

Ultrasound images of the tongue root position in the [i] – [ɨ] contrast in Polish

Traditionally the distinction between [i] and [ɨ] in Polish has been captured in terms of the phonological feature [back], with [ɨ] being treated as back (for example, Rubach 1984). This analysis is supported by the phonological behavior of [ɨ] which does not cause palatalization and can never follow a prepalatal consonant. This interpretation is, however, not supported by the phonetic facts. Wierzchowska (1980) describes [ɨ] as articulated with a front tongue position. The distinction between the two vowels has been also attributed occasionally to the difference in the tongue position (Nowak 2002, Cavar 2004). The accounts by Nowak and Cavar relied primarily on theoretical arguments, with little data available to evaluate the phonetic soundness of the proposal.

In recent years a cheap and relatively non-invasive methodology has been developed for imaging of tongue surfaces using a 4-D ultrasound (Stone 2004, Gick 2002). This methodology has been used in research on ATR harmonies in Kinande and Yoruba (Whalen & Gick 2001) and vowel harmony effects in Turkic and Mongolic languages (Jonathan Washington, p.c.). In this paper we relate results of the measurements of the tongue root position for Polish high vowels using the 4-D ultrasound methodology to provide further arguments in the discussion on the featural system of vowels in Polish.

References

- Cavar, Malgorzata. 2004. *Palatalization in Polish: An Interaction of Articulatory and Perceptual Factors*. Doctoral dissertation. University of Potsdam.
- Gick, Bryan. 2002. The Use of Ultrasound for Linguistic Phonetic Fieldwork. JIPA.
- Nowak, Paweł. 2000. Palatalization in Polish: an Optimality-Theoretic Approach. Ms.
- Rubach, Jerzy. 1984. *Cyclic and Lexical Phonology. The Structure of Polish*. Dordrecht: Foris.
- Stone, Maureen. 2004. A Guide to Analyzing Tongue Motion from Ultrasound Images. PhD Diss: U. of Maryland.
- Whalen, Douglas H. & Bryan Gick 2001. 2001. Intrinsic F0 and pharyngeal width in ATR languages. *Journal of the Acoustical Society of America* 110(5), Pt. 2, 2761.
- Wierzchowska, Bożena 1980. *Fonetyka i fonologia języka polskiego*. Wrocław: Zakład Narodowy im. Ossolińskich – Wydawnictwo Polskiej Akademii Nauk.