

The role of laryngeal cues in the perception of Hungarian fricatives in voicing assimilation

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The present paper reports a pilot study that aims to investigate the perceptual cues associated with the laryngeal contrast in Hungarian sibilant fricatives. The study is based on the results of a phoneme-identification experiment that investigated how native speakers of Hungarian deal with regressive assimilatory voicing and devoicing, whether the contrast in this context is completely or only partially neutralised perception-wise. We will also discuss the methodological difficulties involved in such experiments.

Speech perception is a widely researched topic (e.g., Pisoni & Remez 2004); however, studies on the perception of assimilations are less abundant. It has been shown that listeners do compensate for place assimilations: plausible, but not implausible assimilations, were often confused perceptually with canonical word forms in word identification tasks (e.g., Mitterer & Blomert 2003). There are very few studies dealing with the perceptual aspects of regressive voicing assimilation (RVA). Kuzla et al. (2010) discuss progressive voicing assimilation in German and show that listeners compensate for assimilatory devoicing in judging partially devoiced fricatives more often as lenis in assimilation contexts (across a word boundary) than in non-assimilation contexts (when the obstruent in question occurs in absolute word-final/pre-pausal environment).

A number of recent acoustic studies have shown that Hungarian RVA is a phonologised process for stops, i.e., voicing contrast is completely lost before either voiceless or voiced obstruents. In our earlier production studies we have observed that fricatives behave differently from stops in RVA: voiced obstruents trigger considerably less voicing in fricatives than in stops. Therefore, fricatives maintain the laryngeal contrast before voiced obstruents which is implemented by phonation as well as duration-related cues. According to [reference to be added after review]'s perception study that used synthesised stimuli, if an utterance-final sibilant contains at least a cut-off value of 30% voicing, it is more likely to be categorised as voiced, but very long vowels can also elicitate voiced responses even if the sibilant is mostly voiceless. As far as we are aware of, the only study examining the recognition of obstruents in voicing assimilation contexts in Hungarian is Gow & Im (2004) who claim that the context effects they observed were not due to language-specific phonological knowledge but rather relied on perceptual mechanisms. Their study, however, did not try to determine cut-off values between voiced and voiceless obstruents in Hungarian in assimilation contexts like this (i.e., how much phonation an obstruent should contain to be categorised as 'voiced'), which is the aim of the present paper.

We designed a forced-choice perception experiment where listeners are presented with a synthesised lexical item (HLSyn; Hanson et al. 1999) in which they have to decide whether they hear a voiceless or a voiced segment (such as *mész* 'lime' with final underlying /s/ or *méz* 'honey' with final underlying /z/) while they see a gap sentence on the screen. For example: *A hallott szót az alábbi mondatból vágják ki. Melyik szót hallotta? // A _____ balra van.* 'The word you heard has been cut from the sentence below. Which word have you heard? //

The _____ is to the left.’ The stimuli are presented in Praat’s ExperimentMFC. In the test three parameters are systematically manipulated: vowel duration, fricative duration, and the ratio of voicing within the consonant. Target consonants are followed by a word with an initial voiced or unvoiced consonant (or a vowel as a control) in a prosodically neutral sentence with no intervening IP boundary. The values of manipulated parameters are based on our earlier production experiments.

Our expectations (to be confirmed by the finalised experiment) are that the perceptual cueing capability of the preceding vowel similarly to the utterance-final context plays a very important role in the categorisation of the fricative. The voiceless fricative is hypothesised to be the “default” case as there seems to be a bias towards identifying the assimilated fricative as underlyingly voiceless rather than voiced. Underlyingly voiced fricatives are expected to be identified as “voiced” in less than 50% of the cases – they are more likely to be perceived as voiceless independently of the voicing or devoicing context.

References

- Gow, D.W. Jr. & A.M. Im (2004) A cross-linguistic examination of assimilation context effects. *Journal of Memory and Language* 51. 279–296.
- Kuzla, C., M. Ernestus, & H. Mitterer (2010). Compensation for Assimilatory Devoicing and Prosodic Structure in German Fricative Perception. In C. Fougeron, B. Kühnert, M. D’Imperio, & N Vallée (Eds.), *Laboratory Phonology 10* (pp. 731–758). Berlin: Mouton de Gruyter.
- Mitterer, H. & L. Blomert (2003). Coping with phonological assimilation in speech perception: Evidence for early compensation. *Perception and Psychophysics* 65(6). 956–969.
- Pisoni, D. B. & R. E. Remez (eds.) (2004). *The Handbook of Speech Perception*. Blackwell Publishers.