The effect of lexical factors on the perception of voicing in regressive voicing assimilatory contexts in Hungarian

The present study aims to explore the impact of lexical factors on the recoverability of the voice feature of word-final alveolar fricatives in Hungarian in neutralising contexts. It has been observed (e.g., Jansen 2004, Gráczi 2010, Bárkányi & G. Kiss 2015) that some phonetic correlates of the voicing contrast (e.g., vowel–consonant duration ratio, phonation in the consonant) are systematically preserved in neutralising environments, i.e., before obstruents at morpheme- and word-boundaries. It has also been shown that emergent homophony and semantic misinterpretation can militate against complete phonological neutralisation. Charles-Luce (1993) in an acoustic study examining regressive voicing assimilation in Catalan found that voicing contrast is more likely to be partially preserved in minimal pairs than in non-minimal pairs. Recent research on Hungarian (Bárkányi & G. Kiss to appear) seems to indicate that the observed acoustic differences remain below the perceptual threshold, which strongly suggests that the phonological voicing contrast of obstruents (specifically, that of the alveolar fricatives /s/ and /z/) is indeed neutralised before obstruents in Hungarian. It can be hypothesized that if regressive voicing assimilation in Hungarian is perceptually complete, that is, the differences found in previous acoustic studies are not "audible" to native speakers, lexical factors will not be likely to influence recoverability, thus, there will be no differences in the identification of alveolar fricatives in minimal pairs and non-minimal pairs. However, if the underlying voicing of the fricative is partially recoverable, minimal pairs and non-minimal pairs are likely to behave differently. The present paper aims to test this hypothesis in the following way.

A perception study with synthesised stimuli was set up and carried out. Tests words either belonged to a minimal pair (*mész – méz* 'whitewash/honey') or did not (*vész – géz* 'danger/gauze'). In these stimuli, the amount of voicing in the fricative, and the duration of the fricative and vowel were manipulated the following way. The length of the segments in the test words were determined in accordance with previous acoustic studies: the first consonants (/m/, /v/, /g/) were 50 ms long, /eː/ was 250 ms long and the fricative 210 ms. Voicing was added in five steps to the final fricative, i.e., it contained 14%, 22%, 30%, 38% and 46% of voicing. Furthermore, the duration of the vowel plus consonant portion was set at 360 ms. The minimal segment duration for both vowels and consonants was 130 ms, the maximum 230 ms. At each voicing level, vowel and fricative lengths were changed in 20-ms steps starting with a 130-ms-long vowel and a 230-ms-long consonant, and ending up with a 230-ms vowel and a 130-ms consonant. The target words appeared in the following three phonetic contexts: before /p/, before /b/ and before the vowel /a/, all three across a word boundary. For example, the *mész/méz* tokens appeared in the following sentences:

(1) A mé**sz/z p**akolás nem jelent nagyobb erőfeszítést.

A mé**sz/z b**erakás nem jelent nagyobb erőfeszítést.

A mé**sz/z á**trakás nem jelent nagyobb erőfeszítést.

('The packing/placing/transfer of ___ doesn't take much effort.')

The total number of tokens embedded in each of the three sentences was 30 (5 voicing ratios × 6 duration ratios) for each word pair (i.e., there were altogether 60 stimuli). The experiment used a multiple forced choice test format in which the participants had to decide whether the word they heard was *mész/méz* or *vész/géz* by clicking on a computer screen showing these two choices. Different participants were used for the two types of word pairs (minimal pair group vs. non-minimal pair group).

At the time of submitting this abstract, not all the results have been analysed yet. But once we have gathered all the data, we will compare them by fitting generalized logistic mixed effects models to them. Random effects will be used to model the experiment structure the following way. We will fit random intercepts and random slopes for the proportion of voicing and the vowel to consonant duration ratio varying across participants and items (the stimuli the participants heard). These will show at what voicing ratio and at what vowel-to-consonant duration ratio listeners start to categorize the tokens heard as voiced rather than voiceless. Then these results will be compared in the minimal pair vs. non-minimal pair group. Based on the above, we should not be able to find a statistically significant difference between the two groups if regressive voicing assimilation is a complete and fully neutralizing process in Hungarian.

References

Bárkányi, Zsuzsanna and Zoltán G. Kiss. 2015. The perception of voicing contrast in assimilation contexts in minimal pairs. Acta Linguistica Academica.

Bárkányi, Zsuzsanna and Zoltán G. Kiss. to appear. Why do sonorants not voice in Hungarian? And why do they voice in Slovak? In Katalin É. Kiss, Balázs Surányi and Éva Dékány (eds.) Approaches to Hungarian 14: Papers from the 2013 Piliscsaba conference. Amsterdam and Philadelphia: John Benjamins. 65–94.

Charles-Luce, Jan. 1993. The effects of semantic context on voicing neutralization. Phonetica 50. 28–43.

Gráczi, Tekla Etelka. 2010. A spiránsok zöngésségi oppozíciójának néhány jellemzője [Some characteristics of the voicing contrast of fricatives]. Beszédkutatás 18. 42–56.

Jansen, Wouter. 2004. Laryngeal contrast and phonetic voicing: A laboratory phonology approach to English, Hungarian, and Dutch. Doctoral dissertation. University of Groningen.