Rhythm Timing in *Japanese English*

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**ABSTRACT**

Due to the different sound systems of English and Japanese, obtaining a proper English speech rhythm is one of the greatest obstacles that Japanese face in their learning of English as a foreign language. Aims of this study are: 1) an explicit description of rhythm timing in English produced by four groups of Japanese subjects with different levels of English learning experiences in comparison with native speakers of English and 2) examinations and analyses of some underlying elements or factors which present obstacles for Japanese in obtaining proper English rhythm.

English speech rhythm at a sentence level is investigated, focusing on feet or ISls (interstress intervals) and their sound structure with the following criteria: a) proper use of function and content words and b) proper application of isochronous English rhythm in sentences. In this study all the factors are to be examined and analysed with respect to duration.

Crucial transferred factors from underlying Japanese sound systems in Japanese English as well as the degree of difficulty in production have been obtained through comparison with the target English expressions.

**1. INTRODUCTION**

There have been few experimental studies of English spoken by Japanese with regard to a comparison of foot duration between English spoken by native speakers of English and that spoken by Japanese learners. Some studies in this field have focused on pronunciation (Murakawa, 1981) or phonological comparisons between the two languages (Komoto, 1982) and also some on application of prosodic features in education (Mizuno, 1994).

Adams (1979) conducted research on the acquisition of English speech rhythm by 30 non-native English speakers. Tarui (1983) followed and applied the same methods to Japanese learners and also obtained statistically significant results.

**2. EXPERIMENT PROEDURE**

2.1. Aims

A comparison of timing factors of English produced by Japanese learners by measuring durations of feet, and of stressed and unstressed syllables within these feet.

2.2. Methods

Subjects were asked to record the English material discussed in 2.4, below. Recordings were done at the language laboratory at Akenohoshi Women’s Junior College and analyses of the recorded expressions were done through a computerized sound analysis package. Every subject was asked to practice the materials until they could read them fluently and to read them twice for recording. When they inserted a pause or made mistakes, they repeated those parts or the whole expressions. For each subject, one recorded expression has been selected for analyses after listening to all recorded expressions carefully.

2.3. Subjects

Five groups of speakers serve as subjects: a) Japanese boys and girls at the age of 10 – 12 without any experience in learning English [J01 – J10], b) Japanese learners of English with little experience (Beginners: high school students) [B01 - B10], c) Intermediate Japanese learners of English (6 adults and 4 college students) [M11 - M20], d) Advanced Japanese learners of English (3 lecturers and 7 instructors of English) [A21 - A30] and e) native speakers of English [N31-N40]. There were 10 subjects in each group. All of the subjects had normal speech and hearing according to self-report.

2.4. Linguistic materials and Measurement

The following part of *The North Wind and the Sun* has been recorded to cassette tapes for examination and analyses. The English expression has been divided into feet as follows:

They a-GREED that, the, ONE who FIRST suc-CEEd-ed in

\[
\text{f1} \quad \text{f2} \quad \text{f3} \quad \text{f4} \quad \text{f5} \quad \text{f6} \quad \text{f7} \quad \text{f8} \quad \text{f9} \quad \text{f10}
\]

MAK-ing the, TRAV-EL-er, TAKE his CLOAK OFF

\[
\text{f5} \quad \text{f6} \quad \text{f7} \quad \text{f8} \quad \text{f9} \quad \text{f10}
\]

should be con, -SID-ered STRONG,-er, than the, O-ther

\[
\text{f11} \quad \text{f12} \quad \text{f13} \quad \text{f14} \quad \text{f15}
\]

the NORTH WIND was, o-BLIGED to con, -FESS

\[
\text{f11} \quad \text{f12} \quad \text{f13} \quad \text{f14} \quad \text{f15}
\]

that, the, SUN was, STRONG,-er, of the, TWO

\[
\text{f13} \quad \text{f14} \quad \text{f15}
\]

The Japanese *Katakana* expression, which is almost equivalent to the following, has been used for Japanese subjects [J01 – J10] as they don’t read English.

zei agurido zatto za wan huu
faasuto sakusiidedo in meikingu
Measurement of feet and syllables has been done in the following way: A foot is measured from the beginning of a stressed syllable to that of the next stressed syllable belonging to the next foot. A syllable, which is composed of vowels with clustered consonants like \( C_1C_2C_3V_1C_4C_5 \), is measured from the beginning of a syllable to that of the next syllable. Duration of improper pauses or repeated places which might have some influence on forming proper rhythm has been measured and subtracted from durations of each unit. All material containing these pauses or repeated parts have been listened to by the writer with great care after the improper parts were deleted from the material and judged to sound normal.

3. RESULTS

3.1. Foot Duration

Fig. 1 shows average duration of feet; 2 syllables, 3 syllables, 4 syllables. A clear result can be seen in that A (advanced learners) and N (native speakers) show a similar distribution and so do B (beginners) and M (intermediates), leaving J (Japanese non-English speakers) outside their distributions. The longer duration of feet, the higher the number of syllables the feet have in all the groups, suggesting incomplete isochrony.

Fig. 2 shows average foot duration in real time among different groups and the line K shows what the duration of each phrase would be if it were composed of equal–length mora. Here, N and A also have similarities and so do M and B, therefore only J isolates itself from them. J shows, however, an outstanding feature: the distribution of foot is very similar to that of K as a whole.

Some feet such as f6 and f14 show very similar distribution among the groups, while some others like f1 and f12 display quite a different distribution among them.

3.3. Syllable Duration

Fig. 3a and Fig. 3b show duration of stressed and unstressed syllables with each experimental group, each of which is followed by a list of significant differences between each group of Japanese subjects and native speakers. The letter D indicates that there is significant difference with Tukey’s pairwise comparisons under ANOVA (General Linear Model).

Rather shorter durations have been found in some of the syllables, compared with that of native speakers: -fess, north, strong, -off and tra-. Some unstressed syllables produced by Japanese have quite the opposite problem – longer duration for unstressed syllables without any appropriate use of weak forms: that, was, should, to, be, of, that, his, and than.

As to the statistical result, J shows quite a number of differences with N, followed by B and M. A shows no significant difference with either stressed or unstressed syllables.

Discounting the differences mentioned above, Fig. 4 has been obtained for average duration of stressed and unstressed syllables over all the syllables in the material. Fig. 5 shows proportion of the duration (%) of unstressed syllables to stressed ones based on data on Fig. 4.

Japanese learners have much less difference between unstressed syllables and stressed ones, compared with native speakers. This tendency increases in the order of A, M, B, which tells us that phonetic realizations of unstressed syllables supported by a proper use of weak forms are crucial in the acquisition of proper English timing.

4. DISCUSSION

Duration of the foot alone is not adequate to judge English speech rhythm among Japanese speakers due to pseudo-isochrony, which reflects an almost equal duration for a (\( SUU \)) and b (\( USS \)). Ideal English speech rhythm (a) may have almost the same duration with (b) which is composed of shorter stressed syllables or longer unstressed syllables.
f1 -sid-ered
f2 one who
f3 first suc-
f14 sun was
f6 trav-el-ler
f4 sun was
f5 mak-ing-the
f13 -fess that the
f12 -bliged to con-
f7 take his cloak
f15 strong-er of
f8 off should be con-
f10 strong-er than th
f11 north wind was o-

Fig. 3a Durations (sec) of Stressed Syllables

Fig. 4 Duration (sec) of Stressed and Unstressed Syllables

Fig. 5 Ratio (%) of Unstressed Syllables to Stressed Syllables
Here lies the importance of foot structures. Some of the examples of longer stressed syllables are: -bled, -sid-, one, cloak, -greed. Some other examples of longer unstressed syllables are: was 1, be, -ered, that 2, his, than, was 2.

The main reason for these phenomena seems to be mora-based pronunciation. The process of obtaining a proper English timing is, therefore, that of losing some factors of the Japanese sound system; especially something which is idiosyncratic to the Japanese language.

5. SUMMARY AND FURTHER STUDY

We have examined duration in feet and syllables and the structure of feet composed of stressed and unstressed syllables with regard to proper use of weak and strong forms. Much more variability in foot duration in Japanese English has been observed, and improvement of English timing factors has been made in the order of B, M, A.

Most timing problems seem to stem from transfer of patterns from Japanese to English. As higher levels of English are achieved, fewer transferred phenomena from the Japanese sound system can be observed. As this study is limited only to timing patterns, further research should be conducted on other crucial factors in speech rhythm such as fundamental frequency and phonetic quality in order to achieve a comprehensive understanding of the topic.

6. REFERENCES