EZ-Diffusion Modeling of Visual Search with Positive, Negative, and Neutral Cues
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Participants\textsuperscript{1} searched for a shape-defined target. Before search, they received a color cue. Negative cues indicated the color of upcoming distractors. Positive cues indicated the color of upcoming targets. Neutral cues were uninformative. Both positive and negative cues led to benefits\textsuperscript{2}, which were highly correlated\textsuperscript{3}.

It remains unclear how the processes of attention change when participants use these different cue types\textsuperscript{4,5}. In this work, we used the EZ-diffusion model\textsuperscript{6} to examine how attentional processing changes depending on the type of cue guiding attention. Note that we are making a simplifying assumption that the entire search process can be modeled as a single decision. We calculated drift, boundary, and non-decision time for each participant in an existing data set of 96 participants for each cue condition. We then compared the values for each parameter based on cue type.

We found a main effect of cue type on drift rate, with the slowest drift rate for neutral, followed by negative, and then positive cues. We found a main effect of cue type on boundary, with the positive cue boundary being significantly larger than the negative or neutral cue boundaries. Finally, we also found a main effect of cue type on non-decision time, with the positive cue non-decision time being significantly shorter than the negative or neutral cue non-decision time.

Our results suggest negative cues lead to benefits mainly through a shift in drift rate, while positive cues lead to benefits due to a combination of drift rate and reduced non-decision time.

\textsuperscript{5} Carlisle, N. B. \textit{Negative and Positive Templates: Two Forms of Cued Attentional Control.} Under Review.

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