Yer alternations and frequency effects

The process of vowel-zero alterations in Polish, also referred to as yers, has been debated widely in the phonological literature. One of the main analytic generative approaches of the process focuses on the role of the syllable structure in the realization of yers, and denies the difference between yers and full vowels (Gorecka, 1988; Czaykowska-Higgins, 1988; Jarosz, 2005; Rysling 2016 and others), whereas the second prominent approach assumes that yers differ from the full-vowels and should be marked as exceptional segments in the underlying representation (Gussmann, 1980; Rubach, 1986, 2016 and others). However, none of these approaches considers the possible variability of the process. Even though numerous words always display alternations in everyday language, e.g. *pies* 'dog' (nom. sg.) – *psa* (gen. sg.), Polish speakers sometimes use different forms of some words alternately, for example, words such as *karczma* ('inn' nom. sg.) can be inflected both as *karczem* or *karczm* in the genitive plural. The variability of this process is also visible in loanwords such as *falafel*, which manifest themselves in two possible genitive singular versions (*falafela* or *falafla*).

Owing to these problems, there is still no consensus reached on the nature of those alternations, that is, whether yers should be treated as exceptional underlying segments encoded within a word or if there exists a grammatical rule which results in vowel epenthesis in certain contexts. These analyses focus mainly on finding a unified account for the alternation process, ignoring the fact that there exists variability in the inflected forms in native speakers.

Regarding these problems, this paper proposes a different perspective that allows gradience and bases its productivity on the probabilistic premises: the usage-based theory (Pierrehumbert, 1999; Bybee 2001; Mańczak, 2011 and others). For this purpose, an experiment was conducted in order to investigate whether frequency has any impact on vowel-zero alternations in Polish.

In order to check whether the sonority influences the process of vowel-zero alternations in Polish, the nonce words were divided into four groups according to their final consonant cluster. The second factor taken into account while designing the experiment was the frequency of occurrence of given final clusters. The data was extracted from NKJP (Narodowy Korpus Języka Polskiego – 'The National Corpus of Polish') and cleared out of foreign words and abbreviations, so in total it consisted of around 220 million tokens. The experiment was built using Google Forms and was conducted online. It consisted of 58 examples, each containing 4 nouns to rate on the scale from 1 (very natural) to 5 (very unnatural). In total, the participants rated 232 items. 23 nouns were masculine, 30 feminine, and 5 neuter. 13,804 data points were collected from 119 participants. The statistical analysis of the data was performed with Cumulative Link Mixed Model fitted with the Laplace approximation from the original package (Christensen, 2018) for R (R Core Team, 2018). The statistical analysis of the data demonstrated that the frequency of occurrence of certain patterns influences the productivity of the yer alternations in Polish.

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