology (MEXT, 2013) have shown that many Japanese high school teachers claim to include pronunciation in their EFL instruction. Researchers have pointed out, however, that what EFL teachers call "pronunciation instruction" cannot reliably be regarded as such (Arimoto, 2005), because this instruction varies and many teachers are not well trained in this regard.

Of course, communication is not limited to verbal production, nor is it based solely on individual, unconnected words. EFL students' success in oral communication depends on their intelligible pronunciation of words. The question arises as to whether they will be understood if they express themselves in a word-by-word style of communication, using limited English vocabulary, with pronunciation influenced by Japanese. The questions that follow from this are whether such students are ready for international communication, and, if not, how they are to be instructed in order for their English to be intelligible.

In light of the above discussion, the aims of the research reported here were twofold. First, the word-level intelligibility of Japanese students' English was investigated. This intelligibility was evaluated by two groups, namely native English speakers (NSs), and nonnative English speakers (NNSs; excluding Japanese L1 speakers, Japanese L2 learners, and those with exposure to Japanese). Second, the findings regarding intelligibility were applied to teaching materials in pronunciation instruction in an EFL class at a Japanese university in an effort to raise learners' awareness of the importance of the pronunciation domain in EFL learning for actual communication so as to strengthen their ability to communicate competently.

Theoretical Background

Language instruction inherently implies communication as an essential goal. To this end, a number of researchers have debated the extent to which learners' English needs to conform to native-speaker norms. Shiozawa (2009) stated that the pedagogical goal for Japanese EFL learners should be to develop their English to an internationally intelligible level while still reflecting the features of educated Japanese English (a variety of English among many others). Kjellin stated that the goal for EFL should be "listener-friendly pronunciation" (cited in Gilbert, 2008, p. 42), but Kenworthy (1987) used the phrase "comfortably intelligible" (p. 3). In terms of intelligibility, Smith and Nelson (1985) presented the following definitions: "(1) intelligibility: word/utterance meaning (locutionary force), (2) comprehensibility: word/utterance meaning (illocutionary force), (3) interpretability: meaning behind word/utterance (illocutionary force)" (pp. 334-336).

To achieve mutual intelligibility in international English communication between people with different linguistic backgrounds, a certain degree of acquisition of a common set of features or elements is required. Researchers have not always agreed on which elements this intelligibility hinges on. Furthermore, the question arises as to which phonetic elements Japanese EFL learners should prioritize in time-constrained pronunciation practice. The important task for EFL pronunciation teaching is to determine which phonemes are the most important for intelligibility and to reflect this in teaching materials (see Seidlhofer, 2005). Seidlhofer strongly recommended separating out nonnative features that negatively affect intelligibility from those that do not in order to make teaching time more effective. Identifying these specific features can be a challenge because elements of pronunciation include both segmentals (consonants and vowels) and suprasegmentals (stress, rhythm, and intonation). Hewings (2004) stated that among segmentals, accurate production of consonants is more important for intelligibility than that of vowels: "Substituting one consonant with another is more likely to lead to communication breakdown than when a wrong vowel is used" (p. 15).

It should also be noted that every language also has a particular set of phonological rules. In this regard, the negative transfer of Japanese L1 pronunciation rules to L2 English have been discussed by a number of researchers (e.g., Avery & Ehrlich, 1992; Kenworthy, 1987; Rogerson-Revell, 2011; Walker, 2010). Kenworthy (1987) stated that "some problems learners have need to be given *high priority* because they are vital for intelligibility" (p. 123), and identified areas of English phonetic instruction that should be a focus for Japanese learners.

Jenkins (2000) attempted to identify the elements that play a crucial role in establishing or compromising mutual intelligibility in L2 English based on discourse data. She concluded that, out of 40 instances of communicative breakdown, 27 could be attributed to pronunciation (and not to lexis, grammar, or world knowledge).

Based on this analysis, Jenkins proposed a pronunciation syllabus called lingua franca core (LFC) for English L2 speakers. However, critics have argued that Jenkins's analysis focused on NNSs to the point of excluding NSs as interlocutors in international communication (Dauer, 2005). Nevertheless, the LFC is still widely discussed, and there is much evidence of its value. Whatever weaknesses exist in the research, Jenkins stimulated attention to the phonological component of English language teaching and illustrated the importance of pronunciation in mutual intelligibility and improving overall communicative competence.

Table 1 presents a cross-analysis of target English consonants identified by various authors. On this basis, those that have high priority in terms of instruction for intelligible pronunciation may be identified.

Table 1. Consonants Requiring Instruction

	Kenworthy (1987) (HP, LP)	Avery and Ehrlich (1992)	Shimizu, in Walker (2010)	Rogerson-Revell (2011)	Uchida (2008)
p	✓		✓		✓ (only final)
b	✓	✓	✓	✓	
t	✓ (i)(u)	✓	✓		✓ (only final and flapped)
d	✓		✓		
k	✓		✓		✓ (only final)
g			✓		
tʃ		✓			
dʒ					
f	✓		✓	✓	✓
v	✓	✓	✓	✓	✓
θ	✓			✓	✓
ð	✓			✓	✓

	Kenworthy (1987) (HP, LP)	Avery and Ehrlich (1992)	Shimizu, in Walker (2010)	Rogerson-Revell (2011)	Uchida (2008)
s	✓(followed by /i/)	✓	✓		✓ (only followed by /i/ and /i:/)
z			✓		✓
ʃ	✓(followed by /ɛ/)	✓		✓	✓ (only followed by /i/ and /i:/)
ʒ			✓		
h			✓		
m					
n			✓		
ŋ			✓		
l		✓	✓	✓	✓ (only dark /l/)
r		✓(only initial)	✓	✓	✓ (only /dr/ and /tr/)
j		✓(only initial)	✓		
w	✓(except followed by /a/)	✓	✓		
h	✓(followed by /i/, /u/)				

Note. Substitute consonants are also marked. For example, Kenworthy (1987) stated that Japanese people substitute /d/ for /r/, so that "*resign* may sound like *design*." Thus, both /r/ and /d/ are marked. Parentheses show cases for which instruction is required only in limited phonological environments. Kenworthy (1987) identified high priority (HP) and low priority (LP) consonants; both are listed here.

As is clear from Table 1, the number of sounds, and the specific sounds identified, differ from one author to another. This is presumably because (a) their selection criteria vary, (b) the selection is in one case based on empirical study, and (c) the selection is in some cases based on actual experience with Japanese L1 EFL speakers. Among the five studies cited in the table, only that of Uchida (2008) was based on empirical data.

Method

Based on the research findings regarding problematic English sounds discussed above, problem consonants were identified for the present study. A list of 23 English words reflecting those often encountered among Japanese university EFL students was constructed to include these sounds for purposes of the intelligibility evaluation. The words have been imported into Japanese, where they are in common daily use, but with a *katakana* pronunciation. (*Katakana* is a Japanese syllabary used to indicate the pronunciation of foreign words). The list contained the following 23 words in this order: *locker, egg, rabbit, thirteen, theater, white, fruit, real, surfing, dog, hamburger, vanilla, hotdog, girl, power, weather, sauce, volunteer, mayonnaise, battery, city, button, name*. The target problematic consonants are underlined here, but were not indicated on the actual script read by the students. On the script, a Japanese translation was presented next to each English word. Two of the words on the list, namely *mayonnaise* and *name*, do not contain the troublesome consonants cited in the literature. The focus for these two words was the vowel sound. These were included based on Uchida's (2008) suggestion to train Japanese learners in the pronunciation of vowels.

The 23 words were read aloud by 40 Japanese university students, all 1st year engineering majors, and audio recorded. It was observed that all but one of the students sounded very similar in terms of segment production, as is often observed in EFL classrooms. The recordings of three students were randomly selected from the 39 recordings that were similar. (The student who differed from the rest, who had more native-like pronunciation, later mentioned that his mother was an English teacher and had given him pronunciation training since he was young.)

The three recordings were edited for the purposes of the research, with a number inserted prior to each word, for example, "*One*, locker; *two*, egg," and so on. This was done solely to make it easier for the evaluators to write down the words they heard. These edited files were used in the evaluation phase of the research.

The recorded words were evaluated by two groups of participants, namely a NS group and a NNS group, at international hostels in the United States of America during a 1-month field study. The NS group consisted of 18 speakers, and the NNS group of 24 speakers from various countries around the world. The participants' details are given in Table 2.

Prior to the evaluation, a questionnaire was used to collect data on the participants' linguistic background and language experience. The main purpose of the background check was to exclude participants who had had extensive exposure to Japanese. All participants were in their 20s and 30s and were sufficiently proficient in English to conduct comfortable conversation and complete the evaluation task without interference. The participants listened to the three recordings of the 23 words read aloud by the Japanese university students with earphones attached to a computer. Each participant wrote down each word they heard and listened twice consecutively to each of the three recordings. Even in natural conversation between two L1 speakers, one interlocutor may request the repetition of a word; thus, it was decided to play each recording twice. The possibility of a practice effect was noted, but was unavoidable in this case. Thus, each participant listened a total of six times. Participants were requested to write a question mark in the relevant space if they encountered a word they could not identify. Following the evaluation, participants were requested to pronounce each word, and this was checked against their written answers along with the meaning. This procedure aimed to avoid the possibility of confusion due to spelling errors. The data were analyzed by assigning one point to each word correctly identified. As each word was recorded once

each by three speakers, and there were 42 evaluators, each word had a possible total of 126 points. The number of words correctly identified and the percentage of correct identifications for each word were calculated.

Table 2. Participants' List by Nationality and First Language (*N* = 42)

	Nationality	First language	Number
Native English speakers	American	English	9
	British	English	4
	Canadian	English	2
	Korean	English	1
	Taiwanese	English	2
Subtotal			18
Nonnative English speakers	American	French	1
	Brazilian	Portuguese	3
	Dutch	Dutch	2
	Chinese	Chinese	1
	French	French	5
	German	German	5
	Ghanaian	Hausa	1
	Mexican	Spanish	1
	Swedish	Swedish	4
	Taiwanese	Chinese	1
Subtotal			24

Results

Figure 1 presents the intelligibility rate of each word as reflected by its correct identification by the 18 NS evaluators. The average rate was 55%. Of the 23 words, 10 scored lower than 50% intelligibility (*real*, *volunteer*, *weather*, *locker*, *button*, *surfing*, *vanilla*, *battery*, *girl*, and *theater*), whereas *hotdog*, *power*, and *hamburger* scored above 90% intelligibility.
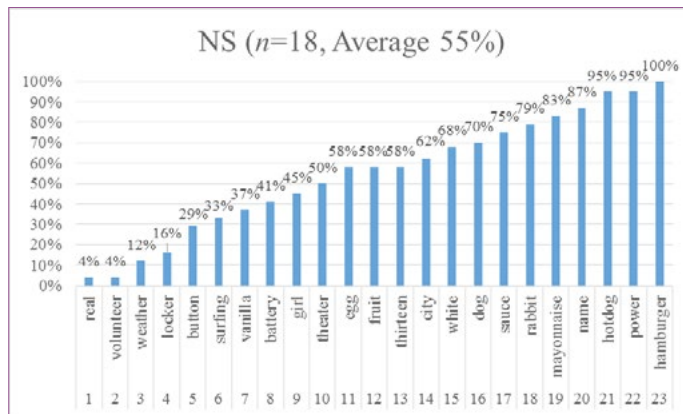

Figure 1. Intelligibility rates of 23 words for 18 NS evaluators.

Figure 2 presents the intelligibility rate of each word as reflected by its correct identification by NNSs. The average intelligibility was 47%. Of the 23 words, 11 scored less than 50% intelligibility (*real*, *weather*, *vanilla*, *button*, *volunteer*, *theater*, *locker*, *thirteen*, *surfing*, *girl*, and *battery*), whereas *hamburger* alone scored greater than 90% intelligibility.
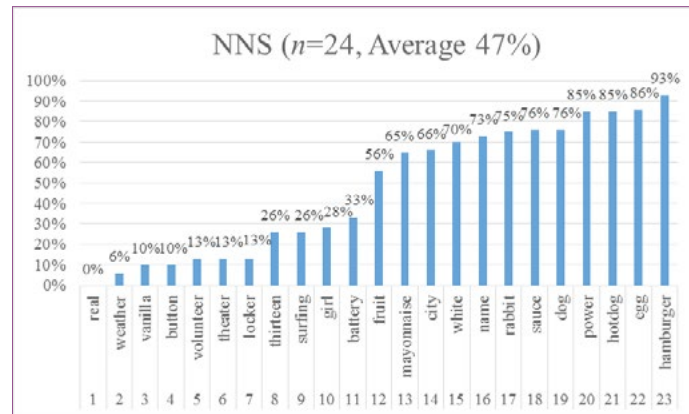
Figure 2. Intelligibility rates of 23 words for 24 NNS evaluators.

Figure 3 presents the average intelligibility rate for each word as evaluated by NSs and NNSs combined. These results show that, when presented as single words, these words common in daily use reflected a range of intelligibility. When both /l/ and /r/ occurred in a word, such as in *real*, the intelligibility was extremely low for both NSs and NNSs. Of the 42 participants, only one was able to correctly identify the word *real*. (This participant had been exposed to Korean at home). There were words whose intelligibility differed depending on whether the listener was a NS or NNS.
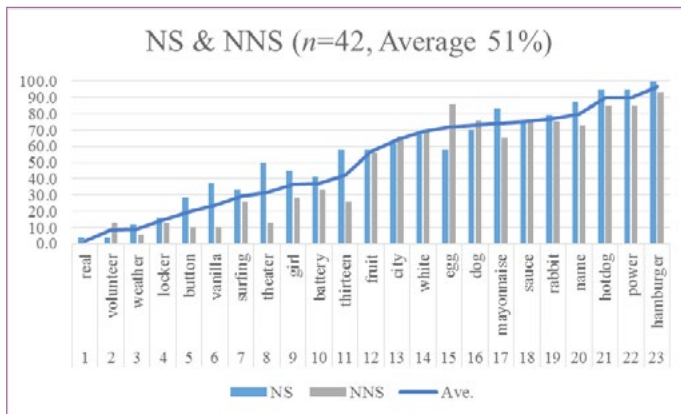
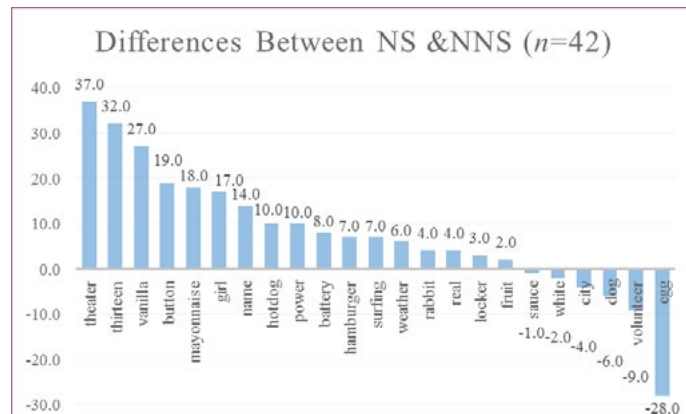Figure 3. Average intelligibility of 23 words as evaluated by 42 NSs and NNSs.

Figure 4. Differences in intelligibility of 23 words as evaluated by 18 NSs and 24 NNSs. Positive numbers = more intelligible to NSs; negative numbers = more intelligible to NNSs.

Figure 4 presents the differences in intelligibility as reflected in NS and NNS evaluators' perceptions of the recorded words. The positive numbers represent the percentage at which the word was more intelligible to NSs whereas the negative numbers show the percentage at which the word was more intelligible to NNSs.

Furthermore, there were words for which the intelligibility rate varied between NSs and NNSs. The largest differences occurred for the words *theater*, with a 37% difference, *thirteen*, with a 32% difference, and *vanilla*, with a 27% difference. All three of these words were more intelligible to NSs than to NNSs. The word *egg*, with a 28% difference, was more intelligible to NNSs than to NSs.

Table 3 presents a comparison of the words read by the Japanese university EFL students and the words or sounds perceived by the NS and NNS evaluators.

Table 3. Intended Words Versus Perceived Words

Intended words	Perceived words
locker	loca, Rocca, rock, rocka, hook, lock, lua, loka, local, rocker
egg	ink, hey, uncle
rabbit	habit, loved, David
thirteen	something, sudden, searching, studying, sardine, Saturday, suddenly, certain, sadden, satin, searching, seventeen
theater	shelter, Seattle, cheddar, shelter, share, shuttle, shatter, siesta
white	quiet, write, quite, right, wait, height
fruits	roots, root, loot, roof, route, rude, flute, blue, roads, throat, cruse
real	beer, deer, near, year, here, yeah, ear, yum, door, yellow, dear, yard, wear, yarn, dairy, jar, yell
surfing	something, starving, saving, savvy, serving, saving, some, sorry, sewing, seven, solving save, sour cream
dog	knock, nook dock, look, hack, duck, doc
hamburger	hangover
vanilla	vineyard, burger, Spaniard, burger, barnyard
hotdog	home
girl	car, dark, garden, guard
power	(no examples)
weather	razor, wizard, blizzard, result, with measure, visa visit, lizard, without reason
sauce	source, south
volunteer	one tire, one tea, frontier, 1 pm, bartender, on tear, guarantee, one chair, reindeer, reenter
mayonnaise	marinade, wildness, illness, mildness

Intended words	Perceived words
battery	party, buddy, body, laundry, lottery, Pater, put
city	steal, ski, steel tea, Steve, steak still, fifty
button	bottle, bottom, voting, butter, victim, photo downtown, motor
name	egg, nail

In most cases of uncertainty, the evaluators left a blank space or question mark on the evaluation sheet. However, the incorrectly perceived words that were written down varied widely. For words that began with the consonant /θ/, *thirteen* and *theater*, the initial sounds were all perceived as /s/. Similarly, the sound /r/ was not identified in *real* or *rabbit*. The consonant /f/ in *fruits* and /v/ in *vanilla* and *volunteer* showed the same tendency—the intended initial sound was not correctly perceived. It is assumed that the misperception of these initial sounds greatly lowered the intelligibility of the words. It is also assumed that these sounds require practice. Thus, without the presence of situational clues, the words pronounced by Japanese university EFL students have the potential to cause communication breakdowns.

Application of the Findings to Teaching

The findings regarding intelligibility among NSs and NNSs from the evaluation phase were integrated into teaching materials and utilized in a class on EFL pronunciation with 36 first-year university pharmaceutical students. The class took place on the first day of the semester. The purpose of applying the data in this way was to raise the students' awareness of the importance of pronunciation training as part of their EFL learning under the assumption that, like many EFL students, these students had previously lacked sufficient opportunities to improve their pronunciation. The aim was for the learners to realize why pronunciation practice is important and to motivate them to practice.

Table 6. Japanese Student Assumptions About Intelligibility of Words (*N* = 36)

Difficulty for NSs and NNSs to understand	Word (number selecting word)				
Most difficult	locker (18)	bottom (18)	sauce (17)	fruit (16)	egg (14)
Easiest	surfing (2)	city (2)	name (2)	hamburger (0)	hotdog (0)

Note. The numbers represent how many students selected the word as being more difficult.

The students' selection of words that might be difficult to understand was quite different from the NS and NNS data of words which were actually most difficult to perceive presented in Figures 3 and 4. The students appeared to be unaware of which sounds would require training in order to raise the intelligibility of their EFL for communication at the international level. Whereas the words *hotdog*, *hamburger*, and *name* were correctly not selected as difficult, the words *surfing* and *city* were not present in the top five intelligible words to NS and NNS listeners and therefore would require practice.

The EFL students evaluated the pronunciation samples as not highly intelligible; however, over half rated their own pronunciation even lower (see Table 7).

Table 7. Student Self-Evaluation Compared With Samples (*N* = 36)

Less intelligible	Same	More intelligible
53%	39%	8%

Whereas this was not the main point of the present study, the students' responses imply that inadequate instruction not only affects intelligibility, but also contributes to a negative attitude toward and low confidence regarding their own overall English ability. As Japanese EFL students are not provided with sufficient explicit opportunities to learn pronunciation or to practice correctly articulating newly introduced sounds, they may remain uncertain about the correct pronunciation of certain English sounds and may feel that their English will not be understood by either NSs or NNSs. This could be the reason for their hesitation to speak and even their fear of attempting to produce English utterances, despite years of English learning. If learners are encouraged to develop this aspect of their language proficiency and to move beyond the fear and hesitation it encourages, they may be better able to utilize and strengthen their existing English skills through actual language use and thus develop more confidence in their overall English ability.

As a step in this direction, the presentation of authentic data on NS and NNS intelligibility appeared to act as a trigger in the present study. The students' answers to the survey revealed that they felt intelligibility of pronunciation was poor for Japanese EFL learners in general, themselves included. However, the classroom exercise appeared to open their eyes to the ways in which their EFL pronunciation could be misperceived.

Pedagogical Implications

As mentioned in the methodology section, by the end of the evaluation phase, each evaluator had listened to the same 23 words six times. A practice effect had been a concern, and it was thought that the intelligibility rate for the third recording might be greater than that of the first. However, this concern was shown to be unfounded; intelligibility did not increase over repeated listening opportunities. This finding implies that communication breakdowns due to pronunciation issues cannot be resolved by the Japanese speaker of English simply repeating the word with the same pronuncia-

tion. Indeed, many of the evaluators in this study were eager to be told the target words, as they had tried hard to understand them, despite some discomfort and irritation. Some offered tips on how the sounds may be improved in order to be intelligible, and some NNSs shared anecdotes about their own EFL pronunciation learning experiences.

The results of this study suggest that pronunciation teaching is crucial for Japanese university EFL learners to achieve an internationally intelligible level of English. The results imply that a lack of appropriate phonetic instruction is one cause of the low level of intelligibility among these learners. The lack of explicit pronunciation instruction and articulation practice during 6 years of English instruction at school prevented them from achieving intelligibility. As a result, many of the words they produced were not identifiable by NSs and NNSs. In order for university level EFL learners to attain internationally intelligible English, appropriate teaching materials need to be designed and widely implemented.

Bio Data

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