

**Stony Brook University
The Graduate School**

Doctoral Defense Announcement

Abstract

Collaborative visual search

By

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Collaborative visual search is a group task in which two or more than two searchers scan the visual environment for particular targets, with the emphases on group performance instead of individual performance. The major goal of this study is to explore how people coordinate their behavior during collaborative search, particularly with regard to division-of-labor coordination strategies and micro-level behavioral coordination. Previous work demonstrated a spatial division of labor. To discover whether other coordination strategies might spontaneously emerge, we had groups of 2, 3, or 4 people engage in 3 collaborative search tasks: (1) searching for an oval dot among 494 black circular dots, (2) a color version of Experiment 1 having red, blue, green, and black dots partially segregated into non-geometric regions, and (3) a multiple-target task in which subjects searched for 1, 4, or 8 possible targets in 14-item displays (photo-realistic objects). We quantified division-of-labor by correlating the targets properties (e.g., location, color, identity) with the responses of individual searchers from a collaborating group. Consistent with previous work, subjects in Experiment 1 divided the search labor spatially, either splitting the display in two (2-person condition) or by quadrant (4-person condition). Experiment 2 produced very different results. Despite an identical configuration of dots, subjects now divided the search labor by feature, with each member of a 4-person group searching a different distractor color. Experiment 3 yielded evidence for yet another form of division-of-labor. Subjects divided the task by target rather than by space or feature, with searchers in the 4-person group each taking responsibility for a different potential target from the 4-object target preview. In experiment 4 & 5, we used the shared gaze paradigm and eye movement analyses to understand behavioral coordination during group search at a more micro-level. We found that shared gaze collaborative benefits resulted from the use of more dynamic coordination strategies, partners sharing gaze might adjust their coordination strategies moment-by-moment, much like a couple dancing across a ballroom dance floor.

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