

*Effects of EFL Instruction Utilizing International Phonetic Alphabet (IPA)
on Intelligibility of Japanese Students*

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Abstract

This study focuses on the intelligibility of Japanese students' pronunciation. Japanese students are handicapped in acquiring English as a foreign language (EFL) because Japanese differs from English, especially in the phonetic system and the relation between letters and sounds. The shortest unit of Japanese sound is a mora, while that of English is a phoneme. Therefore, Japanese students tend to insert vowels between consonants, and as a result, they have difficulties in both having their utterances understood and understanding English native speakers' pronunciation. In other words, Japanese students' pronunciation lacks intelligibility. The problem is that most teachers use Japanese letters to express English sounds from the early years of EFL instruction. Although international phonetic alphabet (IPA) is taught at highly selective schools, it has been judged to be too difficult for slow learners. The aim of this study is to prove that slow learners are capable of acquiring IPA and prove their effect on intelligibility. The experiment was executed in a class named "Four Skills in English" for 18 slow learners at university. The experiment has four steps: 1) a pronunciation test is given as pre-test. 2) The students take the class for one semester, and each period of the class includes a module time of instruction using IPA. 3) The same pronunciation test is given at the end of the semester. 4) An English native teacher assesses the test with a perspective of intelligibility. As a result, the statistical analysis of the scores of pre-test and post-test revealed that the students improved in intelligibility.

Keywords: intelligibility, pronunciation, explicit instruction, international phonetic alphabet (IPA)

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Introduction

No one will deny that English is the lingua franca of the globalized society of today. The number of people who use English as a second language or foreign language exceeds that of people who use English as their mother tongue. In this situation, fewer and fewer people think they need to pronounce English just like a native speaker. For instance, Singlish (English with a Singaporean accent) or Hinglish (English with a Hindi accent) has become acceptable in the globalized world. However, is English with a Japanese accent acceptable? The answer is no. It is common for Japanese tourists who go abroad for the first time to find it difficult to be understood by the cabin attendant on the flight. They say, “I asked for coffee, and I got a Coke instead. Why don’t they understand my English pronunciation?” This is because their pronunciation is /ko:hi:/ instead of /kafi/, and they put an accent on both vowels of “o” and “i.” Japanese differs from English, especially in the phonetic system and the relation between letters and sounds.

The system of English education in Japan, however, has never focused on instructing students on pronunciation. This led to self-torture among Japanese students, one of whom said, “We cannot be good at oral communication in English despite six years of learning it through junior and senior high schools.” It is in the nature of things that we cannot process the sounds which we cannot pronounce. With the purpose of improving English education drastically, the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) in Japan introduced English activities for oral communication into elementary school—fifth and sixth grades—in 2011, and designated “Oral Communication” as a mandatory subject in high schools in 2013. Subjects such as Oral Communication are effective in growing a positive attitude toward communication. Practically, in activities for oral communication, students actively communicate with peers or teachers in English with a Japanese accent, which is intelligible solely among themselves. It is necessary for students to learn how to pronounce words in English. To support this idea, the problem of the lack of intelligibility in pronunciation will be explored in this study. Moreover, an experiment will be conducted in order to verify the effects of pronunciation instruction.

Literature Review

Japanese language has a system of open syllables (Satoï, 2013). The shortest unit of Japanese sound is a mora, while that of English is a phoneme. That is why Japanese native speakers are apt to insert vowels between consonants or add a vowel after the last consonant of an English word. For instance, “milk” has become a loanword in Japanese, and the sound is /miruku/. The sound of “strawberry” is /sutoroberii/. “Strawberry” is counted as three syllables, while /su/ /to/ /ro/ /be/ /ri/ /i/ is counted as six moras. Word accent does not exist in Japanese words, including in loanwords from English.

Prosody also plays a significant role in intelligibility. English has stressed syllables, which enable a sentence to keep an equal space between each accent as follows: **What** do you **have** in your **bag**? (each of the three bold words has a stressed syllable.) Rise and fall of pitch in a sentence introduces intonation. Intonation has the function of expressing feeling, emotions, attitudes, and discourse information of a speaker (Satoï, 2013). Satoï calls an utterance with the right prosody “English-like.” Japanese-

accent lacks “English-like” sounds. It makes their pronunciation unintelligible for English native speakers.

The international phonetic alphabet (IPA) consists of phonetic symbols consolidated by the International Phonetic Association. The IPA has been modified into simpler signs in Japan. Table 1 shows the simpler version of IPA for vowels, which has been mainly used in Japanese dictionaries for English learners (Imanaka, 2004).

Table 1: The simple version of IPA for vowels used in Japan

spelling	eat	it	egg	may	apple	hot	cup	heart	bird	ball
vowel in IPA	i:	i	e	ei	æ	a	ʌ	a:r	ə:r	ɔ:
spelling	court	both	blue	book	buy	how	boy	dear	hair	poor
vowel in IPA	ɔ:r	ou	u:	u	ai	au	ɔi	iər	eər	uər

The IPA for the vowels shown in Table 1 is the simplest version in various dictionaries. Some dictionaries include more signs like /ɪ/. Japanese has an /i/ sound but not an /ɪ/ sound. Therefore, it is hard for the Japanese to identify /ɪ/ and /i/. Moreover, it does not lead to serious misunderstanding if one pronounces “it” not as /ɪt/ but as /it/. By these two reasons, /ɪ/ and /i/ are integrated into /i/ in Table 1. It is not necessary to narrow the transcription in IPA used in dictionaries for English learners. This is because using dictionaries with complicated signs might deviate from learners’ goal to acquire English (Imanaka, 2004).

The IPA was modified into simpler signs for consonants as well (Table 2).

Table 2: The simple version of IPA for consonants used in Japan

spelling	book	dog	fish	dog	hat	king	lemon	man
consonant in IPA	b	d	f	g	h	k	l	m
spelling	net	pen	ring	sun	tree	violin	wood	zoo
consonant in IPA	n	p	r	s	t	v	w	z
spelling	three	this	sing	yacht	ship	cherry	juice	
consonant in IPA	θ	ð	ŋ	j	ʃ	tʃ	dʒ	

Japan went through a period of national isolation policy in the Edo period (1600–1868). Therefore, Japanese people had little chance to learn foreign languages until the end of the Edo period. When they started to learn foreign languages, it was reasonable for them to utilize *katakana* to transliterate foreign languages, because they had never seen roman letters. *Katakana* is the square form of *kana*, Japanese letters. Japanese people have transliterated English words in *katakana* since the end of the Edo period. *Katakana* letters that show the sound of “American” are, for instance, “*メリケン*.” As the Japanese syllabary consists of 50 mora sounds (one mora is a set of a consonant and a vowel), “American” is changed into four *katakana* letters that stand for /me/ /ri/ /ke/ /n/. The “*Katakana* method” is perceived in an EFL education in Japan as a bad tradition. Arimoto and Kochiyama (2015) point out that *katakana* is

used even in beginners' English-Japanese dictionaries and guidebooks for junior high school textbooks authorized by the MEXT. It is often seen in EFL class in junior high school that teachers write *katakana* on the board or worksheet and make their students use *katakana* to memorize English pronunciation. In short, using *katakana* is a normal way to teach English pronunciation in junior high schools in Japan. This might be because IPA is judged to be too difficult for junior high school students. As a matter of course, students will never master "English-like" sound later in high schools or universities. Arimoto and Kochiyama (2015) are opposed to using *katakana* and insist that students are capable of acquiring IPA and acquiring pronunciation that is acceptable for native English speakers.

As referred above, prosody should give priority to sounds like vowels or consonants in instruction for EFL learners. When students can distinguish each vowel and consonant sound to some extent, teachers can proceed to the next step and instruct students on prosody such as stress or intonation. IPA has the advantage in this step, because *katakana* represents segmental phonemes, while IPA can represent word stress of supra-segmental phonemes besides segmental phonemes (Imanaka, 2004).

Kochiyama et al. (2010) conducted a survey of university students. It was revealed in the survey that the students had had no opportunity to learn how to pronounce English words in EFL class at elementary and junior high schools. What is worse is that the teachers had never learned how to instruct students in English pronunciation in the teacher training course at university. Phonetics is not a mandatory subject for obtaining an EFL teacher's certificate in Japan (Arimoto, 2010). Notwithstanding this condition, EFL learners in Japan want to improve their English pronunciation (Ohshima & Tara, 2010). It is high time that EFL teachers in Japan stop using the *katakana* method. Makino (2013) devised a way to instruct students in English pronunciation using songs. Although he proved the effects of his method through a questionnaire given to university students, they were limited to self-estimation by the students. Therefore, this study is going to introduce instruction using IPA and prove its effects on intelligibility through the quantitative data of the pronunciation test score.

Hypotheses

The author has two hypotheses:

1. University students in Japan are capable of acquiring IPA.
2. By realizing Hypothesis 1, the intelligibility of students' English pronunciation improves.

The goal of this study is to verify these two hypotheses.

Methodology

The participants of the experiment were 18 university students aged 18 to 21. None of the students had learned IPA. The experiment was conducted in a class named “Four Skills in English” allotted to one semester from September to January.

The experiment had four steps:

- 1) A pronunciation test was given as a pre-test.
- 2) The students took the class, and each period of the class included a module time of instruction using IPA (around 15 minutes).
- 3) The same pronunciation test was given at the end of the semester.
- 4) An English native speaker assessed the test from the perspective of intelligibility.

The process of the pre- and post-test was as follows: each student moved to a room next to the classroom one by one, where the author was waiting to give a pronunciation test. The author showed the student a card on which a picture, the spelling of the word describing the picture, and the IPA of the word were printed (Figure 1).

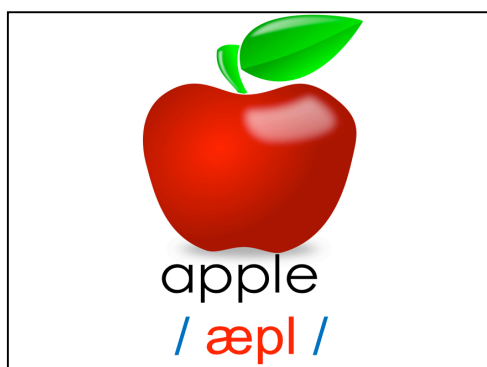


Figure 1: An example of a picture card

Next, the author told the student to read the word aloud and showed ten cards one after another: apple, cherry, cake, salad, ball, bird, bus, three, five, box. All the students' readings were recorded by a digital voice recorder.

In requesting an English native speaker (an EFL teacher in Japan) to assess the test, the author was careful not to saddle her with too many criteria. The simple criterion was as follows: assess the students using five grades from the perspective of intelligibility (grade one was the lowest, and grade five was the highest). Additionally, for the same reason—not to saddle the assessor with too many criteria—the author narrowed the objectives just to words, not idioms or sentences. The literature review had certainly led the author to think that intelligibility results from segmental phonemes like vowels and consonants, and supra-segmental phonemes or prosodies like word accents. The simplified IPA still keeps two things to indicate long vowels /:/ and accent vowels //, and learners can comprehend prosody in a word such as “president” /p'rezədnt/. The test covering words can judge both segmental and supra-segmental phases.

The score of the pre-test is shown in Table 3.

Table 3: The score of the pre-test

No.	apple	cherry	cake	salad	ball	bird	bus	three	five	box
1	3	2	3	3	3	2	3	2	2	2
2	3	2	3	2	3	3	3	3	3	2
3	2	2	2	2	3	3	3	2	2	2
4	4	4	4	4	4	4	4	4	4	3
5	3	3	3	3	2	3	3	2	2	3
6	3	2	3	2	3	3	3	2	3	3
7	3	3	4	3	3	3	3	2	3	3
8	3	2	3	3	3	2	3	2	3	2
9	3	3	3	3	3	3	3	2	3	2
10	3	4	3	4	3	3	3	2	3	3
11	3	3	3	2	3	2	3	3	3	4
12	3	3	3	3	3	3	3	2	3	3
13	3	3	3	2	3	3	4	2	3	3
14	3	3	3	2	3	3	3	2	3	3
15	3	3	3	1	3	3	3	1	2	1
16	2	3	3	3	3	3	3	3	3	3
17	3	3	3	4	4	4	4	3	4	4
18	3	3	3	2	3	3	3	2	2	4
M	2.944	2.833	3.056	2.667	3.056	2.944	3.167	2.278	2.833	2.778

The score of the post-test is shown in Table 4.

Table 4: The score of the post-test

No.	apple	cherry	cake	salad	ball	bird	bus	three	five	box
1	4	4	4	2	4	4	4	3	4	4
2	3	3	4	4	4	4	4	4	4	3
3	4	4	4	5	5	5	5	5	5	5
4	4	3	4	4	5	4	5	4	4	4
5	5	5	5	3	4	4	4	3	4	4
6	4	4	5	4	4	3	4	3	4	4
7	4	4	4	5	5	4	4	3	4	4
8	4	4	4	4	4	5	4	3	4	4
9	4	4	5	3	4	4	4	4	5	5
10	3	4	4	3	4	4	4	3	4	5
11	5	5	5	4	5	5	5	4	5	5
12	3	3	4	3	3	3	4	3	4	4
13	3	4	4	4	4	4	5	3	5	4
14	4	4	5	5	5	4	5	3	5	5
15	3	4	4	4	5	4	5	4	5	5
16	4	3	4	4	5	5	5	5	5	5
17	3	4	4	4	4	5	5	3	4	4
18	5	5	5	5	5	5	5	5	5	5
M	3.833	3.944	4.333	3.889	4.389	4.222	4.500	3.611	4.444	4.389

In a pilot test conducted before this experiment, two assessors (A and B) assessed the junior high school students' pronunciation using the same criterion. Both the assessors were native English speakers. The reliability of the test was proved (Table 5 and Table 6).

Table 5: The results of the pilot test by two assessors

	M	SD	N	means of the scale	dispersion of the scale
Assessor A	3.4190	.52875	174	3.0776	.121
Assessor B	3.0776	.34727	174	3.4190	.280

Table 6: The statistic reliability

Cronbach α	number of categories
.521	2

The pre- and post-test of the experiment in this study were assessed by Assessor A, and her assessment can be judged to be reliable.

The scores of the pre-test excel those of the post-test, as shown in Table 3 and Table 4. The scores of the pre- and post-test were compared and analyzed statistically. Statistical significance was found in each word (Table 7).

Table 7: The results of a test of significance of pre- and post-test

	apple	cherry	cake	salad	ball	bird	bus	three	five	box
<i>t</i>	4.596	5.301	8.482	4.385	7.680	6.438	8.816	5.515	8.519	6.758
<i>df</i>	34	34	34	34	34	34	34	34	64	34
<i>p</i>	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Findings

The first hypothesis of this study was that "University students in Japan are capable of acquiring IPA." After instruction using IPA was given during a semester, scores of students' pronunciation test improved. The observations in the post-test showed that students tried to pronounce words by reading IPA and that they apparently utilized the knowledge of IPA. The results proved the first hypothesis.

The second hypothesis of this study is "By realizing Hypothesis 1, the intelligibility of students' English pronunciation improves." The results of the statistical analysis of pre- and post-test scores proved the enhancement of students' pronunciation of all ten words. The criterion of the test assessment is intelligibility. This study succeeded in verifying both hypotheses.

Qualitative data from observations during the experiment also offered interesting findings. The participants of the study had no experience of learning IPA or

confidence in their own pronunciation. Some of them even showed antipathy when they heard that they were to learn IPA at first. Nevertheless, they said their impression of IPA had perfectly changed at the end of the semester. Acquiring IPA is easier than they imagined, and they are sure of their enhancement of English word pronunciation. Some of them referred to prosody as follows: “Now I feel I mastered word accent. My English is ‘English-like’.” Students wished if they had learned IPA in junior high school. One of them said, “If I had learned IPA in junior high school, I would have been a better speaker of English.”

Conclusion

The originality of this study is that it focused on the intelligibility of Japanese students’ pronunciation and on the differences between Japanese and English in their phonetic systems and the relation between letters and sounds. No previous researchers had noticed the influence of Japanese history and EFL instruction using *katakana*. This study explored an alternative method of instruction using IPA instead of *katakana*. The experiment revealed that university students were able to acquire IPA and that the intelligibility of their English pronunciation improved. This study can be concluded with the suggestion that EFL instruction in Japan should focus on pronunciation, including prosody, and that utilizing IPA is an effective way to provide pronunciation instruction.

More points are left that need to be studied and proved, such as can students pronounce sentences with context with intelligibility? Can they identify prosody in others’ utterances and improve their listening comprehension? The criterion of the test is intelligibility, but is it valid? Is acceptability or another criterion more valid? The most significant question is, is instruction using IPA effective for younger learners? This study is just the start of an extensive project.

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