

Aligning hand movement behaviour and intonation sequences

Skomroch, H.¹, Lausberg, H.¹, von Unterladstetter, V.², Sandler, M.², Strunk, J & Himmelmann, N.²

¹ Abteilung für Neurologie, Psychiatrie und Psychosomatik, Deutsche Sporthochschule Köln ² Institut für Linguistik, Universität zu Köln

Introduction: Speakers temporally align a great proportion of their gestures with intonational features of speech. Strokes tend to co-occur with (McClave, 1998) or slightly precede (Loehr, 2004) nuclei of intonational phrases. Additionally, gesture phrases appear to be aligned with intermediate intonational phrases. In a similar vein, cross-linguistic research showed that syntactic variation in packaging information relates to different hand gestures independent from cross-cultural variation (Özyürek et al. 2005). The aim of this study is to test whether cross-linguistic variation in the segmentation of prosody correlates to variations of hand movement behavior segmentation.

Methods: 23 speakers of Papuan Malai, 8 speakers of Yali, 13 speakers of Woi and 17 speakers of German have been asked to renarrate a short film to a partner. The speakers' hand movement behavior during the narration has been annotated according to NEUROGES-Elan (Lausberg & Sloetjes, 2009) specifying the Structure and Focus for the right and left hand. Prosody of 15 German speakers has been segmented into intonation units according to rhythmic and tonal criteria. Merging analyses of both modalities allows for the investigation of temporal alignment.

Results: Repeated Measurement Anovas revealed that Malai and German speakers performed more *phasic* units than speakers of the Woi and Yali samples. Although Malai speakers did not perform more *phasic in space* units the total time spent with these was longer. This indicates that *phasic in space* units were longer. Based on temporal overlap we found that *in space* units are more likely to co-occur with intonation units than *on body* units.

Discussion: Our preliminary results support previous findings showing that a great proportion of gestures are aligned to speech. Based on the differences in hand movement segmentation, we expect to find differences in intonational segmentation between the groups in future analyses.

References:

- McClave, E. (1998). Pitch and Manual Gestures. *Journal of Psycholinguistic Research*. 27(1), 69 – 89.
- Lausberg, H., & Sloetjes, H. (2009). Coding gestural behavior with the NEUROGES--ELAN system. *Behavioral Research Methods*, 41(3), 841-849.
- Loehr, D. (2004). *Gesture and Intonation*. (Doctoral Dissertation). Georgetown University.
- Özyürek, A., Kita, S., Allen, S, Furman, R. & Brown, A. (2005) How does linguistic framing of events influence co-speech gestures? Insights from crosslinguistic variations and similarities. *Gesture*. 5 (1/2), 219 – 240.