The alignment of co-speech gestures with prominence in Estonian: a preliminary analysis

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The paper presents a first investigation of the alignment of co-speech gestures with intonation in Estonian. Co-speech gestures are visible actions of body parts that are used during speaking and primarily related to speech prosody (Kendon 2004). More specifically, this study focuses on the link between head and eyebrow movements and prosodic prominence, i.e. the phenomenon by which a syllable or word in an utterance stands out relative to other syllables or words in the utterance. It has been shown previously for other languages that prosodic prominences serve as the main anchor points for head and eyebrow movements (e.g. Ambrazaitis & House 2022) but no such analyses have been carried out for Estonian before.

The data was collected using Electromagnetic Articulography (EMA) as a side-product of an articulatory study. EMA is a point-tracking method for measuring the position of parts of the mouth during speech (see e.g. Rebernik et al. 2021), but the method also allows for recording the movements of other body parts, and has recently been used for measuring co-speech head nods (e.g. Frid et al. 2019; Carignan et al. 2024) or capturing hand and finger movements in sign language studies (Mertz et al. 2024).

The data comprises short sentences consisting of four words, designed to be elicited as one phrase in broad focus, with the nuclear pitch accent on the final word (e.g., *Sinna selle maali paneksime.* 'We would put this painting there.'). In addition to the sensors for capturing articulatory movements in this study, sensors were placed on the back of the neck (cervical vertebra, approx. C3-C4), on the left and right mastoid and the nasion to measure movements of the head in relation to the body, and in the central position above the left and the right eyebrow to measure the movements of eyebrows. The data was recorded from 15 native Estonian speakers.

The paper analyses the vertical movements of the head and eyebrows and their alignment with the accented syllable nuclei.

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