Rapid top-down control over template-guided attention shifts to multiple objects

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PII: S1053-8119(16)30424-4
DOI: http://dx.doi.org/10.1016/j.neuroimage.2016.08.039
Reference: YNIMG13397

To appear in: *NeuroImage*

Received date: 7 June 2016
Revised date: 18 August 2016
Accepted date: 18 August 2016

Cite this article as: Anna Grubert, Johannes Fahrenfort, Christian N.L. Oliver and Martin Eimer, Rapid top-down control over template-guided attention shift to multiple objects, *NeuroImage* http://dx.doi.org/10.1016/j.neuroimage.2016.08.039

Rapid top-down control over template-guided attention shifts to multiple objects

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Abstract

Previous research has shown that when observers search for targets defined by a particular colour, attention can be directed rapidly and independently to two target objects that appear in close temporal proximity. We investigated how such rapid attention shifts are modulated by task instructions to selectively attend versus ignore one of these objects. Two search displays that both contained a colour-defined target and a distractor in a different colour were presented in rapid succession, with a stimulus onset asynchrony (SOA) of 100 ms. In different blocks, participants were instructed to attend and respond to target-colour objects in the first display and to ignore these objects in the second display, or vice versa. N2pc components were measured to track the allocation of spatial attention to target-colour objects in these two displays. When participants responded to the second display, irrelevant target-colour objects in the first display still triggered N2pc components, demonstrating task-set contingent attentional capture while a feature-specific target template is active. Critically, when participants responded to the first display instead, no N2pc was elicited by target-colour items in the second display, indicating that they no longer rapidly captured attention. However, these items still elicited a longer-latency contralateral negativity (SPCN component), suggesting that attention was oriented towards template-matching objects in working memory. This dissociation between N2pc and SPCN components shows that rapid attentional capture and subsequent attentional selection