Prosodic cues in whispered speech: Empirical insights into prosody from a segmental perspective

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For many decades speech research was dichotomized into studies on segments on the one hand and investigations of prosody on the other hand. This is especially discernible in surveys of cross-linguistics tendencies or ‘universals’ (cf. e.g. Greenberg 1963, Maddieson 1984, Hayes 1995). A turning point in speech research, as I will show, goes back to the emergence of Prosodic Hierarchy (Nespor & Vogel 1986) which has created a platform for examining the interaction between segments and prosody in general, and segment and intonation in particular (cf. Żygis, Mooshammer & Shattuck-Hufnagel 2013).

The present paper is aimed at giving some insights into the complexity of segment-prosody interaction not only in voiced speech but also in whispered and semi-whispered speech. In particular, I will present how voiceless segments in general and voiceless sibilant clusters in particular contribute to different intonation contours (i.e. L% in statements and H% in polar questions), and, thus, serve to convey different communicative meanings (see also Niebuhr, Lill & Neuschulz 2011, Niebuhr 2012). Moreover, I will address the question of how the differences between statements and questions which are syntactically identical are realized in whispered speech, where the main acoustic correlate of intonation, that is F0, is completely absent and in semi-whispered speech, where F0 is only partially present.

The results, based on the acoustic analysis of sixteen native speakers of Polish, point to significant differences in spectral properties of both utterance-final vowels and consonants in statements and polar questions. Some spectral differences, including spectral slopes, are more distinguishable for questions versus statements in the whispered speech mode than in other speech modes, suggesting their compensatory function for the fundamental frequency.

Overall, the experimental evidence shows a tight interdependence between segments and prosody. Intonation, which helps to encode the communicative meaning, strongly interleaves with the segmental level. In case of the absence of the fundamental frequency, other cues encode intonation in order to ‘rescue’ a message intended by a speaker. Speakers produce intended intonation patterns by varying the choice of cues as well as their magnitude in dependence on both speech modes and communicative functions of their message.
References:


