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| Testing the target contrast signal theory. |

Thank you very much for taking time to participate in this study.

Visual search efficiency during a search task is often summarised by “search slopes” - the additional cost in reaction time for each additional distractor. While search tasks with a shallow search slopes are termed efﬁcient (pop-out, parallel, feature), there is no clear dichotomy between efﬁcient and inefﬁcient (serial, conjunction) search. Indeed, a range of search slopes are observed in empirical data.

Target Contrast Signal (TCS, Buetti et al., 2016) theory posits that during visual search behaviour is determined by comparing target template with every element present in the array in parallel, allowing quick rejection of peripheral non-target (distractors). While TCS has been successful in predicting several empirical results, and importantly, is a rare example of quantitative model that attempts to predict search slopes for efﬁcient visual search, it has only been tested by one research group. In the current study we aim to replicate Buetti et al. (2019). Additionally, we will carry out a within subject design (that is all participants complete all experimental conditions) to test if the theory makes predictions at individual level (the original study was between subject, that is different conditions were completed by different participants). Reaction time and accuracy in response to different conditions are our key dependent variables (variables that are expected to change as a result of our experimental manipulation). We will test different models to create best predictor of search slope.

Please feel free to ask any questions if you would like further information about the experiment.

In case of questions, do not hesitate to contact the experimenter Anna Hughes(anna.hughes@essex.ac.uk), or Alasdair Clarke(a.clarke@essex.ac.uk).

If you would like to read more about this research area, please see:

Simona Buetti, Deborah A Cronin, Anna M Madison, Zhiyuan Wang, and Alejandro Lleras. (2016). Towards a better understanding of parallel visual processing in human vision: Evidence for exhaustive analysis of visual information. *Journal of Experimental Psychology: General,* 145(6):672.

Alejandro Lleras, Zhiyuan Wang, Anna Madison, and Simona Buetti (2019). Predicting search performance in heterogeneous scenes: Quantifying the impact of homogeneity effects in efﬁcient search. *Collabra: Psychology*, 5(1).