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Multimodal levels of prominence – the use of eyebrows and head beats to convey information structure in Swedish news reading

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Gestures, including head and eyebrow movements, have been shown to align with pitch accents in speech and in this way contribute to the production and perception of prosodic prominence. However, the way in which these different modalities might interact is still not well understood. Adding, for instance, a head nod to an accented word will increase its prominence, as will adding a rapid movement of the eyebrows. There have also been suggestions that head and eyebrow beats may have cumulative prominence-lending functions. However, it is an open question whether and how pitch accents and eyebrow and head movements may interact in encoding levels of multimodal prominence and whether these prominence levels could be employed by speakers and listeners in the (de-)coding of shades of information structure (IS), such as new vs. given vs. accessible information.

We have examined the occurrence of head- and eyebrow beats in Stockholm Swedish newsreaders as a function of linguistic prominence levels attested for this variety: focal vs. non-focal pitch accents. The corpus consisted of 31 brief news readings from Swedish Television, comprising speech from four speakers (two female) and 986 words in total. It was annotated for focal accents and head and eyebrow beats, independently by three annotators. We counted 229 words accompanied by a head beat, but only 67 occurrences of eyebrow beats, with a vast majority occurring together with a head beat. There were clear effects of focal accentuation: 63% of the eyebrow beats, and 67% of the head beats, respectively, occurred in connection with a focal accent. These figures suggest that we are dealing with six main types of constellations of pitch accent type, head beats, and eyebrow beats: A – focal pitch accent with head and eyebrow beat; B – focal pitch accent with head beat; C – focal pitch accent without gesture; D – non-focal pitch accent with head and eyebrow beat; E – non-focal pitch accent with head beat; F – non-focal pitch accent without gesture.

The low number of occurrences of eyebrow beats (about 2 per piece of news on average), as well as their regular co-occurrence with head beats, might suggest that the use of eyebrow beats is restricted to higher-level prominence and IS coding. The much more frequent head beats might instead be associated with lower-level prominence and speech rhythm – and possibly also to the coding of (other conditions of) IS. Our preliminary conclusion from this study so far is that head and eyebrow movements can represent two quite different modalities of prominence cuing, rather than just being equivalent, cumulative prominence markers. We are currently studying the information-structural conditions underlying different constellations of pitch accents and head and eyebrow beats observed (see A-F above).

Keywords: prosody, pitch accent, focus, beat gesture, information structure