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Self-Association Makes It Easier to Track Multiple Objects But Within Capacity Limitations: A Multiple-Object Tracking Investigation

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Abstract

The Self-Prioritization Effect (SPE) suggests that associating stimuli with the 'self' affords processing advantages in perception (Sui & Humphreys, 2012), attention (Keyes & Brady, 2010), long-term memory (Turk et al., 2008; Klein, 2012), working memory (Yin et al., 2019; Roy et al., 2023), and decision-making (Polman, 2012; Hu et al., 2019). An important aspect of working memory is the ability for continuous tracking, maintenance & updation. The Multiple- Object Tracking (MOT) paradigm involves constant attention and maintenance in working memory and online decision-making. The current study was designed to test the tracking performances for self- associated stimuli (neutral shapes and colored shapes) compared to stranger-associated stimuli (neutral shapes and colored shapes) in a multiple object tracking (MOT) paradigm. Additionally, we used three different set-sizes (6,8,10), where half of the shapes were targets, and half were distractors, to check for boundary conditions with respect to WM load. We found that with increasing set-size, tracking performance decreases significantly. Also, whether targets or distracters belong to the same (homogeneous) or different categories (heterogeneous) moderates the tracking performance of the participants, as target shapes becomes more complicated when the target and distracters are of the same type, i.e., the homogenous conditions. We found that the tracking performances of the self-associated shapes were significantly better than the stranger- associated target shapes when the target and distractors were of different categories (heterogeneous condition) but only upto set-size 8 due to working memory limits. Additionally, we found that self- associated shapes or colored shapes were significantly poorer in tracking when target and distractors were of same categories (homogeneous condition) within the working memory limits. These results suggest that individuals can pay more attention to self-associated stimuli, which are maintained in working memory and have better focus of attention, despite limited capacity WM resources. Keywords: self-association, tracking, multiple object tracking, working memory, visual working memory, identity, location.

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