

Dr. Mike Scheessele receives a Faculty Fellowship Award

Abstract

Visual search is the task performed by the human visual system in detecting a target object embedded in a field of non-target objects. Overwhelming evidence has shown that the more similar a target to the surrounding non-targets, the more difficult the search. Visual search for a target that is very similar to non-targets is assumed to be *serial*, while visual search for a target that is very different from non-targets is assumed to be *parallel*. With serial visual search, as more non-targets are added to the visual display, search time for the target increases – the visual system is presumed to check each display element until it finds the target. With parallel visual search, search time for the target does not increase as more non-targets are added to the visual display – the target is said to ‘pop out’ at the observer.

Recently, Rauschenberger, Peterson, Mosca, and Bruno (2004) demonstrated that increased exposure to a visual display may cause non-targets to provide a spatial context that influences perception of and search for a target. Accordingly, they claimed to be the first to show spatiotemporal context effects of non-targets in the visual search for a target. If this claim holds up, it could have wide influence on future research and design. For example, with respect to design of graphical user interfaces (GUIs), it may suggest that greater consideration be given to design of background elements with respect to a target button or element.

The boldness of their claim and the lack of evidence from other sources aroused my skepticism. Over summer 2005, I tried to ‘break’ their claim with a new experiment. One part of this new experiment sought to replicate the original Rauschenberger et al. (2004) results, while the second part sought to ‘break’ their claim with a simple manipulation of their original experiment. The first part did indeed replicate their results, while the new manipulation actually corroborated rather than refuted their claim. Since no one else (to my knowledge) has corroborated their claim, these results should be publishable. However, while the results of my new experimental manipulation support Rauschenberger et al. (2004), these results also reflect a significant increase in human subject error over that found in their study. Fortunately, I believe this increase in error can be explained by a new experiment. If so, this would add a novel twist to my results from last summer and strengthen the chance for their publication in a good journal. The funding I seek here is for paying human subjects and for paying a student to conduct this experiment. Funding for both would enable me to get results faster than if I try to rely exclusively on the Intro Psychology subject pool and run the experiment myself (which I did last summer). I believe time is critical here, because I presented a pilot study last May at the Vision Sciences Society annual meeting (Scheessele, Guthrie, and Gottschalk, 2005). This pilot study introduced my experimental manipulation and our results suggested that the claim of Rauschenberger et al. (2004) may be incorrect. This presentation generated much interest and since I have now publicly presented pilot results that conflict with their claim, I believe I should try to publish my new results as quickly as possible. I also seek funding for 2 additional experiments, plus funding for a one year renewal of two software licenses for software that I will use to analyze and present the new results.

References

- Rauschenberger, R., Peterson, M.A., Mosca, F., & Bruno, N. (2004). Amodal completion in visual search. *Psychological Science*, 15 (5), 351-355.
- Scheessele, M.R., Guthrie, D. T., & Gottschalk, D.R. (2005). Role of non-targets in detection of a target in visual search [Abstract]. *Journal of Vision*, 5 (8), 345a, <http://journalofvision.org/5/8/345/>, doi:10.1167/5.8.345.