
It has been assumed that visual search displays are representationally static: that the target representation is fixed; and that the similarity between the target and non-target (NT) stimuli does not change over time. It has also been assumed that NTs only occupy the role of distractors and hence do not interact with the target representation. Over the past two years, we have presented a variety of results at VSS that are inconsistent with these assumptions. Instead, we showed that NTs, rather than merely being distractors, also act as context elements that decisively determine the representation of the target; and that these effects unfold over exposure time.

Previously, we had shown context effects with perceptually ambiguous stimuli. Here, we report results of three experiments that show that even nominally unambiguous target stimuli can become ambiguous over time, owing to context effects. In one experiment, participants searched for an ‘open’ square (a square with one side missing) among ‘closed’ squares, and a closed square among open squares, in 100 and 250 ms displays. Whereas search was efficient for both display compositions in the 100 ms exposure [set size X display composition, F(X, XX)=X.X, n.s.], search for the closed square became inefficient in the 250 ms exposure [F(X, XX)=X.X, p < .0X].

These results are predicted by, and support, a model of visual search proposed by Rauschenberger and Yantis (2003) that is based on the redundancy (in the Garnerian sense) of the NTs. We show that NTs that are low in redundancy do not necessarily initially lead to inefficient search. Instead, search grows inefficient, as the NT context renders the representation of the target stimulus more similar to that of the NTs (in longer exposures). These findings are not accommodated by present models of visual search and underscore the need to view search displays as representationally dynamic.