Prosodic Factors for the Assessment of EFL Learners' Reading Proficiency

Kazuo Kanzaki*

0. Introduction

Prosody plays an important role in human communication as O'connor (1973) points out that the speaker's attitude is reflected in prosody such as pitch rages, tempo, loudness, and voice quality.

Past research on English spoken by Japanese EFL learners suggests that prosodic features are more important than segments in the judgment of its acceptability as English. For example, Ohyama et al. (1989) conducted a series of perception tests using the PARCOR analysis and synthesis technique to find out that prosody plays a more important role than the pronunciation of vowels and consonants, and that fundamental frequency is more important than duration and intensity in the judgment of English-like speech.

In this paper I will show that prosodic features such as pitch and duration are easy to analyze on a computer and are also useful when the teacher tries to evaluate a student's reading proficiency level.

1. Design of the Experiment

1. 1. Purpose of the Study

The purpose of this study is to show that prosodic factors such as speech rates, pitch ranges and pauses are useful in the assessment of EFL learners' reading proficiency.

＊　大阪電気通信大学総合情報学部メディア情報文化学科教授

1. 2. Subjects

Two groups of subjects were employed in the experiment; five college students majoring in engineering and five non-native (Japanese) college English teachers. I think the English teachers maintain an aspect of learners in the sense that they are not native speakers of English and still have a lot to learn about the English language including its pronunciation. In this study I assume the teachers are good readers and the students are poor ones.

1. 3. Method

The speech material which the subjects read is shown in the Appendix. Both the English and Japanese passages consist of ten sentences. The running word count for the English passage is 104.

All the subjects were asked to read the Japanese and English passages after practicing a few minutes. Their reading was recorded onto a computer hard disc. Pitch and duration were measured on the computer using a speech analysis program by showing waveforms, spectrograms and pitch (Fo) contours (sampling rate 16kHz; quantization 16bits).

2. Results and Discussion

The findings we gained through this experiment show that there are distinct differences between the readings by the teacher group and the student group with respect to prosodic features.

2.1. Length of Readings

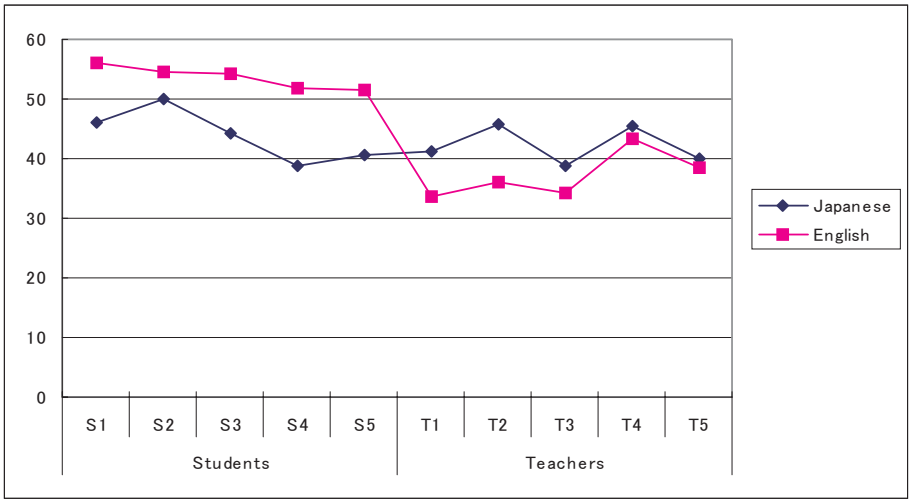
The time length that all the subjects took in their reading of the two different languages was measured. As is shown in the table and figure, the student group (S1-S5) took more time when they read the English passage than when they read the Japanese one. On the contrary the teacher group (T1-T5) took less time when they read English than when they read Japanese. The difference becomes clear if we look at the table and figure below.

Table 1: Length of Readings

	Students					Teachers				
	S1	S2	S3	S4	S5	T1	T2	T3	T4	T5
Japanese	46.1	50.1	44.2	38.9	40.7	41.3	45.8	38.9	45.6	40.1
English	56.0	54.5	54.2	51.9	51.5	33.6	36.1	34.2	43.4	38.6

sec

Figure 1



2. 2. Speech Rates

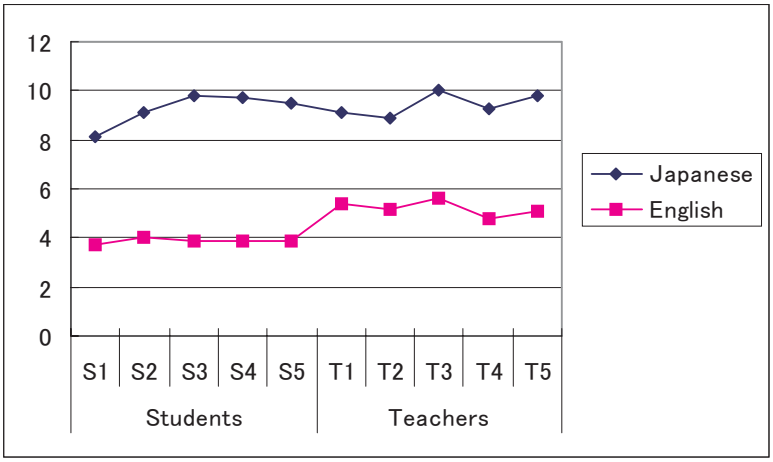
In the table and figure below S1, for example, read the Japanese passage at the rate of 8.1 morae per second, and the English one at the rate of 3.7 syllables per second. In the Japanese passage reading, we cannot see clear differences between the student group and the teacher group. However, in their readings of the English passage, the speech rate for the teacher group is much faster than that for the students group. This finding implies that a better reader reads faster than a poor reader.

Table 2: Speech Rates

	Students					Teachers				
	S1	S2	S3	S4	S5	T1	T2	T3	T4	T5
Japanese	8.1	9.1	9.8	9.7	9.5	9.1	8.9	10	9.3	9.8
English	3.7	4.0	3.9	3.9	3.9	5.4	5.2	5.6	4.8	5.1

Japanese: mora/sec
English: syllable/sec

Figure 2



2. 3. Pitch Ranges

As is shown in the table and figure below, all the teachers employed wider pitch ranges in their English passage reading than in their Japanese passage reading, while three out of five students (S1, S4, S5) used narrower pitch ranges in their English passage reading than in their Japanese passage reading. My past research (Kanzaki, 1996, 2001) and other research results show that students tend to use narrower pitch ranges when they read English than when they read Japanese. Tseng (1996) points out that Taiwanese learners of English use narrower pitch ranges in comparison with native English speakers, and that advanced learners use wider pitch ranges than beginners. In Yabuuchi (2001) Japanese subjects were divided into three groups (good, average and poor) based on ten native speakers' judgment of their reading performance. The results show that the good readers' Fo range, though not

so broad as the model readers', is almost constantly broader than that of the other Japanese subjects.

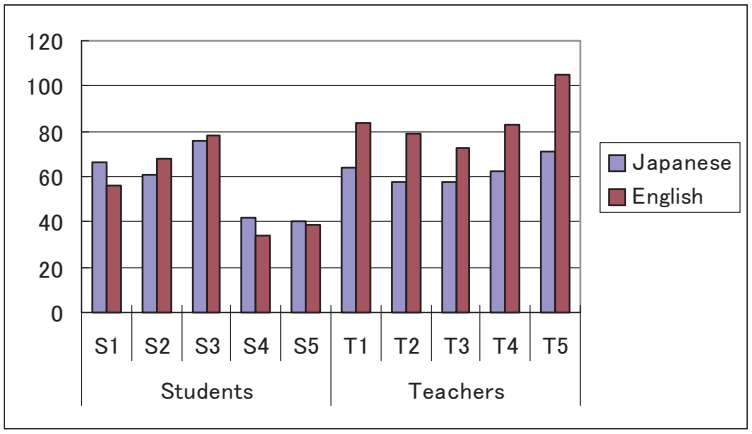
The above fact gives us an impression that poor readers tend to read English sentences monotonously or without expressiveness. So we might be able to say that the level of reading proficiency is reflected in pitch ranges.

Table 3: Pitch Ranges

	Students					Teachers				
	S1	S2	S3	S4	S5	T1	T2	T3	T4	T5
Japanese	66	61	76	42	40	64	58	58	62	71
English	56	68	78	34	39	84	79	73	83	105

Hertz

Figure 3



2. 4. Pauses

2. 4. 1. Ratio of Total Pause Length to the Reading Time

From the two tables below we cannot see any noticeable differences between the teacher and student groups although there seem to be individual differences among each group. Pausing seems to be unique to each reader.

It is said that pause length is the longest between sentences, and it becomes shorter after a momma, and it is the shortest in other positions. This tendency was confirmed both in the Japanese and English readings.

Table 4: Pause Length for Different Positions in the Japanese Reading

	between sentences	after commas	other positions
S1	542	318	221
S2	1286	477	425
S3	932	603	337
S4	449	298	200
S5	542	414	235
T1	830	179	165
T2	1028	374	192
T3	674	252	232
T4	878	393	221
T5	612	324	222

msec

Table 5: Pause Length for Different Positions in the English Reading

	between sentences	after commas	other positions
S1	832	583	200
S2	1348	657	192
S3	1011	763	194
S4	730	621	175
S5	751	359	156
T1	753	198	114
T2	774	294	173
T3	717	565	303
T4	763	512	179
T5	719	292	144

msec

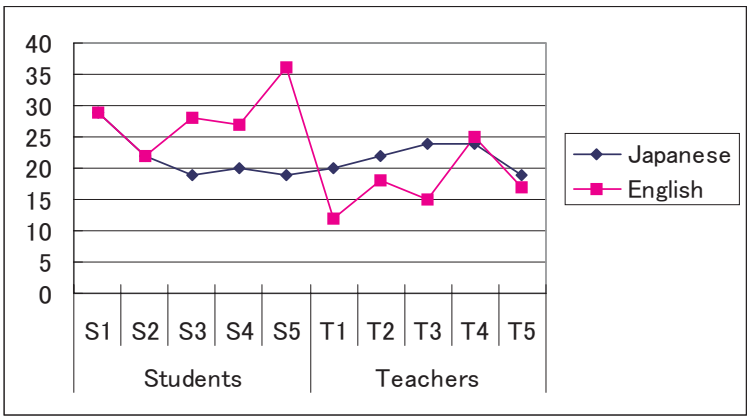
2. 4. 2. Total Number of Pauses

In the Japanese reading there is no big difference between the two groups about the total number of pauses. However, when we take a look at the English reading, we can see that the student group uses more pauses than the teacher group. It was also observed that all the subject teachers inserted pauses in proper positions, but that the students sometimes inserted pauses in grammatically inappropriate positions. This tendency is said to be observed among child native speakers of English according to Claly (1971). He says, "The variable of juncture or pausing was correlated with reading ability. The children who made few pauses were found to be the best readers."

Table 6: Number of Pauses

	Students					Teachers				
	S1	S2	S3	S4	S5	T1	T2	T3	T4	T5
Japanese	29	22	19	20	19	20	22	24	24	19
English	29	22	28	27	36	12	18	15	25	17

Figure 4



3. Conclusions

The results obtained in this study show that the faster speech rate, proper use of pauses, and employment of wider pitch rages in the English passage reading by the teacher group seem to contribute to the expressiveness and smoothness of their speech with comparison to the reading by the student group. I believe that these prosodic factors will give us a clear view of an EFL learner's level of reading proficiency and are useful for assessing it. In connection with this view let me point out that Ikeda (2002) shows the validity of judging learners language ability from their reading behavior, such as pause insertion, intonation and so on. She says that EFL learners' reading proficiency level is closely related to their general English ability.

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APPENDIX: Reading Material

The English Passage:

English is now used all over the world. It is often called the international language. It also plays an important part in the countries where there are many languages. Let's take India for example. India is so big a country, with a great many languages. For this reason, people in India need a means of communication throughout the country. Hindi is spoken especially in North India, but it is also used by other Indians to communicate. And English is used almost in the same way. In fact, English is one of the official languages in India. That is why so many Indians speak English.

The Japanese Passage:

英語は今や世界中で使われています。しばしば国際語と呼ばれています。また多くの言語が使われている国では、英語が重要な役割を果たしています。インドを例に見てみましょう。インドはとても大きな国で、非常に多くの言語があります。こうした理由から、インドの人々は国中で通じるコミュニケーションの手段を必要としているのです。ヒンズー語は特に北部インドで話されていますが、他の地方のインド人にもコミュニケーションのために使われています。そして英語がほぼ同じように使われています。実際、英語はインドにおける公用語の一つです。そういうわけでとても多くのインド人が英語を話すのです。