Contrastive Analysis of Japanese and English Liquid Sounds

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This paper investigated one of the most baffling phonological difficulties pertaining to Japanese learners of English: the differentiation between English /l/ and /r/ phonemes both in listening and speaking phrases. More specifically, Japanese has no /l/ sound but has /r/. Thus Japanese learners of English are said to have difficulty pronouncing English /l/ but substitute Japanese /r/ for English /r/. In other words, the pedagogical emphasis has been primarily placed on the acquisition of English /l/ sound. However, can the Japanese learners of English always apply the Japanese /r/ for the English /r/ without causing any miscommunication? The study was conducted to find out whether it is true that the Japanese /r/ always sounds like /r/ rather than /l/ to native English speakers. Eighteen American graduate students were asked to listen to thirteen sets of minimal pairs of Japanese loan words from English. The results show that the Japanese /r/ of many words sounds more like English /l/ than English /r/. The pedagigical implications from this study is that both English /l/ and /r/ sounds should be equally emphasized in classroom teaching.

Introduction

Ironically, many Japanese English teachers often jokingly tell their students a story of a Japanese tourist in the United States: One day he enters a restaurant and orders rice, but the waiter brings him lice. Many students do not take this very seriously, though. In this extreme case, the Japanese speaker of English does not have to experience /l/-/r/ phobia because it is unlikely that lice are served in the resturant. As was pointed by Carruthers (1983: 102), usually context, both linguistic and situational, will clarify meaning.

The problem, in brief, stems from the fact that Japanese makes no distinction between the two sounds, or to be more exact, Japanese has a sound that is not identical with either of them. According to Robert (1976: 51), this problem however is not peculiar to the Japanese speaker but also common to many other oriental second language speakers of English. Probably because, as Fromkin and Rodman (1986: 45) pointed out, /l/ and /r/ are very similar acoustically.

The point is, however, that English has a lot of minimal pairs of the two phonemes that often cause misunderstanding for the Japanese speaker of English. Look at the following minimal pairs:

	/l/		/r/
1	fly	·····	fry
2	right	·····	light

3 lock ····· rock

I present these three pairs here because they are frequenly used English loan words in today's Japanese socuety. I would like to present an example phrase for each pair as follows:

Pair 1. gaiya furai (outfield fly in baseball)
furai pan (frying pan)

Pair 2. raito goro (right field grounder in baseball)
raito o tsukeru (turn on the light)

Pair 3. rokku suru (lock the door)
rokku ongaku (rock music)

Those six loan words in Pair 1, 2, and 3, in addition to the above examples, are used in many other contexts. Japanese students, most of whom start studying English at the age of thirteen, have already long used those words in their daily conversation before they receive formal English education. Quite a few Japanese do not even know that these pairs have different English original words. Richards et al. (1985: 31) claim that "if a borrowed word or phrase is widely used, most speakers will pronounce it accoring to the sound system of their own language." This paper will first delve into the mechanism of the two English phonemes /l/ and /r/, and the Japanese /r/.

The Mechanism of Japanese and English Liquid Sounds

Pennington (1988: 35) explains that the phoneme /r/ can be realized phonetically in the following ways:

/r/ ····· [ɹ] retroflex
····· [r] trill
····· [ɾ] flap

The third sound is generally said to be the sound of the consonant of the Japanese syllables*ra, ri, ru, re, ro*. Fromkin and Rodman (1986: 45) define a retroflex [ɹ] as a sound formed by curling the tip of the tongue vibrating against the roof of the mouth, a flap [ɾ] by making the tongue strike against the alveolar ridge.

As far as [ɾ] is considered to be an allophone of /r/, it would be right to assume that for the native speaker of English the above-mentioned Japanese five syllables should sound closer to the retroflex sound than to the lateral sound /l/. This is evident from the use of the letter *r* to transliterate these five sounds into romanized letter. However, does it allow Japanese speakers of English to substitute the Japanese flap sounds for the English retroflex sounds? In other words, if the Japanese speaker pronounces *RIGHT* as they usually pronounce the loan word *RAITO*, do native speakers of English always take the meaning for *RIGHT* and never take for *LIGHT*? This study investigated this point. Specifically, the present study explored the following untested assumptions that are often heard:

1) Japanese has r-sounds but no l-sounds.
2) That's why the Japanese learners of English have difficulty pronouncing English lateral sounds.

Experiment

The experiment was held twice. The first experiment involved eighteen American English speakers; the second experiment involved seventeen Chinese speakers (eight Mandarin speakers and nine Cantonese speakers).

Experiment 1

Methodology

Subjects

The subjects involved in this study were eighteen American English speakers who studied in the MA Program at the Department of English as a Second Language at the University of Hawaii at Manoa. They were selected on the basis of their availability to the researcher at the time of data collection. As a control variable, those who had learned Japanese or had been in Japan were excluded in this study. The eighteen native speakers of English came from the following states:

Hawai'i	5 subjects
California	5
Colorado	1
Indiana	1
Kansas	1
Mississippi	1
Minesota	1
New York	1
Texas	1
Wyoming	1

Material and Procedures

The material used in this study was a recorded version of the following 13 Japanese loan words from English. Each was pronounced rather clearly at natural speech twice by the researcher. The speech was tape-recorded and listened to by the subjects to choose from the English words one which sounded closer to the Japanese pronunciation. The thirteen couples of words were excerpted from Harritte Gordon Grate's "English Pronunciation Exercises for Japanese Students" (1974: 2-14). They were all minimal pairs. In order to see if there is any relationship between the results and the position of the liquid sounds, they were grouped together according to the position where the liquid sounds appeared: item # 1 to # 3 in initial position (the first syllable), from # 4 to # 8 in medial (the second syllable), and # 9 to # 10 in final position.

Figure
Loan words and minimal pairs

Item No.	loan word	English equivalent	minimal pairs
#1	ruumu	room	room/loom
#2	raisu	rice	rice/lice
#3	risuto	list	list/wrist
#4	furunto	flute	flute/fruit
#5	kurei	cray	cray/clay
#6	purei	play	play/pray
#7	guriin	green	green/glean
#8	paresu	palace	palace/Paris
#9	mairu	mile	mile/mire
#10	gooru	goal	goal/goer

Results and Discussion

The table shows the results of the experiment. The figures in the number of subjects who chose the word closer to the Japanese loan word, and the IF (item facility) means the rate that at which the subjects chose the right word intended by the speaker, i.e.the researcher.

Table
The Results of Cjoice

Item	Choice	IF	Item	Choice	IF
#1	17/3	85%	#6	10/10	50%
#2	11/9	55%	#7	17/3	85%
#3	17/3	85%	#8	5/15	25%
#4	8/12	40%	#9	12/8	60%
#5	13/7	65%	#10	16/4	80%

After the experiment, many of the subjects pointed out that some words had not been pronounced consistency between the first reading and the second reading. This may be evidence that Japanese does pronounce the liquid sounds interchangeably.

The results show in general that when the liquid sound appears either at the beginning or the end of words, IFs are relatively high (# 1, # 3, # 10). When liquid sounds occur in the middle, IFs are low (# 4, # 6, # 8). Each of the minimal paris has stress on the same syllable, which is also true of the Japanese loan words although Japanese stress is less conspicuous. This indicates that subjects' choices were entirely based upon the pronunciations of the words.

Experiment 2

The second experiment was held eight months after the first experiment. The following modifications were made to the design. First, the experiment involved Chinese speakers. Seven were Mandarin speakers; nine were Cantonese speakers. Second, the minimal pairs were recorded by four Japanese native speakers from different parts of Japan: from Hokkaido, Tokyo, Osaka, and Fukuoka. This is because there may have been some reginal accent that affected the results in the first experiment. By involving those four different persons from four different regions, the reliability of the experiment should be improved.

Results

The results show that the Japanese flap sound very often sounds rather like the English lateral sound /l/. Some related experiment was done by Kimizuka (1967: 47), who made a study of phonological errors upon an analytical study of readings made by five Japandese students at UCLA. The results showed that three of five students pronounced /r/ like /l/. She explains the sound was not exactly /l/ because it was pronounced with the tip of the tongue touching the palate, which the Japanese produce for the American /r/. Ladefoged (1982: 156) argues that in making [ɾ] the air stream may flow over the sides of the tongue, which results in the production of a sound that is intermediate in quality between [ɾ] and [l]. He calls it "a voiced alveolar or lateral flap." He explains that this kind of sound sometimes occurs in English. Just as the Japanese have difficulty differentiating American retroflex sound and lateral approximant, Americans have trouble perceiving the Japanese retroflex lateral flap.

CONCLUSION

In sum, this study showed that substituting the English retroflex sound by the Japanese flap sound could lead to misunderstanding on the part of non-Japanese speakers of English since the Japanese speaker's liquid sound may be closer to the English lateral sound especially when it appears in the middle of words. Therefore, English /l/ and /r/ should be taught as distinctively different from the Japanese /r/.

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