

Rhythmic aspects of minor phrase formation in Japanese sentences

This study aims to explore the effect of phrase size (the number of moras) on minor phrase formation in left-branching Japanese sentences from a rhythmic perspective. Kubozono (1993) reports that in uniformly left-branching phrases consisting of four accented words, “the third minor phrase is realized as high as (or even higher than) the second minor phrase” and claims that the principle of rhythmic alternation (cf. Selkirk, 1984) underlies this phenomenon. He also argues that this “rhythmic (F0) boost” occurs regardless of the length of the phrases exclusively in left-branching phrases made up of four (not three) phrases. Selkirk et al. (2004) report that in Japanese sentences the degree of initial pitch rise of minor phrases are affected by the length of the phrases.

In order to examine in more detail the effect of phrase length on minor phrase formation in Japanese sentences, two sets of the experimental materials were prepared for this study: Left-branching sentences made up of either three or four phrases as presented in (1) and (2).

(1) Left-branching sentences made up of three phrases

{ { N1-no N2-o } Verb }

(2) Left-branching sentences made up of four phrases

{ { N1-no N2-no } N3-o } Verb }

The second nouns (N2) are seven tree names with accentual pitch falls, ranging from one to seven moras in length [e.g., *matsu* (pine tree); *momiji* (maple tree)]. The third nouns (N3) are two initially-accented words *ne'* (root) and *a'oba* (green leaves). Both N1-no and Verb are three-mora initially-accented phrases. Four Japanese females who speak Tokyo Japanese read the above two types of sentences twice each in random orders. Recordings were analyzed with Sugi Speech Analyzer and the F0 contour and spectrogram of each utterance were extracted. The maximum and minimum F0 values of each phrase were measured for all the sentences.

The results show that in the sentences consisting of three phrases (1), an extra F0 boost is observed in the second phrase (N2-no), forming a distinctive minor phrase. The third phrase (Verb), by contrast, tends to be intonationally merged with N2-no. In sentences consisting of four phrases (2), there is a strong tendency to divide the four components into two distinctive minor phrases or tonal units [(N1-no + N2-no) (N3-o + Verb)]. In each tonal unit, the following phrase either shows (total) downstep or is totally merged with the preceding phrase. When N2's length exceeds four or five moras, however, N2 begins to form an independent minor phrase of its own with the initial pitch rise as high as or even higher than that of N1.

These results suggest that in left-branching Japanese sentences phrases tend to group together into a larger tonal (rhythmic) unit of about five to ten moras.

References

- Kubozono, H. (1993) *Organization of Japanese Prosody*. Kurosio Publishers
- Selkirk, E.; Shinya, T.; Kawahara, S. (2004) Phonological and Phonetic Effects of Minor Phrase Length on f0 in Japanese. *In Proceedings of Speech Prosody 2004, Nara, Japan*.