

Proposal for a tutorial by Hedda Lausberg and Konrad Juszczyk

The Neuropsychological Gesture (NEUROGES) Analysis System for Linguists

Instructors



Hedda Lausberg is a Full Professor of Neurology, Psychosomatic Medicine, and Psychiatry at the German Sport University Cologne. Her main research interests are the neuropsychology of expressive movement behavior and the development of methods for the analysis of expressive body movement. She has developed the NEUROGES system in a 10-years research project granted by the German Research Association.



Konrad Juszczyk is an Assistant Professor in Psycholinguistics Department, in Institute of Linguistics at Adam Mickiewicz University in Poznań. His main research interests are multimodal communication and metaphor in coaching sessions as well as gesture recognition software.



Jana Bressemer is an academic assistant at the chair for German Linguistics, Semiotics and Multimodal Communication at the Technische Universität Chemnitz. Her main research interests are multimodality (speech/gesture and text/image), language and cognition and pragmatics of gesture use. Together with Cornelia Müller and the ToGoG team, she has developed a linguistic, form-based approach to gestures.



Silva Ladewig is an Assistant Professor, currently replacing Cornelia Müller at the European University Viadrina, Frankfurt (Oder). Her main research interests are multimodal grammar, gesture-sign interface, gestural repertoires and embodiment. Together with Cornelia Müller and the ToGoG team, she has developed a linguistic, form-based approach to gestures.

Content of the tutorial

NEUROGES, developed by Hedda Lausberg, is an objective and reliable system for the analysis of speech-accompanying hand movements and gestures. Up to now, it has been applied for the analysis of hand movements and gestures in more than 500 individuals from different cultures (Germans, U.S. Americans, francophone and anglophone Canadians, Suisse, Koreans, Kenyans, and Papua New Guineans), including healthy individuals as well as individuals with brain damage and with mental illness. A recent review of 18 empirical studies using NEUROGES in combination with ELAN demonstrates a good reliability of the system (Lausberg and Sloetjes 2015).

Since neuropsychological research provides evidence that some gesture types are generated in the right hemisphere independent from left-hemispheric speech production (Feyereisen, 1987; Kita & Lausberg, 2008; Hogrefe et al., 2010), and phenomenologically, the existence of gesture - speech mismatches has been demonstrated (McNeill, 1992; Goldin-Meadow et al., 1993), NEUROGES offers the methodological approach to first analyze gestures as a means of expression per se, i.e., to analyze the mental image behind the gesture, and in a second step to examine the relation between gesture and speech. In a seven steps comprising assessment algorithm, the ongoing stream of hand movement behavior is segmented and classified according to movement criteria into more and more fine-grained units, resulting in a distinct analysis of gestures based on their visual appearance. The analysis algorithm is shown on the website <http://neuroges.neuroges-bast.info/neuroges-analysis-system> and illustrated by video samples.

A potential approach to explore the relation between gesture and speech is the Linguistic Annotation System for Gestures (LASG) developed by Jana Bressemer, Silva Ladewig and Cornelia Müller. This system is designed to analyze language and gesture usage grounded in cognitive linguistics paradigm. It offers a form-based method to systematically reconstruct the meaning of gestures by distinguishing four main building blocks: 1) form, 2) sequential structure of gestures in relation to speech and other gestures, 3) local context of use, i.e. gestures' relation to syntactic, semantic, and pragmatics aspects of speech, and 4) distribution of gestures over different contexts use. For instance, using the LASG tiers TEMPORAL RELATION (pre-positioned, post-positioned, parallel, no speech), SEMANTIC RELATION (redundant, Complementary/Supplementary, contrary, replacing) and SEMANTIC FUNCTION (emphasizing, modifying, additive, substitutive) hand movements are annotated to determine their temporal and semantic relation with speech units and thus their local contexts of use. As such, the system allows for a close description of the linguistic and the gestural context in which a gesture is placed, which is fundamental for the reconstruction of gestural meanings and for determining the relevance of gestures in language use.

NEUROGES values for functions and types of gestures can be used to annotate words related to particular gestures if they are in temporal proximity of the gesture and share some semantic resemblance with them. This will be shown on short samples of videos annotated in ELAN software.

Tutorial program

90 minutes	Introduction to NEUROGES (Hedda Lausberg)
15 minutes	Break
60 minutes	Introduction to LASG (Jana Bressemer, Silva Ladewig)
15 minutes	Break
30 minutes	Sample annotation using NEUROGES and LASG (Konrad Juszczyk)

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