

Some cognitive factors behind vowel lengthening in spontaneous Japanese: A corpus-based study

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Vowel length in continuous speech is determined by various factors. Previous studies in phonetic science and speech synthesis have identified the following factors, among others, that may affect the duration of a vowel: i) the inherent duration of the vowel, ii) the compensatory effect of the surrounding consonants, iii) the syntactic category of the word, iv) the position of the vowel in the word, the prosodic phrase, and the utterance, and v) the overall speech rate of the speaker. When we turn our attention to spontaneous discourse, however, we find other higher-level factors triggering the lengthening of vowels. Since in spontaneous discourse speakers need extra time to plan what to say next and to formulate it in an appropriate construction, they may suspend the ongoing utterance, stretching the speech segment being articulated, when they experience a severe cognitive load.

In this talk, I will investigate vowel lengthening in spontaneous Japanese, based on a quantitative analysis of a large-scale corpus. In particular, I focus on three locations at which vowel lengthening frequently occurs: the final vowel i) of an utterance preface (filler or discourse marker) such as *e* and *de*, ii) at the end of a preceding utterance, and iii) of a topic phrase marked by the particle *wa*. The following example illustrates these three sites:

... suru-n-desu-keredo-mo: (1.1) e: (0.3) saiaku-na-no-wa: zicetai-ni ...
do-N-POL-yet um worse-COP-N-TOP SDF-DAT
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Preceding utterance Preface Topic

A series of our studies have shown that the durations of vowels at these locations are positively correlated with the length of the following utterance (*zicetai-ni ...*) and that they are also affected by the strength of connectivity between the preceding and the current utterances. By using novel statistical modeling and incorporating the above mentioned lower-level factors into the models, I will demonstrate how vowel lengthening in spontaneous Japanese is governed by cognitive factors, more precisely, by planning of utterance and discourse.