

SOME PROSODIC FEATURES OBSERVED IN THE PASSAGE READING
BY JAPANESE LEARNERS OF ENGLISH

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ABSTRACT

This study aims to see some prosodic features of English spoken by Japanese learners of English. It focuses on speech rates, pauses, and intonation when the learners read an English passage. Three Japanese learners of English, who are all male university students, were asked to read the speech material, an English passage of 110 word length, at their normal reading speed. Then a native speaker of English, a male American English teacher, was asked to read the same passage. The Japanese speakers were also asked to read a Japanese passage of 286 letters (Japanese Kana) to compare the reading of English with that of Japanese. Their speech was analyzed on a computerized system (KAY Computerized Speech Lab). Wave forms, spectrograms, and F0 contours were shown on the screen to measure the duration of pauses, phrases and sentences and to observe intonation contours. One finding of the experiment was that the movement of the four speakers' speech rates showed a similar tendency in their reading of the English passage. Reading of the Japanese passage by the three learners also had a similar tendency in the movement of speech rates. Another finding was that the frequency of pauses in the learners speech was greater than that in the speech of the native speaker, but that the ration of the total pause length to the whole utterance length was about the same in both the learners' and the native speaker's speech. A similar tendency was observed about the learners' reading of the Japanese passage except that they used shorter pauses in the mid-sentence position. As to intonation contours, we found that the learners used a narrower pitch range than the native speaker in their reading of the English passage while they used a wider pitch range as they read the Japanese passage. It was found that the learners tended to use falling intonation before pauses whereas the native speaker used different intonation patterns. These findings are applicable to the teaching of English pronunciation at the passage level in the sense that they can show the learners, Japanese here, what their problems are and how they could be solved.

INTRODUCTION

In the study reported here, we investigated some prosodic features of English spoken by Japanese learners of English. Speech rates, pauses and intonation were considered here because the author believes they play a very important role in communications. These prosodic features are more important than segmental ones in the sense that they are used to transmit not only the speaker's messages but also his/her affective information to the hearer.

Prosodic features of English spoken by Japanese have not been studied extensively, and mostly they have been examined at the segment, phrase or sentence level (cf. for example, Nakaji, 1993; Sugito, 1980; Takefuta, 1982). In this study we observed some prosodic features of English spoken by the learners at the passage level.

The learners' English was compared with a native speaker's English to see how it was different from authentic English. Their passage reading was also compared with their Japanese passage reading to see if there would be difference between the two about prosodic features.

METHOD

Three Japanese college students and an American English teacher, who are all male, were asked to read an English passage of 110 word length consisting of ten sentences after they practiced reading the material. The three Japanese were also asked to read a Japanese passage of 286 letters (Japanese Kana) consisting of seven sentences. Their reading was each saved in the hard disc of the computer and analyzed on a sound analysis system (KAY Computerized Speech Lab). Wave forms, spectrograms and F0 contours were shown on the screen to measure the duration of pauses, phrases and sentences and to observe intonation contours.

RESULTS AND DISCUSSION

A. Speech Rate

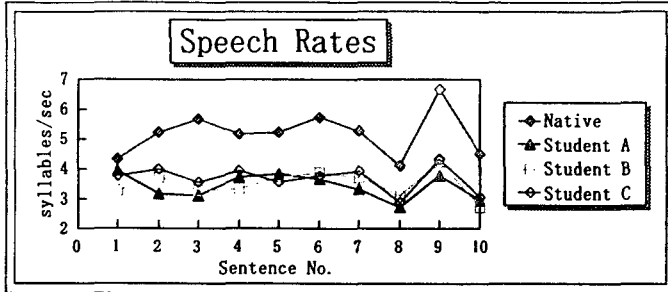
Here the speech rate refers to the number of syllables per second for both the English and Japanese utterances. The speech rate for each speaker through the whole English passage is shown below.

Chart 1 Average Speech Rates: English Passage (syllables/sec)

	Native	Student A	Student B	Student C
AVERAGE	5.19	3.44	3.52	3.71
S. D.	0.74	0.42	0.43	0.43

Figure 1 depicts the speech rate movement in the English passage reading by the native speaker and three Japanese learners. The vertical axis shows the speech rate for each sentence and the horizontal axis shows the sentence number in the passage. In Figure 1 we can observe a tendency that the movement of the speech rates for each speaker is similar to each other though the native speaker has the faster and more variable rate than the learners. In Nakaji & Kanzaki (1996) we found this similarity between the learners' and native speaker's utterances.

Figure 1 The Movement of Speech Rates: English Passage



The correlation coefficients between the speakers were calculated as is shown below. It is clear that the movement of speech rates is correlated with one another.

Native speaker : Student A $r = 0.39$ Student A : Student B $r = 0.54$
 Native speaker : Student B $r = 0.81$ Student A : Student C $r = 0.66$
 Native speaker : Student C $r = 0.75$ Student A : Student B $r = 0.79$

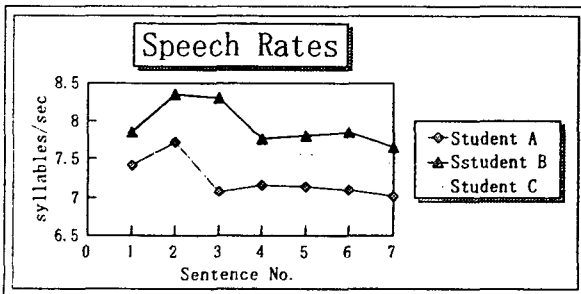
The average speech rates for the Japanese passage reading by the three learners are shown below. Student B read fastest in this case while Student C read fastest in the English passage reading.

Chart 2 Average Speech Rates: Japanese Passage (syllables/sec)

	Student A	Student B	Student C
AVERAGE	7.24	7.95	7.52
S. D.	0.25	0.27	0.35

The movement of the speech rates for the Japanese passage reading by the three learners is shown in Figure 2.

Figure 2 The Movement of Speech Rates: Japanese Passage



We can also see the similar movements of the speech rates among the three speakers. As the correlation coefficients between them are shown below, their speech rates are correlated with one another.

Student A : Student B $r=0.55$

Student A : Student C $r=0.41$

Student B : Student C $r=0.74$

The results described above suggest that the speech rate for each sentence is related to the number of syllables included in it. However, no relationship was found between the sentence speech rate and the number of syllables in the sentence. This contradicts the statement by Takefuta (1982) that Japanese speakers decrease the speech rate when they read a sentence with more than 6~8 syllables. Note that he does not refer to speech rates at the passage level. The following statement by Harris & Umeda (1974) may give us a hint to solve this problem: "Apparently the dependence of vowel duration on number of syllables is one of the dominating factors in the carrier phrase mode, but is a negligible factor in connected speech."

We cannot say anything conclusive here about the similarity of the speech rate movement between the native speaker and the learners. We might only point out that something beyond stress-timed/syllable-timed rhythm differences seems to be controlling their speech.

B. Pause

The frequency of pauses in each speech was counted, and the duration of the pauses was measured. Here we did not regard the short voiceless periods, which were often found in the Japanese learners' utterances, as pauses because they seemed to have been generated as the results of the learners' clumsiness of articulating English sounds. Chart 3 shows the frequency of pauses and their duration in the English passage reading.

Chart 3 Frequency and Average Duration of Pause : English Passage

		Native	Student A	Student B	Student C
Frequency of Pause	Sentence Final	9	9	9	9
	In Sentence	3	6	6	9
Duration of Pause	Sentence Final	732 ms	713 ms	775 ms	647 ms
	In Sentence	451 ms	618 ms	556 ms	554 ms
Pause/Passage Length		21.42 %	18.36 %	19.33 %	20.79 %

From Chart 3 it is clear that all the learners used more pauses than the native speaker, especially in sentences, and that they used much longer pauses in sentences than the native speaker did. In the sentence final position there was not a big difference among all the speakers except that Student C used shorter pauses.

Chart 4 shows the frequency of pauses and their duration in the Japanese passage reading by the three learners.

Chart 4 Frequency and Average Duration of Pause : Japanese Passage

		Student A	Student B	Student C
Frequency of Pause	Sentence Final	6	6	6
	In Sentence	12	10	18
Duration of Pause	Sentence Final	687 ms	780 ms	671 ms
	In Sentence	462 ms	344 ms	318 ms
Pause/Passage Length		18.87 %	17.68 %	19.68 %

If we compare Chart 3 and Chart 4 , we can see that the learners used much longer pauses when they read the English passage than when they read the Japanese one, especially in the mid-sentence position. This point coincides with the results reported by Takefuta (1982).

C. Intonation

Hearing the utterances by the native speaker and the learners, I felt that the learners spoke rather monotonously whereas the native speaker spoke expressively. This tendency can be seen in the F0 contours of their passage reading or more easily in Chart 5 which shows the pitch range used by each speaker.

Chart 5 Pitch Range : English Passage

	Native	Student A	Student B	Student C
High	217 Hz	139 Hz	190 Hz	163 Hz
Low	77 Hz	87 Hz	93 Hz	100 Hz
Range	140 Hz	52 Hz	97 Hz	63 Hz

As is shown here, the learners had narrower pitch ranges than the native speakers when they speak English. This point is pointed out in Nakaji (1993) and Takefuta (1982). Furthermore, if we look at Chart 6 which shows the pitch ranges of the learners' Japanese passage reading, we notice that they employed wider pitch ranges in their Japanese passage reading than in their English passage reading.

Chart 6 Pitch Range : Japanese Passage

	Student A	Student B	Student C
High	156 Hz	219 Hz	173 Hz
Low	94 Hz	92 Hz	102 Hz
Range	62 Hz	127 Hz	71 Hz

CONCLUDING REMARKS

We have seen that there is a similarity between the learners' English and the native speaker's English in the movement of speech rates and the ratio of pause length to the total length of the passage. The causes of these phonetic phenomena are left to be made clear in future. We have found that the pitch range differs from speaker to speaker, and that the pitch range difference is largest between the native speaker and the three learners. Another interesting fact about intonation is that the learners tend to use a narrower pitch range and relatively invariable intonation patterns when they speak English. This point may be true of other ESL learners other than Japanese.

Prosody plays a very important role in communications whether we use English or other languages. I hope the results obtained in this study will be applied to pronunciation teaching in the ESL scene.

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