

## 〔論 文〕

## English Rhythm

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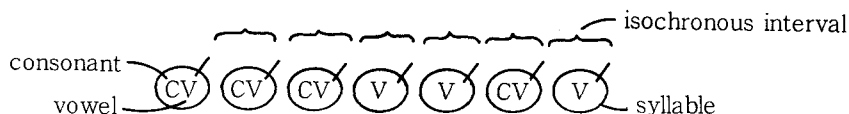
## §I. Stress-timed rhythm and syllable-timed rhythm

All physical movements in daily life have their own rhythm. Without rhythm, we cannot walk, run, dance, swim, and so on. And it goes without saying that rhythm plays an important function in linguistic behavior. Every language, it seems, has its own characteristic rhythm and, as might be supposed by the existence of many different types of languages in the world, the kinds of rhythmic structures found in every language would be supposed to be diversified. According to phoneticians, however, there are only two general types of speech rhythm in the languages of the world: the stress-timed rhythm and the syllable-timed one. The languages of the former class are based on the periodicity of stresses; and those of the latter, that of syllables.

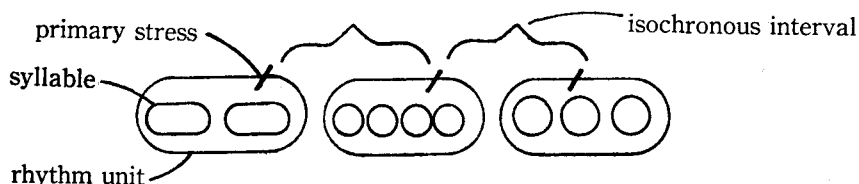
English is the language of stress-timed rhythm and Japanese is that of syllable-timed one. In this paper, speculation is made on how the pronunciation of English by Japanese students can be improved by making them recognize the difference of the rhythm pattern between Japanese and English and by teaching them several aspects or points, in the pronunciation of English, which reflect the characteristics of stress-timed rhythm of English.

Let us begin with the explanation of the rhythm of English and that of Japanese. The syllable-timed rhythm of Japanese has simpler structure than the stress-timed rhythm of English. The syllable structure itself of Japanese is rather simple. Roughly speaking, it consists of only two types: a type formed of one consonant plus one vowel, and another type formed of only one vowel. The syllable-timed rhythm, as stated in the first paragraph, is based on the periodicity of syllables; periodicity here means the serial recurrence of isochronous intervals; and so, each of the two types of Japanese syllable structures creates each isochronous pulse in an utterance. It is possible to paraphrase the description of this rhythmic structure as: the periodicity of pulses which synchronize with the even time spacing of syllables;<sup>1)</sup> or, the syllables spoken at more or less uni-

formly recurrent time intervals.<sup>2)</sup> The rhythmic structure of Japanese may be illustrated as follows:



The stress-timed rhythm, on the other hand, is based on the periodicity of uniformly spaced stresses;<sup>3)</sup> or in other words, the serial recurrence of more or less isochronous intervals marked off by stressed syllables.<sup>4)</sup> For better understanding it is necessary to introduce the idea of "rhythm units" now, though some more reference with concrete examples will be made later in section II. A rhythm unit is a unit which is composed of a gathering of several syllables with one primary stress put on one of them, and by which, it is considered, the structure of English speech rhythm is formed. The description of the stress-timed rhythm may be paraphrased again as: the serial and isochronous recurrence of primarily stressed syllables in rhythm units. The structure of stress-timed rhythm of English can be illustrated as follows:



In stress-timed rhythm languages, sounds of each constituent syllables are modified to a great extent and the duration of a given syllable varies according to the context. Though the number of syllables in each rhythm unit may vary considerably, the impression of isochronous intervals is maintained as a result of qualitative and quantitative adjustment of the unstressed syllables in relation to the stressed one in each rhythm unit; and so that, the actual number of syllables in a rhythm unit cannot be the real index of the duration of intervals. While, in syllable-timed rhythm languages, there is no such modification of sounds, their durations are invariable, and consequently the whole duration of an utterance is proportional to the total number of syllables it contains.<sup>5)</sup>

The variability of syllable duration of stress-timed rhythm makes the rhythm of English so hard to acquire for non-native speakers of English. They fail to recognize the significance of the timing of syllables, and as a result, produce the anomalous rhythm with superfluous and random placement of stresses and pauses, which seriously impairs the total intelligibility of their utterance.

The variation of sounds in stress-timed languages becomes at the same time the cause of several phenomena which are peculiar to English and would give some hints to Japanese students for recognizing and acquiring the characteristic rhythm structure of English, and it is on those phenomena that discussions in section II are to be made.

Kenneth L. Pike in the following quotation makes an explanation on the structure of English rhythm units, together with a description on how several sounds in rhythm units are modified and some of the resultant phenomena occurs:

The tendency towards uniform spacing of stresses in material which has uneven numbers of syllables within its rhythmic groups can be achieved only by destroying any possibility of even time spacing of syllables. Since the rhythm units have different numbers of syllables, but a similar time value, the syllables of the longer ones are crushed together, and pronounced very rapidly, in order to get them pronounced at all, within that time limitation. This rhythmic crushing of syllables into short time limits is partly responsible for many abbreviations—in which syllables may be omitted entirely—and the obscuring of vowels; it implies, also, that English syllables are of different lengths, with their length of utterance controlled not only by the lexical phonetic characteristics of their sounds but also by the accident of the number of syllables in the particular rhythmic unit which they happen to belong at that moment.<sup>6)</sup>

Pike uses the term “rhythm group” for the meaning of rhythm unit. They are quite the same conception and, by the way, there are more different terminologies by different scholars for this same idea: C. C. Fries uses the term rhythm group; Yao Shen, intonation block; G. L. Trager and H. L. Smith, phonemic clause; and H. E. Palmer, tone-group.

Stress-timed rhythm and syllable-timed rhythm are the terms first used and popularized by Pike. The same concept had been conceived, for example, by André Classe in *The Rhythm of English Prose* (1939). He used the term “isochronism” for stress-timed rhythm, and “isosyllabism” for syllable-timed rhythm, where “iso-” is a prefix meaning “same” or “same length of”, and “chrono-” means “time” or “period”.

Languages of stress-timed rhythm are: English, Persian, Hebrew, Modern Greek, Mandarin Chinese, Scots Gaelic, and Scandinavian; those of syllable-timed one are: French, Italian, Spanish, Urdu, Hindi, Finnish, Hungarian, and Cantonese. The two types of speech rhythm are mutually exclusive; however, there is one exception—Czech, in which, according to Daneš, the rhythm units are both syllable-timed and stress-timed.<sup>7)</sup> It is noteworthy that the earliest speech of all language learners and the native languages spoken by foreign people are characterised by syllable-timed rhythm. According to Aber-

crombie, syllable-timed rhythm is a characteristic feature of the earliest speech of all language learners, and stress-timing, which appears a little later in the child's language development, is an extra feature which has to be learnt by speakers of stress-timed rhythm languages.<sup>8)</sup>

## §II. Phenomena affected by rhythm in English pronunciation

In K. L. Pike's statement on English rhythm unit introduced on p. 3, he talked about "abbreviations" and "obscuring of vowels". These are two of the phenomena typical to English and caused by its stress-timed rhythm structure. In this section eight discussions are made on those phenomena and matters concerning to them: 1. abbreviation (contraction, contracted form); 2. obscuration of unstressed vowels; 3. rhythm unit; 4. rhythmic stress; 5. strong form and weak form; 6. pause; 7. sense group; 8. traditional rhyme.

1. Contraction is a phenomenon caused by the modification or omission of some weak syllables or sounds to keep good balance for good timing of rhythm. Compare the following standard forms and their contracted forms:

standard form: What do you want to do?

contracted form: Wha di ya wana do?



standard form: What are you doing?

contracted forms: What er ya doing?



Wha di ya doin'?



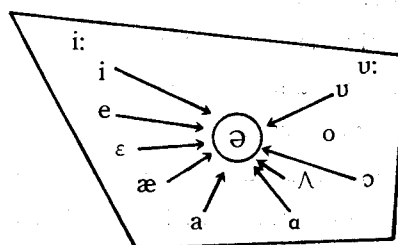
What cha doin'?



Some kind of musical rhythm as shown above by musical notes might be projected to each contracted form. Contracted forms, though sometimes and in some situations regarded to be impolite, need not entirely be prohibited to use in class rooms because they have a lot of English rhythm reflected to themselves and might well be taught to give students some idea or sense for learning good English rhythm, though it is not good and might be dangerous in some cases to teach them without careful consideration on their semantic aspects to those students who have not mastered standard form yet. My idea

is like this—a student should start from the standard form “What do you want to do”, then he may be taught the form “Wha di ya wana do?”, he will acquire some sense and knowledge of the rhythm of this sentence by pronouncing its contracted form, and then again he will pronounce the sentence “What do you want to do?” with better rhythm. Especially to improve the students’ ability of hearing English, contracted forms are effective and a lot will be expected from them.

2. Another phenomenon caused by stress-timed rhythm is the obscuration of vowels. There are stressed syllables and unstressed syllables in English utterances and as a matter of course more prominence is put on stressed syllables; that is, they have stronger stress, higher pitch, and lengthening of sounds. On unstressed syllables, on the other hand, the obscuration of sounds happen; that is, not only stress become weaker, pitch lower, and length shorter, but also vowels become centralized (neutralized). As illustrated in the diagram below, there is in English vowel system a central vowel, which is pronounced with the top of the tongue in the central and mid position, and symbolized by the phonetic alphabet called schwa:[ə].<sup>9)</sup>



Centralization of vowels is a phenomenon in which vowels when they lose their stress become to be changed to this centralized sound. For example, the sound of “a” in “válido” is [æ], but it become [ə] in “validity” where there is not a primary stress on “a”. In the same way, the sound of “o” in “prótest” (noun) is [ou], but [ə] in “protést” (verb). “There”, when pronounced individually, has a diphthong in it and can be shown by phonetic symbols [ðɛə]; however, it may be shown as [ðə], in a sentence like, “There isn’t any.”

The degree of obscuration is parallel to the strength of stress: the weaker the stress becomes, the obscurer the vowel becomes. There is an inevitable relationship between the centralized vowel of English and the stress-timed rhythm of English as they are a coexistent phenomenon. Pike says it is easier and better to practise these murmured vowels in sentence rhythms than to try to pronounce them individually. Central vowels are difficult to pronounce especially for those whose native language is syllable-timed one.

3. It was explained on p. 2 that English speech forms a rhythm unit, composed

of a gathering of several syllables with one primary stress put on one of them. Examples can be given as follows:

in the póst office (one rhythm unit)

Where's the bóy ? (one rhythm unit)

The proféssor téaches the lésson. (three rhythm unit)

As explained before, each primary stress in each rhythm unit tends to appear in isochronous intervals; and consequently, the addition of unstressed syllables hardly affects the original rhythm.

The téacher cáme.

The téacher is the one who cáme.

Bóys éat lúunch.

The bóys will éat their lúunch.

The bóys will be éating their lúunch.

Sentences exemplified above show how the original rhythms are not changed by the addition of unstressed words. It seems difficult for Japanese students to pronounce the long addition of unstressed words like "is the one who" smoothly without unnecessary prologation which would collapse the original sentence rhythm. The original sentences (The teacher came Boys eat lunch) and the sentences stuffed with unstressed words, if measured by some accoustic instrument, would not show quite the same length of time and pattern of rhythm; but still, students should be recommended to try to read both the original and the stuffed sentences in the same length of time at least for practice.

4. In the case of disyllabic and double stressed words—words with two stressed syllables, the position of the stress is often determined, being influenced by the tendency to keep good balance for isochronous timing of rhythm. This phenomenon is called "rhythmic stress". Usually, one of the two syllables, preceded or succeeded by other stressed word, loses its stress, as shown by the examples below, where "fifteen" and "unknown" are disyllabic words and, for example, the word "fifteen", when preceded by the stressed word "júst", tends to have its stress put on the second syllable and, when succeeded by "yéars", on the first syllable.

júst fiftéen                      quíte unknoẃn

fifteen yéars                      an únknown lánd

5. Function words in English—i. e., auxiliary verbs, pronouns, prepositions, conjunctions, articles, and so on, when pronounced individually, take strong form; when pronounced in a sentence and without any special emphasis or sentence stress on them, take weak form and both their vowels and consonants are modified to a great extent. In the

following examples, the phonetic symbols show how some function words have their weak forms in a sentence. Strong forms for each weak form are also shown below respectively for comparison, and some noticeable points are—the loss of “h” sound in the weak form of “him” and “his”; the loss of aspiration and the sonorisation (voicing) in the “k” sound of “can” and the “t” sound of “to”; and, the centralization of vowels.

Give him his coat.

gɪv   ɪm   ɪz   kəʊt  
       ↑    ↑  
       hɪm   hɪz

He can do it.

hi   kn   dú:   ɪt  
   ↑    ↑  
 hi:   kən  
       ↑  
       kæn

We go to school.

wɪ   ɡəʊ   tə   skú:l  
   ↑        ↑  
 wi:      tu  
           ↑  
           tu:

Two and two are four.

tù:   ən   tù:   ə   fó:  
       ↑        ↑  
       ænd      ɑ:  
       ↑  
       ænd

For practising those weak forms, it is recommended, a succession of several words with weak forms should be pronounced at a breath as if they were one word. Pike says again as he said about the practice of murmured vowels that the easier way for acquiring the distinction between strong form and weak form is to practise it in sentence rhythms than in individual words.<sup>10)</sup>

6. It is difficult for non-native speakers of English to maintain the good rhythm of English in such a case when they cannot find appropriate words and have to abruptly break the speech by some pause. In such a case, native speakers of English would fill the pause with some sort of physical movement of paralinguistic expression for the time the required word being recalled. The failure to use the pause correctly is one of the causes of rhythm anomalies by non-native speakers. Native speakers are rarely aware of it yet they intuitively use it. The problem left for phoneticians is to make clear what this physical movement is and how to acquire it.

7. Semantic aspects of language should not be forgotten. It often happens to non-native speakers of English, even those who can speak English almost as well as native speakers when they use well-mastered expressions, that they suddenly fail to speak in a well balanced rhythm when they have to use expressions of which meaning is not well understood. In the field of foreign language learning, activities based on the timing and organization of the sense group are crucial for the acquisition of a native-like English speech rhythm.<sup>11)</sup>

There is not necessarily a complete accordance between rhythm and sense group; sometimes there will be a discrepancy between them. Perhaps it is because the relation

between rhythm and meaning is indirect in that meaning and form (sound) are, borrowing Jespersen's words<sup>12)</sup>, the two Janus-like aspects of language and that what rhythm is directly concerned with is the form of language as long as rhythm is a configurative phenomenon. Here the problem left is not limited to phoneticians, but some cooperation by psychological and philosophical studies are also required.

8. Stress patterning and pause placement play a major role in the production of English speech rhythm, and the command of rhythm can be said to be the key to the mastery of spoken language. To acquire such a sense of rhythm, such auditory forms as nursery rhymes would be helpful. Many native speakers would have acquired the rhythm of English by being stimulated since their childhood by the rhythms of such traditional rhymes. And also, there may be some reflections or echoes of the rhythm of nursery rhymes in some daily expressions. The following examples with musical notes show how some daily expressions correspond to the rhythmical framework of nursery rhymes.<sup>13)</sup>

The image displays several English phrases with musical notation above them, illustrating their rhythmic structure. The notation uses a simplified system of notes and rests to represent the timing and stress of the words.

Left column:

- One, two  
Buckle my shoe,  
Three, four,  
Knock at the door,
- Humpty Dumpty sat on a wall,  
Humpty Dumpty had a great fall.

Right column:

- Wait there!  
Bring round the car.  
Come in!  
Where have you been?  
Coffee or tea,  
Which will you have?
- If she's leaving,  
Sixteen students  
When you get there,  
I can't be there,
- please let me know;  
still want a place.  
'see all you can;  
much before ten.

Many of the idioms and popular phrases would also be helpful for the study of English rhythm, because they have only been evolved and have remained because their rhythmic structure made them striking and easily remembered.

As stated before concerning to the centralization of vowels and strong forms and weak forms, one of the causes of non-native speakers' anomalous rhythm may be attributed to the fact that they have studied the principles of stress placement only at lexical level, and not at sentence level.

For deciding what sentences to choose as materials for teaching rhythms at sentence level, such ones as typical English rhythmic structure is projected to may be recommended.



In every language, verse forms, especially traditional rhymes, represent the typical rhythmic structure of the language. Borrowing the terms of transformational grammars, these might be called the deep structure of speech rhythm, as compared to the surface structure of the rhythm presented by prose styles.

#### **Appendix: Doubt about the definition of stress and the isochronism as a physical fact**

Throughout the paper, stress and isochronism are treated as two of the most important factors in considering the English rhythm structure. According to some experimental researches, however, there is some doubt about the definition of stress maintained hitherto and the idea of isochronism as a physical fact. In this appendant section, several statements by phoneticians are introduced about these two problems.

Although the relationship between stress and rhythm has been recognized for centuries, some of the ideas about the function of stress as marker of rhythmic impulse should be altered according to recent experimental researches on stress.

Our conceptions about stress seem to be based on those by structural linguists. The following quotations are the definitions of stress by structural linguists: "the degree of force with which a sound or syllable is uttered, .....a subjective action, [involving] a strong 'push' from the chest wall [which] gives the objective impression of loudness" (Daniel Jones);<sup>14)</sup> "intensity or loudness [consisting] in greater amplitude of sound waves" (Leonard Bloomfield);<sup>15)</sup> "differences in loudness..... found to be consistent in [the] relative strength [of the vowels]" (Trager and Smith);<sup>16)</sup> "an increase in tension and energy in the whole of the vocal apparatus" (Bloch and Trager).<sup>17)</sup>

It is often stated, by structural linguists on the idea of stress, that when we pronounce stressed vowels we have to put strength to our breast and stomach to produce air pressure to the sound and that when we pronounce unstressed vowels we should not put special strength to our vocal organs. However, it is found by recent experimental researches that the difference between stressed vowels and unstressed vowels is not based on the strength of sound.

Ilse Lehiste considers: that intensity (strength) plays an ambiguous part in the perception of stress; that, on the other hand, frequency (pitch) is intimately connected with stress; and that, duration (length) has possibility to be considered as a general cue to stress.<sup>18)</sup>

Corinne Adams concluded: that despite fairly widespread acceptance of the view that stress is associated with increased respiratory muscular activity, [he] could find no evidence of increased internal intercostal muscle activity synchronous with the utterance of

stressed syllables in connected speech, and must therefore reject a physiological definition of stress based on the expiratory muscular activity of the speaker.<sup>19)</sup>

There remains many unsolved questions as to what kind of physical movement is required for producing the proper stress as produced by native speakers. The contradiction between the structural linguists' definition of stress and the experimental researches on stress is very serious, especially for those who teach English as a foreign language.

Now, the second problem is about isochronism. Isochronism as a main factor to construct the English rhythm structure is unreliable in that it is merely an abstract conception rather than a concrete physical fact ascertained by some experimental researches.

Sonnenschein, as a result of a kymographic investigation of syllable duration rather than the mere auditory observations, argued that "there is no generally accepted system of English syllable-measurement in existence,"<sup>20)</sup> and that in all manifestations of rhythm what we are really concerned with is the psychological (i.e., the impression made by the physical fact upon the mind through the sense organs) rather than the physical fact.

Yao Schen and G. G. Peterson also concluded on the basis of spectrographic investigation: "We did not find isochronism in our limited data and therefore cannot say that there is isochronism in English."<sup>21)</sup> Their speculation on isochronism as a psychological fact is rather unique. They observe that isochronism is a phonetic rather than a phonemic feature, and that it is not in contrast with any other feature of English but rather "in contrast with the isosyllabism of a foreign language."<sup>22)</sup> They are not against the use of the techniques based on isochronism for teaching English as a foreign language, saying that "the description of a language and the way to teach it as a foreign language are not always one and the same thing."<sup>23)</sup>

#### notes

- 1) Corinne Adams, *English Speech Rhythm and the Foreign Learner* (Mouton Publishers, 1979), p. 86.
- 2) *ibid.*, p. 87.
- 3) *ibid.*, p. 87.
- 4) *ibid.*, p. 87.
- 5) *ibid.*, p. 87.
- 6) Kenneth L. Pike, *The Intonation of American English* (Ann Arbor: University of Michigan Press, 1945), p. 34.
- 7) Frantisek Daneš, "Sentence intonation in present-day Standard Czech", p. 2. Quoted by C. Adams, *op. cit.*, p. 86.
- 8) David Abercrombie, tutorial (Edinburgh University, 1971). Quoted by C. Adams, *op. cit.*, p. 86.
- 9) Strictly speaking, there is a slight variety in central vowel. For example, the central vowel which is supposed to be changed and derived from the vowel [e] is a little akin to [e] sound. Each central vowel, though described by the same symbol, has the slight similarity to each vowel

it is derived from. There is a problem in giving each central vowel the same phonetic symbol. The cerebral system of recognizing central vowel might be supposed to be different from that of other cardinal vowels.

- 10) Kenneth L. Pike, *Phonemics: A Technique for Reducing Language to Writing* (Ann Arbor: Univ. of Michigan Press, 1948), p. 13.
- 11) C. Adams, *op. cit.*, p. 193.
- 12) Otto Jespersen, *The Philosophy of Grammar* (London: Allen, 1924), p. 56.
- 13) C. Adams, *op. cit.*, p. 16.
- 14) Daniel Jones, *An Outline of English Phonetics* (Cambridge: Heffer, 1918, 1960<sup>9</sup>), p. 245. Quoted by C. Adams, *op. cit.*, p. 58.
- 15) Leonard Bloomfield, *Language* (New York: Holt, 1933), p. 110. Quoted by C. Adams, *op. cit.*, p. 58.
- 16) George L. Trager and Henry Lee Smith, *An Outline of English Structure* (Washington: American Council of Learned Societies, 1957), p. 35. Quoted by C. Adams, *op. cit.*, p. 59.
- 17) B. Bloch and G. L. Trager, *Outline of Linguistic Analysis* (Baltimore: Special Publication of the Linguistic Society of America, 1942), p. 35. Quoted by C. Adams, *op. cit.*, p. 59.
- 18) Ilse Lehisté, *Suprasegmentals* (The M. I. T. Press, 1970), p. 125.
- 19) C. Adams, *op. cit.*, p. 193.
- 20) E. A. Sonnenschein, *What is Rhythm?* (Oxford: Blackwell, 1925), p. iv.
- 21) Yao Shen and Giles G. Peterson, "Isochronism in English", *Studies in Linguistics* (New York: University of Buffalo, 1962), p. 34.
- 22) *ibid.*, p. 6. Quoted by C. Adams, *op. cit.*, p. 50.
- 23) *ibid.*, p. 34. Quoted by C. Adams, *op. cit.*, p. 50.