

# Inhibition of return depends not on the coding coordinates but on the hemifield of cue-target presentation





Tatiana Malevich<sup>1,2</sup>, Elena Rybina<sup>1</sup>, Elizaveta Ivtushok<sup>1</sup>, Liubov Ardaseva<sup>1</sup>, and W. Joseph MacInnes<sup>1</sup>

1. Vision Modelling Lab, HSE, Moscow, Russia; 2. Werner Reichardt Centre for Integrative Neuroscience, Tuebingen, Germany





#### Introduction

As a foraging facilitator, Inhibition of return (IOR) must be coded in spatiotopic coordinates. Early reports confirmed this suggestion (e.g., Abrams & Pratt, 2000; Maylor & Hockey, 1985; Posner & Cohen, 1984) but recent results have shown that IOR is coded in both spatiotopic and retinotopic reference frames (e.g., Pertzov et al., 2010; Hilchey et al., 2012; Mathôt & Theeuwes, 2010; Krüger & Hunt, 2012). The present study was designed to examine the reference frame of IOR and to test whether retinotopic IOR might be a part of the spatiotopic IOR gradient.

We conducted four experiments with spatiotopically and retinotopically cued coordinates and an intervening saccade between the cue and target presentations. We alternated the response modality (manual and saccadic) and the cue-target spatial distance (fixed and continuous).

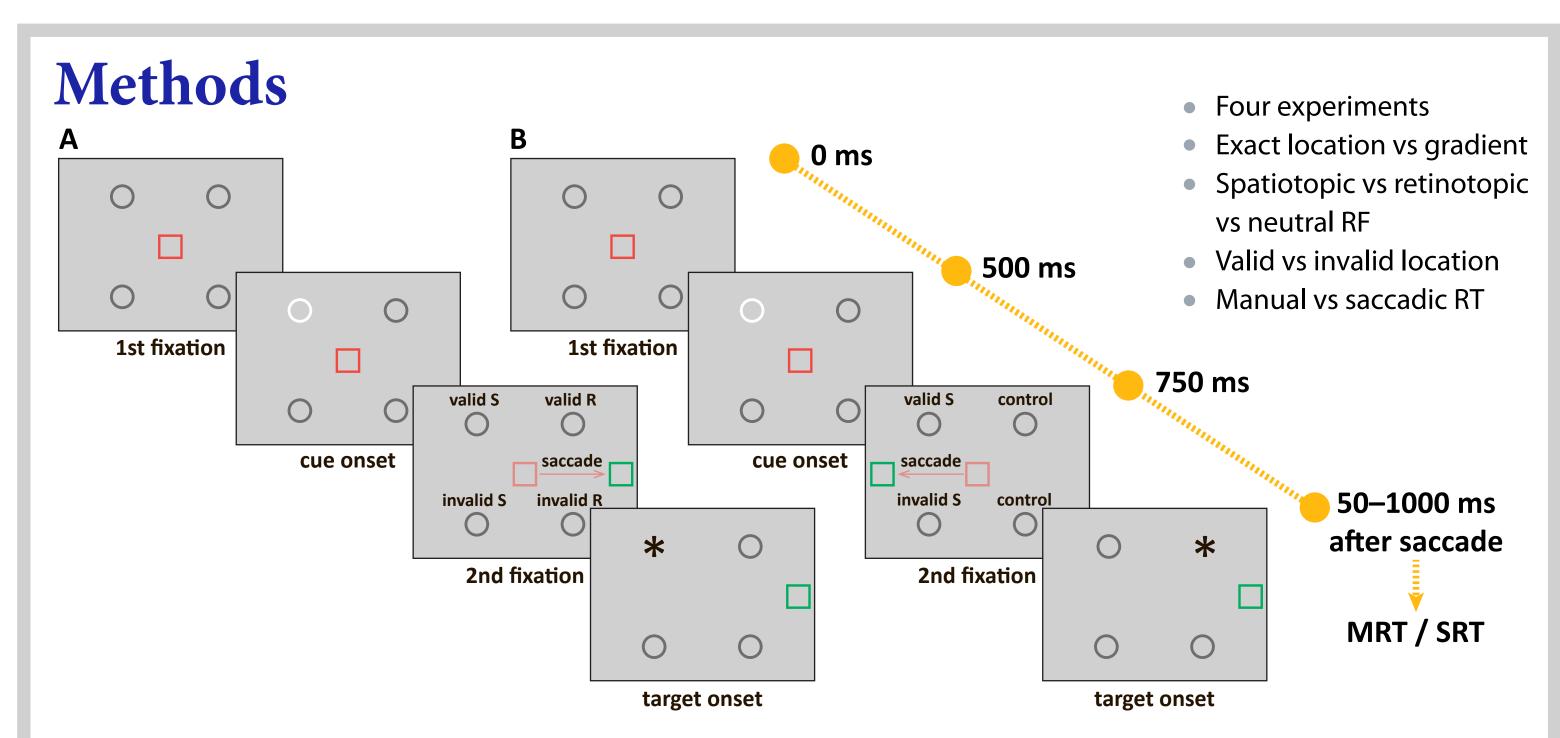


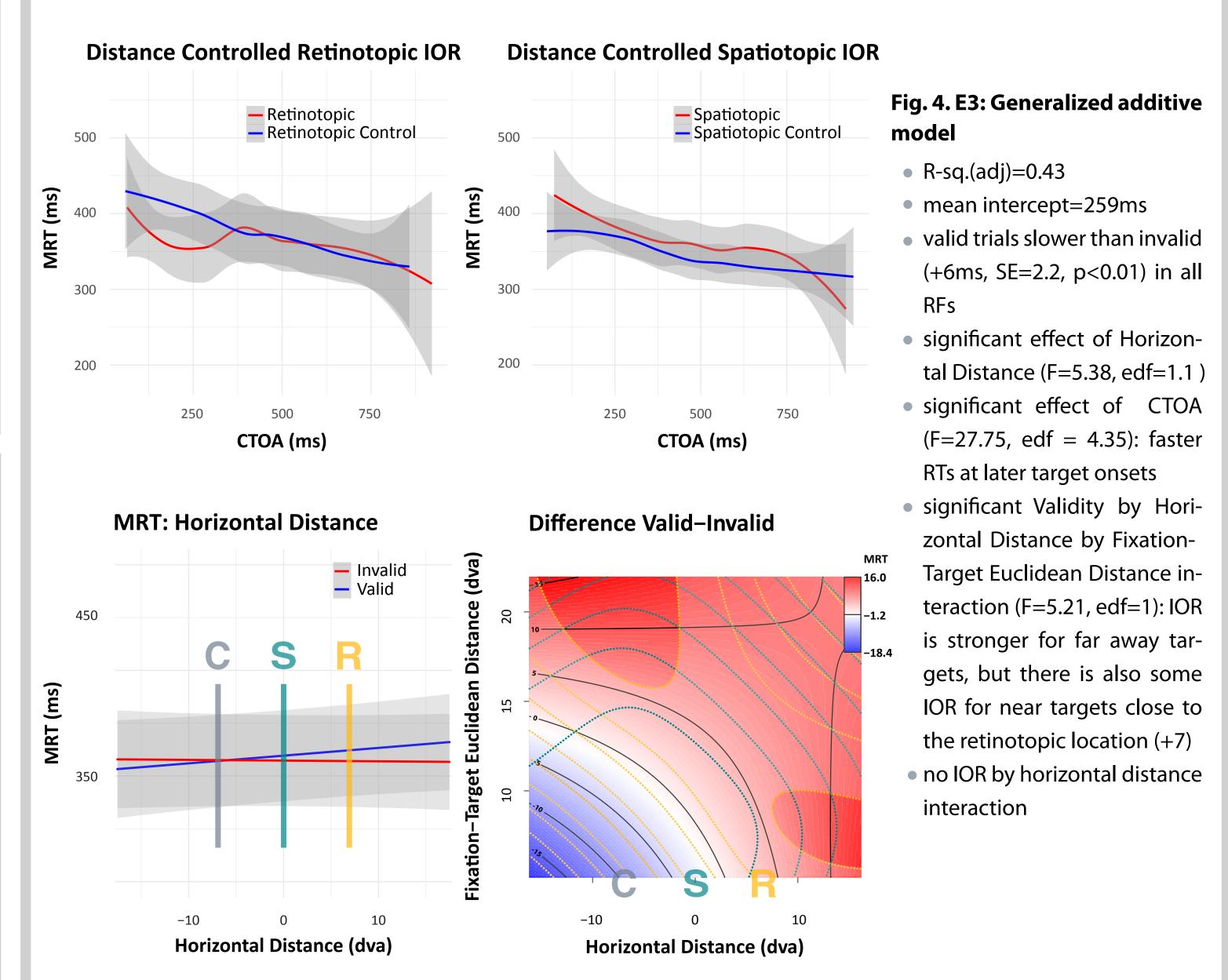
Fig. 1. E1 & E2: Target locations exactly at the potential cued locations. A. Trial with the valid location of the target in the spatiotopic reference frame. B. Control trial.

In E3 & E4 targets could appear at random locations in the upper and lower hemispheres around the cued locations.

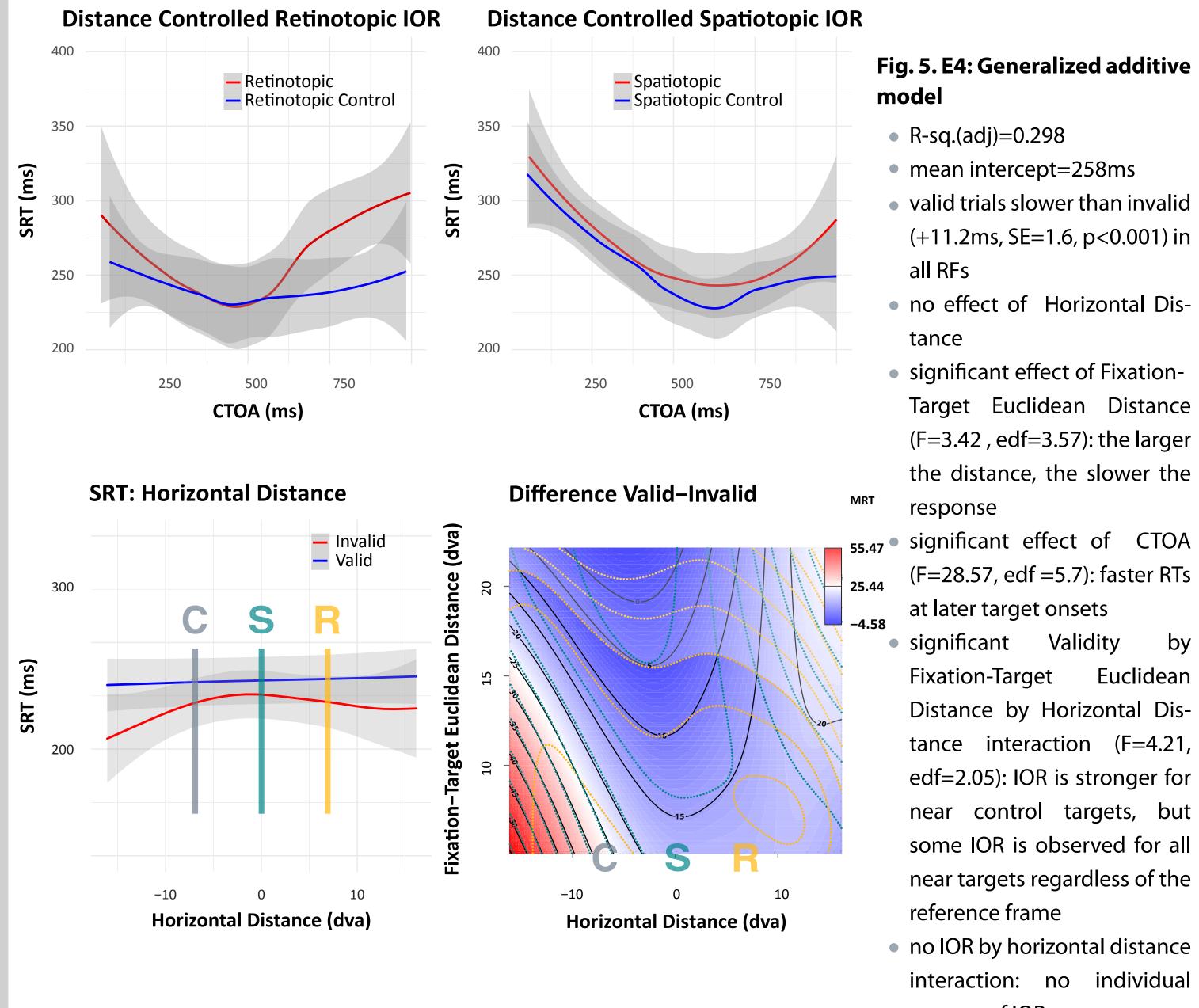
#### Results E1&E2 E1: Exact target: MRT **MRT: Reference Frame MRT: CTOA** Fig. 2. E1: Linear mixed effects model InvalidValid **⊨** Invalid mean intercept=427ms **⇒** Valid • the CTOA effect: faster RTs at later target onsets (-8ms/100ms MRT (ms) onset, SE=1.2, p<0.01) validity effect: valid trials slower than invalid (+7.1 ms, SE=2.0,p<0.01) across all RFs no effect of RF nor interaction no significant difference between early/late MRTs CTOA (ms) **Reference Frame** E2: Exact target: SRT **SRT: Reference Frame SRT: CTOA** Fig. 3. E2: Linear mixed effects model **⊨** Invalid InvalidValid mean intercept=300ms 350 • the CTOA effect: faster RTs at later target onsets (-5.2ms/100ms onset, SE=0.8, p < 0.01) validity effect: valid trials slower than invalid (+8.8ms, SE=1.5, p<0.01) across all RFs no effect of RF nor interaction 1500 no significant difference be-Reference Frame CTOA (ms) tween early/late SRTs

#### Results E3&E4

#### E3: Gradient distance: MRT



## E4: Gradient distance: SRT



# Fig. 5. E4: Generalized additive

sources of IOR

## References

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correspondence: t.v.malevich@gmail.com, jmacinnes@hse.ru

# Conclusion

No evidence for an independent source of retinotopic IOR neither at discrete locations (E1 & E2) nor as a gradient around the cued locations (E3 & E4)

There are differences between validly and invalidly cued hemifields

The entire hemifield IOR is consistently observed in all experiments, regardless of the response modality, exactness of the target location, or reference frame

The entire hemifield IOR also covers locations that are neither retintopic nor spatiotopic

These results indicate a strategy to attend and then inhibit the entire cued hemifield

Alternatively, the gradient around the spatiotopically cued location might be too large