Affixation in the Caucasus – a quantitative phonological approach

1. Introduction

The Caucasus contains some of the world's most elaborate affixation patterns (Daniel & Ganenkov 2009: 671), which is paired with some of the world's largest consonant inventories (Beguš 2020: 699). The languages of the Caucasus therefore constitute a highly interesting case to examine the possible correlations between affixation and consonant inventories from a phonological perspective. The Caucasus is furthermore interesting as it contains three endemic language families which all have rich morphology but with clear differences in affixation patterns.

2. Database

I have compiled a database of 10,555 nominal and verbal affixes from 55 languages from five language families spoken in the Caucasus, i.e. Kartvelian, Nakh-Dagestanian, Northwest Caucasian, Turkic and Indo-European. These affixes have been coded for affix type, grammatical function and phonological form. The phonological form of each affix has been coded according to its phonotactics, i.e. syllable structure, and thereafter its consonants and vowels. The consonants were coded according to place of articulation, manner of articulation and voicing. Allomorphs and allophones were included whenever they were mentioned in the grammatical descriptions, in order to capture all available variation as segmental *morphologically conditioned phonology* is a well-known phenomenon in e.g. Turkish (Inkelas 2011: 69). I have also compiled two tentative lexical datasets of 5858 verbal roots from 40 Nakh-Dagestanian, Turkic and Indo-European languages in the Caucasus and 5429 nouns from all five languages families in order to compare lexicon with roots.

3. Analysis

The data was later analysed in Spyder (Python software) by quantifying the trivariate consonants focusing on the place of articulation and the manner of articulation. The place of articulation and manner of articulation of all consonants were concatenated into one cross tabulation, which subsequently counted all consonants split up by phoneme (combining voiced and voiceless consonants) in the database. The combined cross tabulation was thereafter converted into proportions instead of the actual counts.

4. Phonological results

The most striking result is that denti-alveolar consonants, i.e. alveolars and dentals (cf. Maddieson 1984), outnumber all other places of articulation by far as they comprise 54.754% of all consonant phonemes in the database, which is somewhat unsurprising however as denti-alveolars are found in almost all languages (Gordon 2016). The most common places of articulation follow their general acquisition in child language (Jakobson 1968; Ferguson & Farwell 1975; Dellert at al. 2021), but this does not explain why denti-alveolars are so overrepresented. The verbal roots showed no significant difference in the rates of denti-alveolars between roots and affixes, which indicates that denti-alveolars are generally overrepresented in the data, but there were significant differences in the rates of e.g. velar stops (p = .051*), velar ejectives (p = .016*) and uvular stops (p = .004**). The nominal data also yielded significant differences for e.g. velar stops (p = .004**), velar ejectives (p = .0121*) and

uvular stops (p = .0429*). The lexical datasets are limited, so including more data would be relevant to better understand how phonology interacts with affixation.

References

Arkadiev, Peter & Lander, Yury (2020). 'The Northwest Caucasian languages', in Maria Polinsky (ed.) *The Oxford Handbook of Languages of the Caucasus*. Oxford: Oxford University Press, pp. 369-446.

Beguš, Gašper (2020). 'Segmental Phonetics and Phonology in Caucasian Languages', in Maria Polinsky (ed.) *The Oxford Handbook of Languages of the Caucasus*. Oxford: Oxford University Press, pp. 689-728.

Daniel, Michael & Ganenkov, Dmitry (2009). 'Case Marking in Daghestanian', in Andrej Malchukov & Andrew Spencer (eds.), *The Oxford Handbook of Case*. Oxford: Oxford University Press, pp. 668-685.

Dellert Johannes, Erben Johansson, Niklas, Frid Johan, Carling Gerd (2021). 'Preferred sound groups of vocal iconicity reflect evolutionary mechanisms of sound stability and first language acquisition: evidence from Eurasia'. *Philosophical Transactions of the Royal Society B*, 376. London: The Royal Society Publishing.

Ferguson Charles A., Farwell Carol B. (1975). 'Words and sounds in early language acquisition'. *Language*, Vol. 51, No. 2, pp. 419–439.

Gordon, Matthew K. (2016). *Phonological Typology*. Oxford Survey In Phonology & Phonetics. Oxford: Oxford University Press.

Inkelas, Sharon (2011). 'The Interaction Between Morphology and Phonology', in John Goldsmith, Jason Riggle & Alan C. L. Yu (eds.) *The Handbook of Phonological Theory*, 2nd Ed. Chichester: Blackwell Publishing Ltd, pp. 68-102.

Jakobson, Roman (1968). *Child Language, Aphasia and Phonological Universals*. 1st ed. The Hague: De Gruyter Mouton.

Maddieson, Ian (1984). *Patterns of Sounds*. Cambridge: Cambridge University Press.