Statistical learning of likely distractor locations in visual search is driven by the local distractor frequency

Thursday, July 21, 2022 11:10 AM (20 minutes)

Salient but task-irrelevant distractors interfere less with visual search when they appear in a display region where distractors have appeared more frequently in the past. In this study we tested two different theories of such statistical distractor-location learning. It could reflect the (re-)distribution of a global, limited attentional 'inhibition resource'. Accordingly, changing the frequency of distractor appearance in one display region should also affect the magnitude of interference generated by distractors in a different region. Alternatively, distractor-location learning may reflect a local response to distractors occurring at a particular location. In this case, the local distractor frequency in one display region should not affect distractor interference in a different region. To decide between these alternatives, we conducted three experiments in which participants searched for an orientation-defined target while ignoring a more salient orientation distractor that occurred more often in one vs. another display region. Experiment 1 varied the ratio of distractors appearing in the frequent vs. rare regions, with a fixed global distractor frequency. The results revealed the probability cueing effect to increase with increasing probability ratio. In Experiments 2 and 3, one ('test') region was assigned the same local distractor frequency as in one of the conditions of Experiment 1, but a different frequency in the other region –dissociating local from global distractor frequency. Together, the three experiments showed that distractor interference in the test region was not significantly influenced by the frequency in the other region, consistent with purely local learning.

Primary author: Dr ALLENMARK, Fredrik (Ludwig Maximilian University of Munich)

Co-authors: Dr ZHANG, Bei (Ludwig-Maximilian University of Munich); Prof. SHI, Zhuanghua (Ludwig Maximilian University of Munich); Prof. MÜLLER, Hermann (Ludwig Maximilian University of Munich)

Presenter: Dr ALLENMARK, Fredrik (Ludwig Maximilian University of Munich)

Session Classification: Poster Session 3 (coffee break)