

Interplay of information structure, pitch contour, and gesture in spontaneous interactions

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Gestural and prosodic units align in a specific way: the beginning of the gesture stroke usually slightly, but systematically precedes the onset of the corresponding prosodic unit, reflecting the co-expressive power of co-speech gestures. These effects have been observed with prototypical iconic gestures (Ferré, 2010) as well as with beat gestures marking the focal part of the sentence (Ebert, Evert, & Wilmes, 2011).

In our contribution, we aim to broaden the perspective from the study of foci to more information structure categories so as to detect a range of conventionalized patterns in the alignment of gestures and intonation units that are involved in marking information structure. Adopting the perspective of Multimodal Construction Grammar (Zima & Bergs, 2017), we have analysed recordings of Czech spontaneous interactions (16 speakers, 80 minutes in total) extracted from a developing multimodal corpus of Czech. We have coded almost 5000 utterances for gesture-prosody-language alignment, annotating (i) the timing and the form of gesture strokes, (ii) intonation contours, detected both acoustically and auditorily (Ward, 2018), and (iii) 4 information structure values (topic, contrastive topic, focus, contrastive focus as well as other potentially relevant linguistic properties of accompanied structures (e.g. lexical frequency, parts of speech, specific structural properties, e.g. topicalization constructions, presence of focus markers, and discourse activation). In the quantitative analysis, we used a mixed-effects regression model with the information structure categories, the above mentioned linguistic properties and gesture forms as fixed effects, and individual speakers as random effects.

The gesture-speech temporal coordination varies significantly, with a slight inclination of focus gestures to precede the speech in contrast to no such effect on topic. More specifically, we show that in both contrastive topics and foci, the gestural marking is more frequent and/or more clearly articulated. When topicalization is reflected in the linguistic structure (i.e. in specific types of conventionalized topic constructions, e.g. topic infinitives or right-dislocations in Czech), co-speech gestures are attested more often than with more standard topics. Gestural movement is significantly slower when accompanying topics. The “topical” gestures are also more open and flatter when compared with co-speech gestures accompanying focus which tend to be more “abrupt”, accentuated and/or bounded. This gestural patterning aligns with specific intonational contours in the 4 information structure categories under investigation, pointing to a complex co-expressive system of information structure. In this view, we bring new evidence for gesture being a means of embodied communicative dynamism (Firbas, 1992) which signals the informativeness of the accompanied expression by the amount of energy involved in the performance of the gesture.

References

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