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P16281-G03: Types of Conflict Resolution and their EEG Correlates

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The central research questions of the project are:

- (1) Are there EEG-correlates for possible vs. impossible conflict resolution during a violation of grammar in the EEG?
- (2) Is it possible to determine correlates of different conflict resolution activities in the frequency profile of the EEG (to functionally disambiguate ERPs)?

So far, EEG-investigations of language processing focus on correlates of processing activities at different levels of grammar. However, given the preferential use of stimuli with grammatical violations in experiments, the observed processing activity will necessarily include conflict resolution. Therefore it is adequate to investigate if and how the type of conflict resolution plays a role, namely the type of conflict resolution in relation to grammatical alternatives: grammatically possible conflict resolution (there is a wellformed alternative) vs. grammatically impossible conflict resolution (there is no wellformed alternative). A positive result would not only have implications for psycho- and neurolinguistics but also for the theoretical modelling of linguistic knowledge in grammar theory. The issues at stake are experimentally tested with grammatically non dissolvable conflicts during the fronting of the finite verb in main clauses (with verbs having more than one separable prefix).

Furthermore, previously gathered data are explored with frequencyanalytical methods that have proved successful in an already completed project („Sentence production: EEG-oscillations during sentence processing“, FWF) to gain additional EEG correlates for the differentiation of ERP-results: negativities (latency around 400 ms over centro-posterior regions) are established as reliable ERP-correlate for conflicts with semantic wellformedness. However, in a series of experiments the N400-effect could be found with conflicts that have their cause not or not unambiguously in the semantic domain of language perception, for instance conflicts of case, congruency, argument structure, negative polarity, word position. Viewed under the perspective of the knowledge system „grammar“, these domains belong to different subsystems of syntax. Therefore the question is posed whether the observed N400-effect is a not further differentiatable, global reflex of an undifferentiated language controlled conflict processing activity or if it is possible to gain more specific processing correlates with

more appropriate analytical techniques. Finally the applied frequency-analytical methods are evaluated and if necessary refined.

Publications:

2004. Röhme, Dietmar, I. Bornkessel, M. Schlesewsky, St. Frisch & H. Haider. Fractionating language comprehension via frequency characteristics of the human electroencephalogram. *Neuroreport* 15 (3): 409-412.