ABSTRACT

Title: Rapid guidance of visual search by object categories

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Visual search is often controlled by attentional templates that represent specific target items or target features, but can also be directed towards object categories. We studied the relationship between item-based and category-guided attentional control during visual search for one specific item (e.g., the letter C), two or three items (e.g., the letters C, F, and X), or categorically defined targets (e.g., any letter). To assess the efficiency of visual search for single, multiple, or category-defined targets, we measured the N2pc component as an electrophysiological marker of attentional target selection. In Experiment 1, where targets were presented among distractors from a different category (e.g., letters among digits), a category-based selection strategy was available. Category-based attentional control triggered spatially selective modulations of visual-perceptual processing that emerged within less than 200 ms after stimulus onset, and preceded the effects of item-specific attentional templates. In Experiment 2, where letter targets appeared among letter distractors, target detection could no longer be guided by categorical top-down task sets. Search efficiency decreased as the target set size increased, in line with capacity limitations for item-specific attentional templates. Results demonstrate that category-based attentional guidance can be employed rapidly and efficiently during visual search for alphanumeric targets.