

**Frequency effects and the restructuring of underlying representations: the case of Polish true geminates**

Frequency effects are argued to determine the targets of analogical changes; specifically, less frequent forms are attracted by more prevailing patterns (Bybee 2004). Much research within usage-based theories of language has been dedicated to account for this phenomenon, yet the main focus has been on the attraction to existing patterns (Bybee 1995, Bybee 2000, Hay 2015, Pierrehumbert 2001).

This study explores the phenomenon of a phonological change affecting low-frequency forms in the lack of an attractor. Specifically, it focuses on the current representation of identical double consonants in Polish. The generative literature labels them as ‘false’ geminates (Rubach 1986a, 1986b), establishing their status on the basis of their behaviour with respect to palatalisation rules. Namely, in palatalised forms it is only the second segment that undergoes a change. If the first segment happens to assume the same shape as the following one, this change is accounted for by independent assimilatory processes (Rubach 1984). However, assimilation is said to target only coronal segments. Dorsal consonants must remain unaltered. To give an example, the word *Mekce* [‘mektɕɛ] (sg. fem. loc. of *Mekka* [‘mɛkka] ‘Mecca’ place name) should never become [‘mɛtɕtɕɛ], even in rapid speech. If such a form occurred, the only explanation would be that the double consonant is in fact a true geminate because there is no independent assimilatory process in Polish that could change a dorsal into the coronal sound identical with the following segment.

As revealed by data from the National Corpus of Polish (Przepiórkowski et al. 2012), the type and token frequency of dorsal double consonants is marginal, in contrast to coronal segments. Therefore, our study investigates the influence of frequency effects on the representation of identical double consonants in Polish.

To answer our research question, we tested N=56 Polish people aged 18-30 and N=34 people aged more than 50 using a non-word repetition task. All items were designed in such a way so as to resemble real place names. Respondents were in fact told that they would be exposed to a list of real foreign place names. All items consisted of three syllables and had a feminine ending ‘a’ [a]. The 14 names with double consonants were scattered on the list of 55 pseudo-names. They were recorded by a Polish speaker in standard pronunciation so as to employ sounds only from the Polish phonetic inventory. Subsequently, they were played via headphones to respondents, whose task was to repeat them in a declined form. The purpose of this procedure was to elicit output in the locative (the frame sentence *Jestem w ...* ‘I am in ...’ required declension), which would automatically trigger palatalisation. After each item, respondents had several seconds to produce the frame sentence. In the second part of the experiment, respondents were asked to decline the names but in writing in order to check for the influence of orthography. We also controlled for other variables, such as level of education, and place of origin.

All items with identical double consonants were transcribed and subsequently assessed so as to isolate the group of ‘true’ and ‘false’ geminates. These two categories were compared in the case of dorsal consonants in both age groups. As for coronal segments, we failed to isolate the category of ‘true’ geminates since in this particular case identical palatalised

consonants may result from assimilatory processes. However, we managed to establish the group of names with heterogeneous double coronals, which can only be labelled as ‘false’ geminates.

We also conducted a corpus analysis to establish the exposure to identical double consonants in Polish. We established type and token occurrences for relevant groups in the National Corpus of Polish using recursive syntax queries to generate concordance lists. To ensure data representativeness, we filtered out phonologically irrelevant items from our concordances.

The preliminary results of the study reveal that both experimental (younger) and control (older) groups produce ‘true’ dorsal geminates. In fact, their productions contain significantly more ‘true’ than ‘false’ geminates (experimental:  $F=9.75$   $p=6.6 \times 10^{-9}$ , control:  $F=5.26$   $p=2.7 \times 10^{-5}$ ). This phenomenon can be explained by almost non-existing exposure to dorsal geminates which can undergo palatalisation. Corpus analysis gave only one type - *Mekka*. The results also reveal that in both age groups the number of false geminates is significantly higher in the category of coronals than in that of dorsals (experimental:  $F=4.66$   $p=4.4 \times 10^{-6}$ , control:  $F=3.11$   $p=0.00138$ ). This is accounted for by higher exposure to coronal geminates in Polish (47 types). Thus, as expected, high type frequency preserved the representation of identical double consonants within coronals. On the other hand, dorsal double consonants have undergone restructuring of their underlying representation due to marginal exposure. This result seems to suggest that a negative frequency effect can lead to the restructuring of representations.

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