

Do phonological and phonetic contrasts go hand in hand?
An acoustic and lexical study of anti-harmonic and vacillating stems in Hungarian
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Background: Hungarian vowel harmony has been in the centre of interest of ‘traditional’ phonological research (cf. Booij 1984; Clements 1976; Dienes 1997; Esztergár 1971; Hare 1990; van der Hulst 1985; Kontra & Ringen 1986 ff. Kornai 1987; Morén 2006; Ringen 1978 ff., Ringen & Vago 1998 ff., Vago 1976 ff., Zonneveld 1980, *inter alia*) which has, however, relied on largely impressionistic descriptions of the data. Within the recent laboratory phonology paradigm, Benus et al. (2004); Benus & Gafos (2007) studied the phonetic properties of stems containing the vowels [i], [ix], [e] or [e:] in Hungarian, where some stems take front suffixes (transparent stems), but other stems with the same vowels take back ones (anti-harmonic stems). The traditional claim (cf. Siptár & Törkenczy 2000) has been that the two classes show no differences in vowel quality, and thus each stem or stem vowel has to be lexically specified for triggering front or back harmony. Benus & Gafos challenged this position, claiming that the vowels in anti-harmonic stems are pronounced with a more back articulation than the vowels in transparent stems. based on ultrasound and magnetometric evidence from 3 speakers.

While this study has successfully argued against the traditional position, it fails to answer some questions. First, as Hayes et al. (2009) have shown, the number of neutral vowels at the left edge of the stem has an influence on the choice of the suffix, suggesting that the difference in articulation cannot be the only explanation for the different behaviour of these stems. Second, ‘vacillating’ stems are unaccounted for: these can take both front and back suffixes.

Research questions: Our first goal was to determine whether and to what extent the articulatory contrast reported by Benus & Gafos (2007) is mirrored in the speech stream (recall that Scobbie & Stuart-Smith 2002 have shown that articulatory differences do not always show up in the acoustics). In addition, we set out to investigate whether vowels in vacillating stems pattern with vowels in transparent stems, anti-harmonic stems, or show different behaviour altogether.

Experiments: We conducted two pilot experiments with the same 2 subjects. In the experiment determining which stems are vacillating for each subject, the same set of words was presented with both front and back suffixes. Each form appeared in 2 carrier sentences: one consisting almost entirely of front vowels, the other of back vowels. Participants were asked to choose whether only the front or the back suffixed form or both forms were acceptable.

The acoustic experiment included the words from the first experiment, plus the slightly modified set of transparent–anti-harmonic word pairs used by Benus & Gafos (2007). Each word appeared twice in the same carrier sentence, and was presented three times in random order, yielding a total of six occurrences.

Results: In the first experiment, the set of stems deemed vacillating was different for the two subjects, and both sets were different from the expectations of the authors. There was a strong lexical element visible in the choice of suffixes: words of the shape CaCiCi could either be fully vacillating or fully back. The carrier sentences had no effect on the participant’s choices.

The findings of the acoustic experiment were partially in line with Benus & Gafos’s results: for a subset of stems, transparent stems showed significantly higher F2 than the corresponding anti-harmonic stems. However, the effect was reversed for other transparent–anti-harmonic stem pairs, especially with non-high vowels. Vacillating stems, however, complicated the picture further: they were acoustically indistinguishable from anti-harmonic stems for one speaker, but were consistently pronounced more back than anti-harmonic stems for the other speaker.

Conclusions: Our findings support the view that contrasts previously thought to neutralise during phonological computation can actually be carried over to phonetic realisation. On the other hand, phonetic behaviour alone is not a sufficient indicator of the phonological behaviour of transparent, anti-harmonic and vacillating stems. While it is clear that much more empirical research is needed to adequately describe the Hungarian facts in their complexity, we believe the data already at hand call for a more sophisticated model of the phonetics–phonology interface than is standardly assumed.

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