

# Visual search for item- and array-centered locations in patients with left middle cerebral artery stroke

HELMUT HILDEBRANDT<sup>1,2</sup>, CATHLEEN SCHÜTZE<sup>1,3</sup>, MARKUS EBKE<sup>1</sup>, FREIMUTH BRUNNER-BEEG<sup>1</sup> and PAUL ELING<sup>4</sup>

<sup>1</sup>*Hospital of Bremen-Ost, Neurology, Bremen*

<sup>2</sup>*University of Oldenburg, Institute for Psychology, Oldenburg*

<sup>3</sup>*University of Bremen, Institute for Human-Neurobiology, Bremen*

<sup>4</sup>*Radboud University of Nijmegen, Department of Psychology, Nijmegen, The Netherlands*

In this study we systematically explored the impact of left hemisphere (LH) lesions on array-centered and item-centered spatial attention.

We investigated 16 LH first ever stroke patients, focusing on strokes of the Middle Cerebral Artery (MCA), and 15 healthy control subjects with a parallel and serial search paradigm. None of the LH patients had a hemianopia or neglect. We systematically varied the item-centered (left- or right-side of a single item) and the array-centered position (left or right position in the search array of ten items) of critical features. Lesion sites were evaluated using MRICro (Version 1.37; Rorden and Brett, 2000).

The results show that patients had no specific problem with parallel search. In serial search patients showed a left to right gradient-like increase in response time for array-positions and they omitted more items if the critical feature was located on the right side of the items in the right half of the array. For low performing patients we found an overlapping lesion area around and anterior to the precentral sulcus (Brodmann's area 6 and 44), encompassing the frontal eye field.

We conclude that LH MCA strokes may lead to search impairments in spatial attention, in particular in shifting to the right side of the visual field. Impaired rightward shifting moreover reduces the chance of detecting right-sided item features (but not left-sided). This suggests that spatial attention works with different reference frames, with spatial orientation being more basic than analyzing spatial aspects of objects.