

# Effects of linguistic experience in coarticulation

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A frequently replicated finding is that frequency of use affects the phonetic shape of words. Frequent words tend to have less segments and shorter acoustic durations than rare words [1, 2]. Besides temporal effects, spectral effects have also been shown. In English, for example, frequent words contain more centralized vowels than rare words [3, 4, 5]. These effects are interpreted as phonetic reduction. Two explanations have been proposed so far:

a) According to the “Principle of Least Action”, speakers reduce frequent words in order to save articulatory effort [1].

b) According to the “Smooth Signal Redundancy Hypothesis”, speakers reduce frequent words in order to decrease their information density [3].

So far, these effects have been investigated using acoustic measurements of the speech signal. One shortcoming of these measurements is that they are restricted, at least at the spectral level, to single time points, ignoring changes in the speech signal as a function of time and thus the fine detail in the speech signal.

In the talk, I will present the results of the studies we performed in the course of the last three years. We investigated the effects of frequency of use in articulation in German and English vowels in monosyllabic and disyllabic words. We analyzed articulation by means of Generalized Additive Mixed-Models [8]. In contrast to linear regression, these enable us to investigate non-linear behavior such as tongue movements as a function of time.

We found that frequency of use does not simply reduce the vowel but introduces varying phonetic detail, especially depending on the morphological context [6, 7].

In contrast to the previous explanations we regard these effects to indicate that higher frequency of occurrence enhances the speaker's capability to plan and produce words.

## **References**

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