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## Location-based selection for storage in visuo-spatial working memory

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Abstract Visual working memory is characterised by a limited storage capacity. Given this storage limitation, selection of behaviourally relevant objects based on locations, features or object category, is crucial. We conducted behavioural and ERP experiments to investigate location-based selection of multiple targets for storage in visual working memory, with a change detection paradigm. In the first experiment, the spatial locations of target-objects were marked in a preview display, before the appearance of target and distracter objects in the memory display. In the second experiment, spatial locations of distracter (response-irrelevant) objects were marked in the preview display. In the third experiment, a delay was introduced between preview and memory displays. In the forth experiment, the role of configuration-invariance in the transition between two subsequent preview displays, was investigated. The results show the effectiveness of the filtering is limited to

two or three target objects, respectively. In addition, the filtering effect can be partly explained by selection of a global spatial configuration of location pre-cues, which is superimposed to the selection of individual object locations. In the fifth experiment, the neural processes of spatial marking of target locations were investigated by means of an ERP study. The results of this experiment show that filtering of target objects takes place both during encoding and maintenance of the memory display. The effect during maintenance was larger over the first half second of the maintenance interval. This time specificity suggests an attentional consolidation effect during the delayed activity of the neurons. Finally, we developed a neurocomputational model to account for the behavioural and ERP results.

**Keywords** Visuo-spatial working memory • Selective attention.

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