

PW01-143 - SEPARATING DISTINCT ASPECTS OF THE VOLUNTARY SELECTION BETWEEN RESPONSE ALTERNATIVES: N2 AND P3 RELATED BOLD RESPONSES

R. Feurecker^{1,2}, S. Karch¹, G. Leicht¹, T. Meindl², I. Hantschk¹, V. Kirsch¹, M. Ertl¹, J. Lutz², O. Pogarell¹, C. Mulert¹

¹*Department of Psychiatry and Psychotherapy,* ²*Institute of Clinical Radiology, Ludwig-Maximilians University, Munich, Germany*

Voluntary selection between response alternatives belong to cognitive abilities controlling and regulating goal-directed behaviour. Voluntary selection processes are associated with increased neural activity, especially in medial and lateral frontal brain regions as well as the inferior parietal gyrus. However, the precise function of each brain region as well as the spatiotemporal characteristic of the brain regions involved is not yet clear. The aim of the present study was to disentangle distinct aspects of voluntary selection and their underlying neural processes. Hence, event-related potentials (ERPs) and functional MRI data were acquired simultaneously. Brain regions modulated by the task-induced amplitude variation of ERPs (N2, P3) were identified. The results showed N2-related hemodynamic responses, especially in medial and lateral frontal brain regions. Among other things, medial frontal brain regions are related to conflict monitoring, control of voluntary action and decision making. By contrast, the P3-amplitude proved to be predominantly related to increased BOLD responses in the temporo-parietal junction [TPJ] and lateral frontal brain regions. These brain regions are thought to play a decisive role in an attentional network involved in detecting auditory and visual stimuli.

Overall, the results of the study indicated a whole network of brain regions to be associated with voluntary selection processes. In addition, at least some frontal brain regions seemed to be involved at an earlier stage than temporo-parietal regions, probably indicating a top-down process.