Top Down Influence On Bottom Up Attention: Attention Set, Modulation or New Category?

Prepared by:

Roopali Bhatnagar

Supervised by:

Prof. W.J. MacInnes

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Hypothesis

Top down attentional set is capable of eliminating bottom up exogenous facilitation through manipulation of cue-target-onset-asynchrony (CTOA). We test if early attention exists at validly cued location, and if this can be seen in measures of attention like saccade response time (SRT), saccadic curvature, micro-saccades and pupil size.

Reference –
W. J. MacInnes, Hannah M. Krüger & Amelia R. Hunt (2014): Just passing through? Inhibition of return in saccadic sequences, The Quarterly Journal of Experimental Psychology, doi:10.1080/17470218.2014.945097

W. J. MacInnes (2016): Multiple Diffusion Models to Compare Saccadic and Manual Responses for Inhibition of Return, Neural Computation, vol. 29, no. 3, pp. 804-824. doi: 10.1162/NECO_a_00904

Saccadic Reaction Time Results
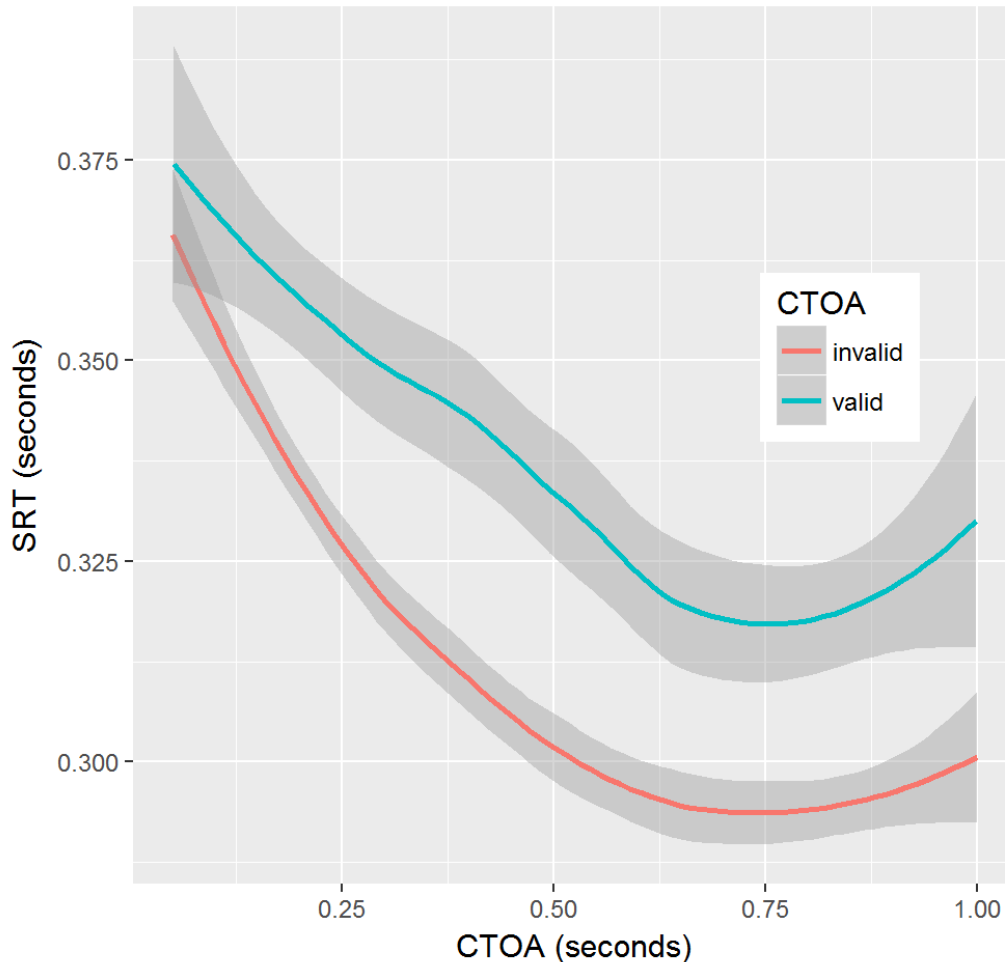
Data were analyzed using linear mixed effect model with CTOA, cue validity and target hemi-field as fixed effects and participant as random effect on the intercept and SRT as dependent measure.

The main effect of cue validity was significant ($\chi 2$ (1) = 150.87, p<0.001) with valid locations having slower RTs (25ms, SE = 2.1ms) than invalid locations on all CTOAs.

This plot shows us:
SRT (valid) > SRT (invalid) at all values of CTOAs i.e. robust IOR, right from the start. No facilitation at any CTOA.

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