The effect of pause insertion on the temporal organization of connected utterances

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Introduction:

The present paper examines the effect of pause insertion on the temporal organization of connected utterances, viz., paragraphs consisting of multiple sentences and pauses. Specifically, it aims to clarify the effect of intra-sentential pauses on the duration of inter-sentential pauses, as well as on the durational properties of the sentences.

There are a substantial number of studies on pause and its effect on utterance, mostly on English (e.g., Klatt 1976, Lyberg 1979, Crystal and House 1988, and 1990), but also on other languages (e.g., Kohler 1983 on German, and Berkovits 1991 on Hebrew). Fant et al. (2003) investigated the pause duration of a number of Swedish speakers and found that, while inter-sentential pauses were of similar lengths, the duration of intra-sentential pauses varied considerably from speaker to speaker. Fujisaki & Omura (1971) examined the statistical distribution of the duration of pauses in the reading of Japanese texts. They found two prominent peaks for syntactic pauses, one around 500 ms that they interpreted as 'respiratory', and the other around 200 ms that they interpreted as 'non-respiratory'. The durational distribution of the latter was great, suggesting that these shorter pauses were strongly influenced by such factors as speech rate and training.

Previous studies by the present author has shown that when Japanese speakers produced utterances with an intra-sentential pause of two contrasting lengths, 'normal' and 'short' categorized according to their own criterion, the pre-pausal lengthening before a normal-length pause was greater than that before a short pause (Kakita 2006, 2008). The author has also investigated the effect of sentence-medial and sentence-final pauses on pre-pausal utterances, using short Japanese sentences (Kakita 2009). The results showed that the two types of pauses differed in the extent of its influence on the pre-pausal utterance portion. That is, sentence-medial pauses lengthened only the immediately pre-pausal segment, whereas sentence-final pauses lengthened additional segments further away from the pause.

The present study focuses its attention on sentence-medial and sentence-final pauses, too, but in a new setting, i.e., connected utterances. It tries to elucidate the nature of the interaction between the two kinds of pauses and their effect on the durational properties of utterances

Method:

Two types of paragraphs were prepared as recording material, a 'list' and a 'story'. The former consisted of five sentences in the form of a 'list', i.e., 'The first person was ***.', 'The second person was *****.', and so on. The latter consisted of five sentences in the form of a 'story', i.e., 'Scott is a foreign student. He is from ... He studies ...', and so on.
 Native speakers of Japanese read the two types of paragraphs in two different ways, i.e., with and without an intra-sentential pause in the middle of each sentence. The two paragraphs were read ten times each.

The utterances were recorded directly into a personal computer, using speech software WaveSurfer (Royal Institute of Technology, Sweden). Measurements were made by referring to raw speech waves as well as sound spectrograms of the recorded utterances.

Results:

The results pertaining to two speakers will be presented below.

The effect of intra-sentential pause insertion on the duration of inter-sentential pauses was found to be speaker-dependent. In one speaker, the increase in paragraph duration due to the insertion of intra-sentential pauses was counter-balanced by the decrease in the duration of inter-sentential pauses. In the other speaker, the insertion of intra-sentential pauses was accompanied by the increase in the duration of inter-sentential pauses. In this manner, each speaker employed different strategies for utterance organization. Interestingly, however, each speaker used the same strategy consistently for both types of paragraphs, the list and the story.

As for utterance portions, the insertion of intra-sentential pauses was accompanied by the lengthening of the immediately pre-pausal syllable, as has been observed in previous studies (Kakita 2003a, 2003b). It also exerted some influence on the utterance portions following the intra-sentential pauses, either by increasing or decreasing the duration, but the effect was neither marked nor consistent.

The analysis of the recordings of additional speakers is under way.

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