

A STUDY OF /r/

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/r/に関する一考察

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INTRODUCTION

What are most difficult phonemes for Japanese studying English to discriminate? Even a college student, one who has learned English for more than six years, would say /r/ is one of them. Actually, a great number of schoolteachers have mentioned its difficulties in public and students also concede it. There must be several factors beneath such an undesirable condition. After examining auditory discrimination skill, an attempt was made to find some clue to this problem by discussing articulatory features of /r/.

The International Phonetic Alphabet (IPA), which is regarded as the phonetic representation symbol in the widest use today, provides special symbols for various kinds of r-sound in narrow transcriptions. The varieties are to be introduced later as allophones of /r/ although the varieties can be reckoned as dialect variations constituting the same diaphone. For it is considered that duplicate definition of the varieties will cause confusion.

TEST EXPLANATION

Tested Sound Pair and Its Minimal Pairs

It goes without saying that in English discrimination between /r/ and /l/ puzzles Japanese listeners most. Considering this fact, a focus was set on /r/ and /l/, and there were selected three kinds of minimal pairs: right-light, correct-collect, oar-all. The aim of this selection was to know how the listeners' auditory discrimination was affected according to the position of the sounds in a word, i.e., the beginning, the middle, and the end.

Construction of the Test and Recording

After a minimal pair is read, the examinee is required to determine whether she heard the same sound or not. Three sounds relating each minimal pair are read by the examiner

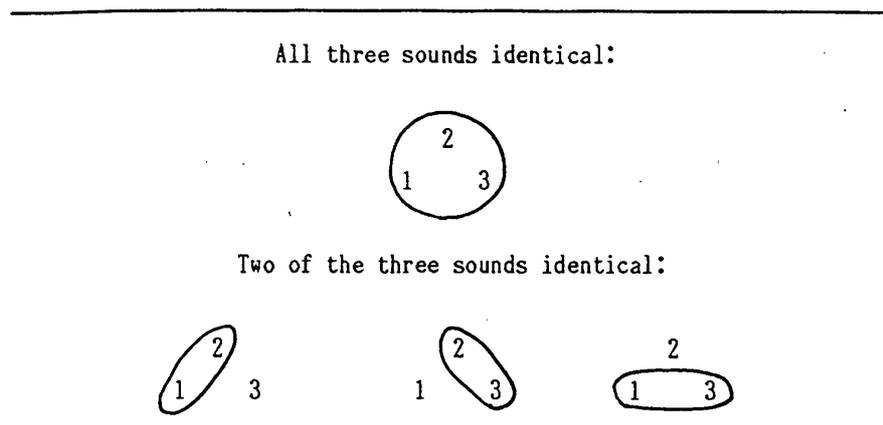


Fig 1 FOUR POSSIBLE TEST ANSWERS

and there are two types of sound sets : all three sounds identical and two of the three sounds identical. The examinee must choose one answer out of four possible answers shown below :

REMARKS : The three numbers were arranged so as to be answerable intuitively.

The /r/-/l/ sound pair was tested eight times according to its position in words for a total of twenty-four problems. Recording was made by an American, male, age forty-one. Each word was read only once at a fixed speed with a regular interval. These are the words recorded :

Table 1 RECORDED WORDS

1. light, light, right	9. correct, correct, collect	17. all, oar, oar
2. light, right, right	10. collect, collect, collect	18. oar, oar, all
3. light, right, light	11. collect, collect, correct	19. oar, all, oar
4. right, right, light	12. collect, correct, collect	20. oar, oar, oar
5. right, right, right	13. collect, correct, correct	21. all, all, oar
6. right, light, right	14. correct, collect, collect	22. all, oar, all
7. right, light, light	15. correct, collect, correct	23. all, all, all
8. light, light, light	16. correct, correct, correct	24. oar, all, all

Testing Procedure

The examinees were ninety-eight English-major freshmen at Miyazaki Women's Junior College. An explanation of the test, including exhibition of the recorded samples of minimal pairs, was given before administering it. For playback of the recorded materials, individual language laboratory (LL) headphones were used. After each column of problems was finished, a pause was made in order to relax the examinees.

DISCUSSION OF TEST RESULTS

Evaluation of Discriminative Error Rates According to the Sound Position

The error rates in discrimination were marked on a scale of 100 % maximum for each sound position. All the rates were rounded to one decimal place. The results turned out to be better than anticipated. This was probably due to information about the test having been previously given to the examinees. They were 3.3 % at the beginning, 17.6 % at the middle, and 2.3 % at the end of words. Compared with the rates at the other positions, however, it could be said that the error rate at the middle position is significant.

Articulatory Features of /r/ and /l/ in Different Positions in Words

The higher error rate at the middle position mentioned above seems to be related with less articulatory difference between /r/ and /l/ at the middle position. Then, what articulatory features did /r/ and /l/ have at each position of the tested words?

When the word beginning with **r**, "right", was pronounced, speech organs had already made an appropriate form for the articulation of **r**: the tip of the tongue was turned up sharply toward the back part of the teeth ridge and the lips were rounded. At the middle of the word, "correct", however, no protrusion would have occurred between vowels with the same form of the tongue at the beginning. At the end of the word, "oar", **r** was decreasing its loudness down to zero as a sort of monophthong with some phonetic quality of the preceding vowel.

About the articulation of /l/, it is well known that **l** can be divided broadly into two types, clear **l** and dark **l**, which are allophones of /l/ in complementary distribution: the former never occurs before consonants, before pauses, or when syllabic; the latter never occurs before vowels or **j**-sound. Thus at the beginning of the word, "light", and at the middle of the word, "collect", the front of the tongue was spread out and raised toward the hard palate with the tip holding against the teeth ridge. In contrast, the back of the tongue was raised toward the soft palate with a depression of the front behind the articulating tip at the end of the word, "all".

VARIETIES OF /r/ AND THEIR DISTRIBUTION

According to Daniel Jones' specification of /r/, there are five varieties as follows:

- (1) fricative lingual **r** [ɹ]

- (2) rolled lingual **r** [r]
- (3) flapped lingual **r** [ɾ]
- (4) rolled uvular **r** [R]
- (5) fricative uvular **r** [ʀ]

It is fricative lingual **r** that is most commonly used in Received Pronunciation (RP). It is articulated by the tip of the tongue against the back part of the teeth-ridge, the main body of the tongue being kept low, the front being held concave to the palate, and the whole tongue being laterally contracted.

Rolled lingual **r** is generally used in Russian, Italian, Portuguese, and Mongolian. In the North of England and in Scotland it is also generally used in initial position in place of fricative lingual **r** of RP. It is formed by a rapid succession of taps of the tongue tip against the teeth-ridge.

Flapped lingual **r** consists of only one single tap of the tongue tip against the teeth-ridge. In positions of weak stress and when consonants follow, a single flapped **r** is usually employed in Scottish English.

Rolled uvular **r** is formed by a vibration of the uvula against the back of the tongue which has a particular kind of raising. This sound is noticed in German and French, and is in common use in place of fricative lingual **r** of RP in parts of Northumberland and Durham.

Fricative uvular **r** is formed like rolled uvular **r** but the uvula never touches the back part of the tongue. Some Germans and French use this sound instead of rolled uvular **r**.

Jones' varieties are from general classification of /r/ from a viewpoint of RP while there is another specification of /r/ from a viewpoint of General American (GE). The specification is :

- (1) retroflex **r** [ɻ]
- (2) central **r**
- (3) fricative **r** [ɹ]

REMARKS: In reference to central **r**, there is no IPA symbol to represent it even in narrow transcription.

Retroflex **r** is commonly used in American English. In addition to a slight protrusion, the tip of the tongue is raised toward the anterior section of the hard palate and flexed slightly toward the back of the mouth.

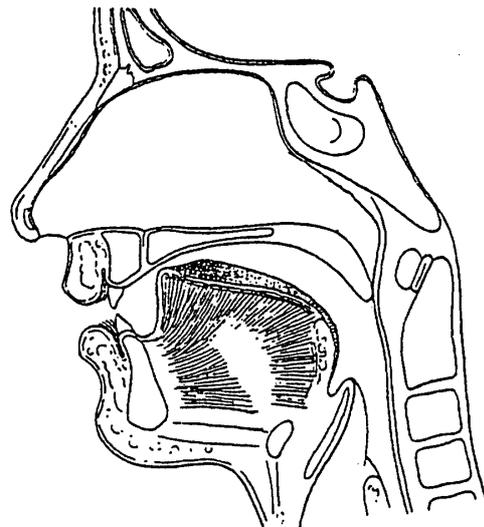


Fig 2 ARTICULATORY ADJUSTMENTS FOR RETROFLEX **r**

Some Americans substitute central **r** for retroflex **r**. The tongue tip is lowered and the central portion of the tongue is raised toward the roof of the mouth about where the hard palate ends and the soft palate begins. The acoustic image of central **r** is quite similar to that of retroflex **r**.

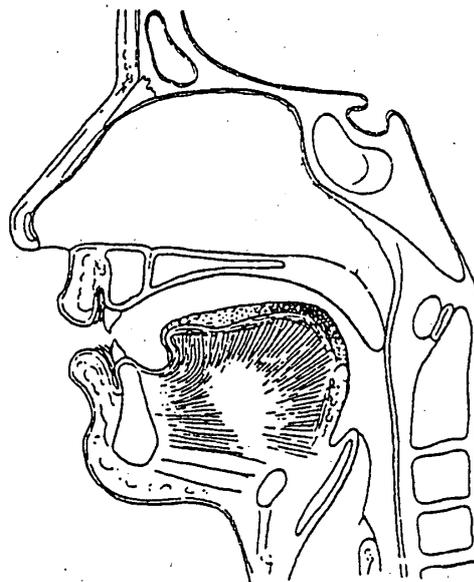


Fig 3 ARTICULATORY ADJUSTMENTS FOR CENTRAL **r**

Fricative **r** is not discussed here since it has been already mentioned above as Jones' fricative lingual **r**. For reference, however, the tongue position of this sound is given.

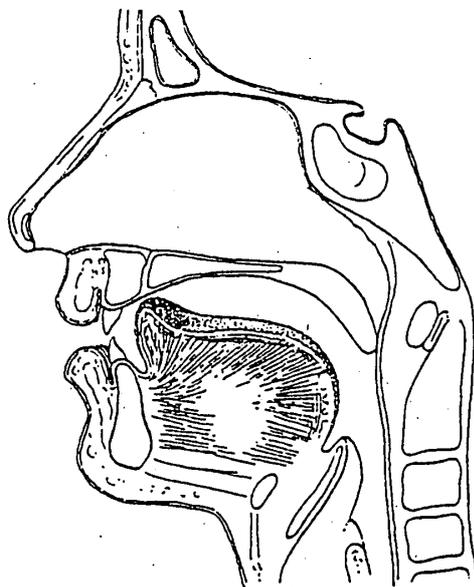


Fig 4 ARTICULATORY ADJUSTMENTS FOR FRICATIVE **r**

Although it is possible to show some other varieties of /r/, it seems to be enough especially for Japanese studying English on the primary level to master one of the three articulation manners (retroflex/central/fricative) shown above. For the former specification, Jones' varieties might be too much for them to digest.

DISCUSSION

Relations between English **r** and Japanese **r**

The /r/ is said to be the most variable of all the consonants in English. Moreover, it varies according to the context where it appears. Since it would be complicated to mention all such varieties, dialectal variations of /r/ are ignored here.

In RP, fricative **r** is commonly used before vowels but never finally or before consonants, and flapped **r** is occasionally used as intervocalic **r**. In GE, retroflex **r** is used more frequently than central **r** whenever the letter **r** appears in the spelling of a word regardless of whether the immediate following sound is a vowel or a consonant.

On the other hand Japanese **r** doesn't seem to be so vacillatory as English **r**. While /r/ in English has both vocalic and consonantal characters, /r/ in Japanese is an entire consonant. For in all Japanese **r**-sounds the tongue tip is momentarily in contact with the teeth ridge or the anterior section of the hard palate. The manner of this contact is determined by the immediate following vowel; some quality of friction is added when closed vowels follow. Considering the instability of the point of articulation, Japanese **r** can be regarded as flapped lingual [ɾ], retroflex plosive [ɖ], or retroflex lateral [ɭ].

Suggestion for Japanese Students

Since some RP speakers are known to use flapped lingual [ɾ] between vowels, one who studies RP has no problem in using it as intervocalic **r**. There would, however, rise some confusion if one studying GE did the same thing. Voiced /t/, which sounds like flapped lingual [ɾ], is frequently employed in GE, e.g., *Betty* [b_Eɾi]. If he pronounces [b_Eɾi] for *berry*, he may be misunderstood to have said *Betty*. One studying GE, therefore, needs to discriminate /r/ from /t/, and hopefully /l/ between vowels, e.g., *berry* [b_Eɾi], *Betty* [b_Eɾi], and *belly* [b_Eli].

Although the articulation of /r/ seems to be so complicated as has been mentioned, one studying English must not forget that in any English /r/ in standard speech the sides of the tongue press against the upper molars and the tip of the tongue never touches the teeth ridge or the hard palate. Among various features of **r**-sounds, these features are common to /r/ in standard English.

Furthermore, linking-r and intrusive-r are other characteristic aspects English **r** has. Adopting the former phenomenon and avoiding the latter phenomenon have been recommended foreigners by many phoneticians. It is, however, hard to decide which way to take. For it is reported that a great many Southern British people (speakers of RP) may now be found

who do not use linking-*r* at all or who restrict its use to very common expressions. And the listener should know the phenomenon of intrusion at least lest he fail to understand what the speaker says.

For Further Study

It would be unavoidable and most useful to set /l/ against /r/ to explain to Japanese students, who originally have no distinctive features between /r/ and /l/, what /r/ is, although it must be simultaneously very laborious and time-consuming. The number of the words tested in the present paper is much smaller than such a desirable number of words as will cover every phonetical context. It is known that the quality of /l/ is much affected by the position of the main body of the tongue which is analogous to the position of vowels and the degree of protrusion accompanying the articulation of /r/ is determined by the adjacent sounds. It is hoped that at the next opportunity more thoroughly chosen materials will produce more fruit.

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