Function follows form: Distinctive and variable features of hand movements in NEUROGES

Konrad Juszczyk
Adam Mickiewicz University in Poznan, Poland
juszczyk@amu.edu.pl

Co-speech gestures are multifunctional and have large individual variability (Bressem, Ladewig & Mueller 2014). Using the NEUROGES coding system (Lausberg 2019), however, we can show how function follows form, based only on kinesic, visual features of hand movements without referring to verbal modality. The phonological model used for speech sounds, including the features matrix and feature geometry, has been adopted to describe sign language structure (Brentari 2019). Hand movements, however, including co-speech gestures with specific functions, do not form minimal pairs in terms of sign language phonology (Goldin-Meadow & Brentari 2017). However, they do form contrasts. Therefore, comparing NEUROGES types of movements (e.g. *emphasis – baton* and *emphasis – palm-out*) shows differences listed as DISTINCTIVE features, as well as VARIABLE features. Such contrasts were observed not only in the NEUROGES handbook (Lausberg 2019), but also during the analysis of approximately 500 minutes of data derived from 80 dialogues involving 40 participants. The material was annotated according to the NEUROGES coding system, and the inter-rater reliability ranged between 0.4 and 0.8 (calculated for 25 percent of the total corpus). These results varied depending on the tier and the annotation value, and they are comparable to the kappa coefficients reported in Lausberg and Sloetjes (2016) and Lausberg (2019). The system comprises 111 binary features, and 35 of those features are distinctive and used to define each function and type as a unique combination of features. Consequently, the proposed system can be treated as a practical aid in manual annotation based on the NEUROGES system and it could be used to describe conversational hand movements categories in a similar fashion as hand movements used in sign language.

References: • Brentari, D. (2019). *Sign Language Phonology.* Cambridge: Cambridge University Press. • Bressem, J., Ladewig, S. H. & C. Müller (2014). Linguistic Annotation System for Gestures (LASG). In C. Müller, A. Cienki, E. Fricke, S. Ladewig, D. McNeill & S. Tessendorf (eds.), *The Routledge Handbook of Language and Gesture.* New York: Routledge, 1098–1120. • Goldin-Meadow, S. & D. Brentari (2017). Gesture, Sign, and Language: The Coming of Age of Sign Language and Gesture Studies. *Behavioral and Brain Sciences* 40. • Lausberg, H. (2019). *The NEUROGES® Analysis System for Nonverbal Behavior and Gesture: The Complete Research Coding Manual Including an Interactive Video Learning Tool and Coding Template.* Berlin: Peter Lang GmbH. • Lausberg, H. & H. Sloetjes (2016). The revised NEUROGES–ELAN system: An objective and reliable interdisciplinary analysis tool for nonverbal behavior and gesture. *Behavior Research Methods* 48(3)*, 926–939,* https://doi.org/10.3758/s13428-015-0622-z.