

Intervocalic voicing of the Hungarian /h/

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In the phonological literature, the Hungarian /h/ is mostly considered in connection with its asymmetric behaviour in voicing assimilation (it triggers regressive devoicing, but does not undergo voicing before voiced obstruents, see e.g., [1][2][3]). Although from the phonological perspective it is also claimed that the breathy voiced laryngeal [ɦ] realization is the result of a purely phonetic process (see e.g., [3]), we also see that the intervocalic voicing of the laryngeal /h/ is suggested to be phonologically conditioned [4][5]. As [4] claims, prevocalic /h/ may not be deleted if the containing syllable is accented (as in *a hír* ‘the news’), but it may be deleted if the containing syllable loses prominence in fast/casual speech and the /h/ undergoes voicing. It should be noted that these claims also imply that the prevocalic realization of /h/ may not be voiced, if the containing syllable bears an accent.

In the phonetic literature, the status (consonant or not), the place of articulation (laryngeal, velar, or palatal), and the voicing characteristics of /h/ go back to a long debate (see e.g., the overview of [6]). With respect to the voicing characteristics of the Hungarian /h/, an agreement has been reached in some sense, since phonetic descriptions from the last decades unanimously assert that /h/ is (breathy) voiced intervocalically (see e.g., [7][8]). However, this prevalent supposition was lacking firm empirical basis for a surprisingly long time. Through spectrographic analysis of 50 intervocalic realizations in unsystematically varying contexts, [9][10] showed that /h/ is likely to undergo voicing under certain conditions: (i) if the speech rate is fast and the duration of the consonant reduces accordingly, and (ii) if the /h/ is produced in the context of front vowels (compared to back vowels). Due to the unsystematic variation of the conditioning phonetic contexts, however, it is still an open question what the vocalic quality features are that facilitate voicing of the Hungarian /h/. More specifically, we do not know if the above cited differences would replicate if the front and back vowel contexts were systematically varied in the comparison.

In our experiment we investigate the phonetic realization of the intervocalic /h/ to shed more light on the phonetic and phonological parameters potentially affecting its voicing characteristics. We address the questions if the voicing of /h/ is affected by the presence or absence of pitch-accent, and by the horizontal and vertical tongue position. We recorded /h/ realisations in syllable onsets uttered by 10 speakers in three conditions (varying in the phonetic context of /h/, in the position of /h/ in the word, and in the syllable having or not having pitch-accent): (i) word medial /h/ as the onset of an unaccented syllable (VhV); (ii) word-initial /h/ (V#hV) in a pitch-accented word (pre-verbal focus), and (iii) word-initial utterance-initial /h/ as the onset of the pitch-accented syllable (#hV). (Condition (iii) serves as a baseline, since in this condition /h/ is predicted to bear a glottal place of articulation and no voicing both by phonetic and phonological literature.) In the present study we compare /uhu/ and /phɒ/ with /ihi/ and /ɛhɛ/ to test the effect of horizontal and vertical tongue position in the three contexts, and include the comparison of /yhy/ and /uhu/ as the most strictly controlled comparison possible to evaluate the effect of the horizontal tongue position (3 repetitions in each case). We manually segment target vowels and consonants and label the unvoiced section of /h/ by the use of cues in the low-pass filtered acoustic signal. We also detect if pauses preceded the target consonant and measure the duration of these pauses.

Preliminary analysis of three speakers’ data shows that the voicing of /h/ is not affected by

the horizontal and vertical tongue position, since the mean amount of voicing is 100% both in symmetrical velar and palatal contexts in both intervocalic conditions (if the realisation of /h/ is not preceded by a pause), and it is less than 20% before all of these vowels in a word-initial utterance-initial position (Fig 1). A slight effect of the horizontal tongue position is apparent if we compare /uhu/ (100% voicing in VhV and V#hV conditions) and /yhy/ (88 ± 24% and 80 ± 37% voicing in the two conditions respectively) (Fig 2), but due to the small number of data points statistical tests are not feasible in this preliminary analysis to evaluate this effect any further. Fig 1 also shows that the voiced ratio of the intervocalic /h/ is not affected by the combined effect of the presence or absence of pitch accent and word initial position either: the average voicing ratio of these /h/ realisations is 100% irrespective of the presence of pitch-accent or word boundary. Fig 3 shows that word-initial intervocalic /h/ realisations are unvoiced only in those cases where a preceding pause is also present.

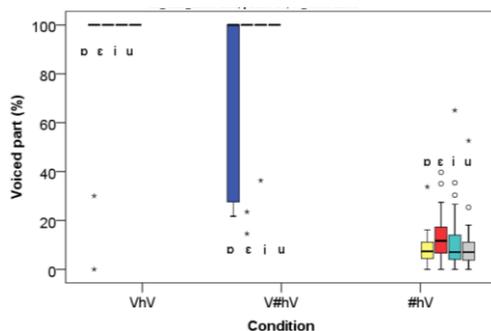


Figure 1. Voicing ratio of /h/ in /phw/ /ehε/ /ihi/ /uhu/, /p#hw/ /e#he/ /i#hi/ /u#hu/ and in /#hw/ /#he/ /#hi/ /#hu/

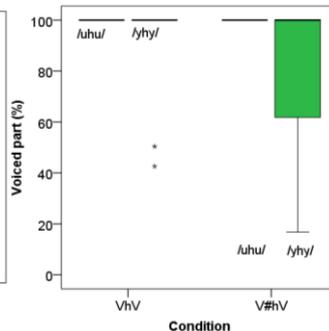


Figure 2. Voicing ratio of /h/ in /uhu/ and /yhy/ contexts in VhV and V#hV conditions

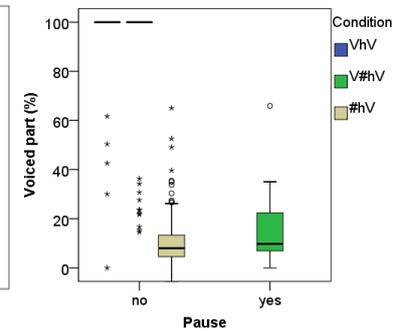


Figure 3. Voicing ratio of /h/ as a function of preceding pause

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