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Morphologically complex words in the brain: Neuromagnetic evidence

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Language-related processes in the brain are known to unfold within tens of milliseconds. Magnetoencephalography (MEG) directly registers the magnetic field created by electrical activity of masses of neurons. The magnetic field is measured on the millisecond scale, without being distorted by e.g., the skull as extensively as electroencephalography (EEG). In addition, the brain activity is recorded by approximately 300 sensors, covering the whole head. Hence, MEG provides the necessary temporal and spatial accuracy to measure the brain activity related to morphological processing.

This talk will review studies that have approached morphological processing using MEG. Most of the available MEG studies focus on the processing of inflected and derived words –with a few exceptions, investigating the recognition and production of compound words. The reviewed studies use both visual and auditory modalities, tapping attentive as well as non-attentive processing of morphologically complex words. Furthermore, the studies use a wide range of experimental paradigms, from visual masked priming to the auditory oddball paradigm.

Overall, the results of the studies suggest full or at least partial combinatorial processing of complex words, supporting many current models of morphological processing. In addition, recent MEG findings on affix acquisition suggest that cortical memory traces for newly learned affixes are formed even after a very short exposure to novel morphology. Thus, the reviewed MEG findings add valuable evidence on when and where in the brain morphologically complex words are processed and acquired.

Primary author: LEMINEN, Alina (Department of Psychology and Logopedics, University of Helsinki)Presenter: LEMINEN, Alina (Department of Psychology and Logopedics, University of Helsinki)

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