

## **Production, perception, sound change and the lexicon: evidence from consonant clusters.**

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The present paper is concerned with the relative stability of consonants in syllable-initial compared with syllable-final position. The data that is to be presented is taken from electropalatographic and kinematic analyses of singleton and double consonants from various languages with different types of phonological systems.

The background to this research is the evidence, mostly from English, that consonants in syllable-initial position tend to be inherently less variable and less lenited than their counterparts in syllable-final position [1], a difference which can also be exploited in various languages for marking the relative strength of the left-edge of a prosodic boundary [2]. Other articulatory experiments have shown that syllable-final consonants are often more overlapped by syllable-initial consonants than the other way round [3] and there is synchronic evidence from a number of languages showing that the assimilation of place of articulation, when it occurs, is mostly anticipatory (from syllable-initial to syllable-final consonants) but rarely perseverative (from final to initial) [4]. Compatibly, perception experiments have shown that in heterorganic consonant clusters, the identification of the place of articulation of a syllable-final consonant is more likely to be masked by an initial consonant, an effect which occurs even when a consonant cluster is played backwards [5]. These articulatory and perceptual data are argued by some to be related to a number of sound changes involving the strengthening of initial consonants, the weakening of final consonants, and the diachronic assimilation of final to initial place of articulation.

In order to investigate the extent to which these synchronic and diachronic changes originate from universal articulatory and auditory properties, experimental data of consonants in different syllable positions are presented from various languages. The results show that there is some evidence from an electropalatographic analysis of German for the greater instability of syllable-final consonants, although there was considerable variation across speakers. Electropalatographic data from a single Polish speaker producing fricative clusters spanning a word-boundary showed that both the initial and final consonant influence each other, but there was no suggestion that the influence of the syllable-initial on the syllable-final is greater than the other way round.

We next consider some electropalatographic data analysed in Stephenson & Harrington [6] in the production of word blends in English and Japanese. The materials were constructed in such a way that an assimilation site was created in the resulting blend. Following Otake & Cutler's [7] acoustic analysis, the hypothesis to be tested was that the extent of anticipatory assimilation is dependent on phonological constraints in the lexicon: since in Japanese (but not in English) consonant clusters

are obligatorily (lexically) homorganic, assimilation should also be obligatory (post-lexically) in the blend in Japanese, but optional in English. The resulting EPG analysis largely confirmed these predictions.

Finally, we consider some acoustic and articulatory data from Australian languages which have a markedly different phonological structure compared with that of any European language. In particular, many Australian languages have a more complex syllable-final than syllable-initial phonological inventory and they are remarkable in showing diachronic initial, rather than (as in many European languages) final consonant loss. Compatibly, kinematic data from two speakers of the Australian language Warlpiri suggest a pattern of synchronic variability in consonants that is very different from that of English or German: in Warlpiri, syllable-final consonants become more salient in positions of sentence-prominence.

Taken together, the different degrees of consonantal strength in syllable-initial vs. syllable-final distinction is at best a tendency, and not a universal, that can be strongly influenced by the phonological system of the language.

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