

## **A dynamic view on the neural basis of language comprehension.**

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During language comprehension, incoming sounds or orthographic patterns trigger a cascade of memory retrieval operations that make available the necessary ingredients for understanding the message. Once available, these different ingredients have to be integrated (unified) into a coherent interpretation of the utterance, both at the sentence and at the discourse levels. Thus, two different cognitive processes, namely memory retrieval operations and unification operations, play a crucial role during language comprehension (cf Hagoort, 2005).

PET and fMRI studies have revealed that a large number of widely distributed brain areas is involved in language comprehension. However, due to their poor temporal resolution such studies provide a rather static picture of the brain's language network, mainly revealing the structure of this network. We are therefore investigating, in an increasing number of studies, whether the patterns of synchronization and desynchronization of EEG and MEG activity can capture the fast dynamics of the brain's language network. Event-related changes in EEG/MEG power and coherence are thought to capture changes in local and long-range neuronal interactions, respectively, and thus provide the necessary tools to study the dynamics of functional network formation in the brain (Bastiaansen & Hagoort, 2006).

Power and coherence changes in the EEG or MEG during language comprehension tasks have been observed in three different frequency bands: theta (4-7 Hz), lower beta (13-18 Hz) and gamma (above 30 Hz). The effects can roughly be subdivided into effects related to mnemonic aspects of language comprehension, which appear to be most prominent in the theta frequency range, and effects related to unification (mostly apparent in the beta and gamma ranges). In the lecture I will address the above issues, and give a brief overview of the available data.