



FENS Forum 2010 - Amsterdam

- Posters: to be on display from 8:00 to 13:15 in the morning and from 13:30 to 18:45 in the afternoon. Poster sessions run from 09:30 to 13:15 in the morning and from 13:30 to 17:30 in the afternoon. A one hour time block is dedicated to discussion with the authors (authors should be in attendance at their posters as from the time indicated.)
- For other sessions, time indicates the beginning and end of the sessions.

First author Menenti, Laura (poster)

Poster board F26 - Wed 07/07/2010, 11:15 - Hall 1

Session 205 - Human cognition 5

Abstract n° 205.17

Publication ref.: *FENS Abstr.*, vol.5, 205.17, 2010

Authors Menenti L. (1), Petersson K. M. (1, 2) & Hagoort P. (1, 2)

Addresses (1) Radboud University Nijmegen, Donders Institute (RU/DI-BCB), Nijmegen, Netherlands; (2) Max Planck Institute for Psycholinguistics, Nijmegen, Netherlands

Title From reference to sense: an fMRI adaptation study on semantic encoding in language production

Text Speaking is a complex, multilevel process, in which the first step is to compute the message that can be syntactically and phonologically encoded. Computing the message requires constructing a mental representation of what we want to express (the reference). This reference is then mapped onto linguistic concepts stored in memory, by which the meaning of the utterance (the sense) is constructed.

We used fMRI adaptation to investigate brain areas sensitive to reference and sense in overt speech. By independently manipulating repetition of reference and sense across subsequently produced sentences in a picture description task, we distinguished sets of regions sensitive to these two steps in speaking. Encoding reference involved the bilateral inferior parietal lobes (BA 39) and right inferior frontal gyrus (BA 45), suggesting a role in constructing a non-linguistic mental representation. Left middle frontal gyrus (BA 6), bilateral superior parietal lobes and bilateral posterior temporal gyri (BA 37) were sensitive to both sense and reference processing. These regions thus seem to support semantic encoding, the process of mapping reference onto sense. Left inferior frontal gyrus (BA 45), left middle frontal gyrus (BA44) and left angular gyrus (BA 39) showed adaptation to sense, and therefore appear sensitive to the output of semantic encoding.

These results reveal the neural architecture for the first steps in producing an utterance. In addition, they show the feasibility of studying overt speech at a detailed level of analysis in fMRI studies.

Theme F - Cognition and behaviour
Human cognition and behaviour - Language