Brain responses to violations of syntax and structural preferences: an MEG study

Snijders TM, Jensen O, Hagoort P
FC Donders Centre for Cognitive Neuroimaging, University of Nijmegen, Nijmegen

ERP studies have reported a number of effects related to syntactic processing. One of them is a late positive scalp potential, referred to as P600/SPS, which is elicited by a syntactic violation or a syntactically less preferred structure. This positive deflection starts at about 500 ms after the onset of the violation and usually lasts for at least 500 ms. Previous experiments suggest that the topographical distribution of the P600/SPS is different for grammatical as compared to structural preference violations. For example the sentence *"De man ziet de jongen en het meisje staren naar de hemel"* meets the grammatical preference of late closure. In the sentence *"De man ziet de jongen en het meisje staart naar de hemel"* the so-called late closure preference is violated while the sentence still is grammatically correct. The sentence *"De man ziet de jongens en de meisjes staart naar de hemel"* is grammatically incorrect. A (late closure) preference violation yields a more frontal distributed P600/SPS, while a grammatical violation leads to a more posterior distributed P600/SPS.
In the current experiment we aim at using the good spatial resolution of MEG to investigate if different sources of the P600 are involved in the processing of syntax and structural preference violations. Twelve subjects read sentences like the example above, which were flashed on a computer screen word by word. Sentences with the critical word presented in upper case were added to disentangle the sources generating the P600 and the classical P300 response. Event related fields were calculated for the different conditions. Preliminary results replicate the P600 using MEG. In the subsequent analysis we hope to identify the sources of the P600 in the different conditions using distributed current estimates and/or beamforming techniques.

Tineke Snijders, F.C. Donders Centre for Cognitive Neuroimaging, University of Nijmegen, Postbus 9101, 6500 HB Nijmegen, t. 024-3610978, e-mail tineke.snijders@fcdonders.kun.nl

Poster session: Cognition & Behavioral Neuroscience