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How the Strength of a Strong Object Mask Varies in Space and Time When it is Used as an Uninformative Singleton in Visual Search for Target Location

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ABSTRACT

Strong visual masking originates from sensory perceptual interactions between target and mask and also from attentional competition between target and mask even though mask does not correspond to attentional control settings. The relative contributions of these different masking mechanisms are difficult to estimate. One strategy to begin approach this problem is to use the same stimulus as a mask and as a non-informative singleton in a selective attention task. The purpose of the present study was to find the spatial and temporal intervals where a strong object mask interferes with target-object search when used as a non-informative singleton. In visual search for target location, we found that a visual object that has a strong forward and backward masking power on target-object correct perception when spatially superimposed on target can impair target perception from a spatially separated location only when presented up to 100 ms after the target and only from a spatially close location. These results are explained by a processing account where the initial analysis of stimuli features allows to determine the best candidate location for the target, but as soon as this location is established, a nearby later appearing object may intrude it, replacing the target in explicit perception. The higher-level mechanisms based interpretation is strengthened by the finding that any local masking effects of the same adjacent singleton were absent in the task of single-target identification.

KEYWORDS

Masking, Visual Search, Target Localization, Attentional Capture, Consciousness

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