

# How cue eccentricity affect the orienting of visuo-spatial attention

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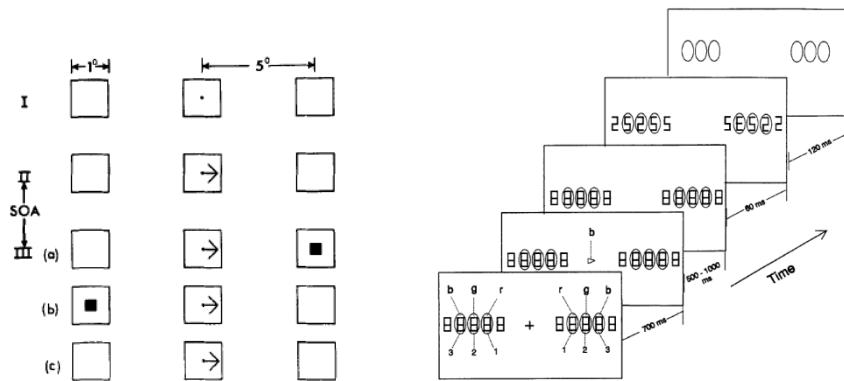
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attributed to Dan T. Smith*

# Introduction

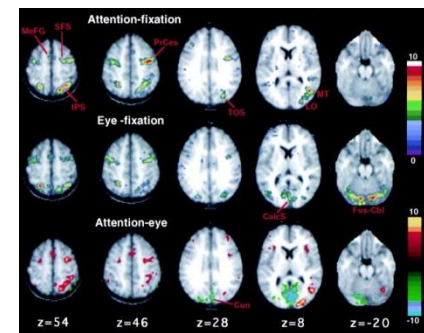
## Spatial attention & the oculomotor system

### Behavioural evidence

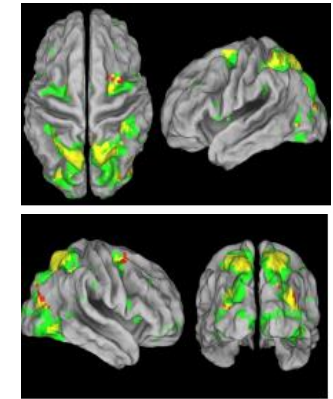


(Shepherd, Findlay & Hockey, 1986) (Deubel & Schneider, 1996)

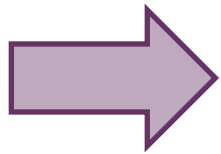
### Neuroimaging evidence



(Corbetta et al., 1998)



(de Haan et al., 2008)

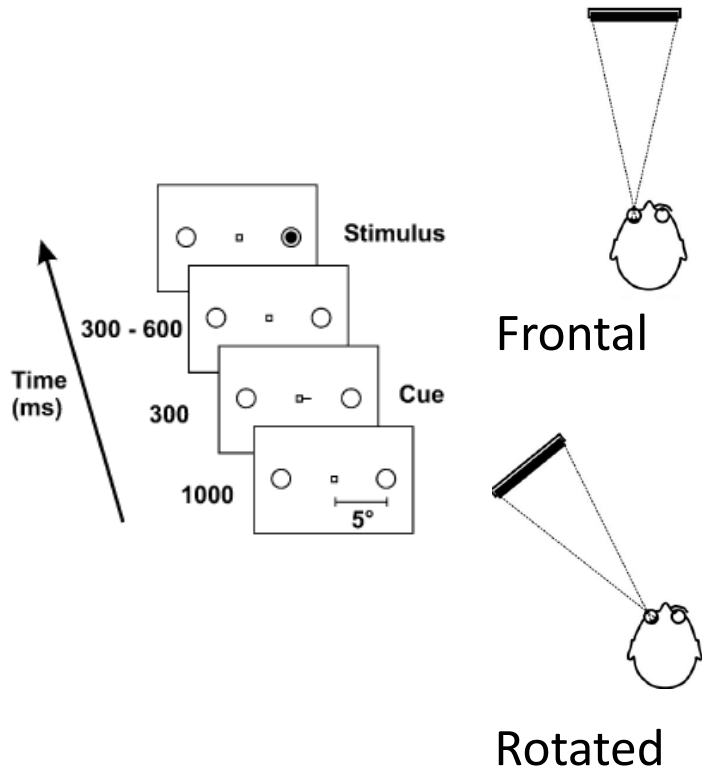


### PreMotor Theory of Attention (PMTA)

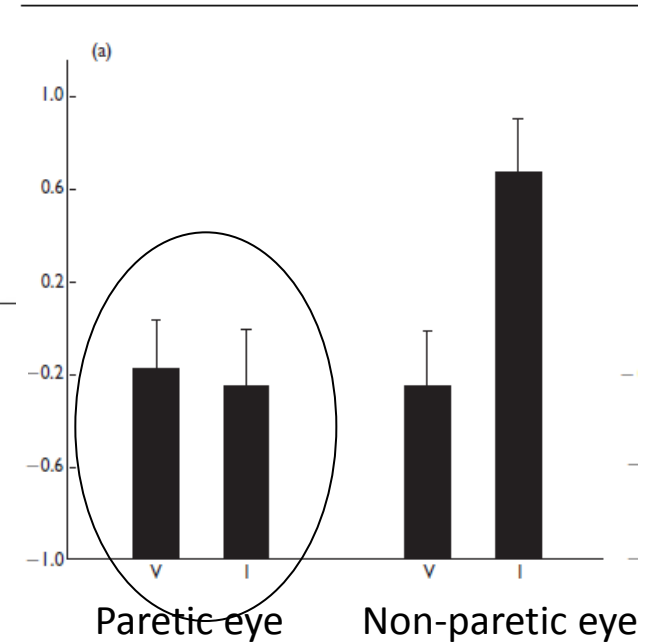
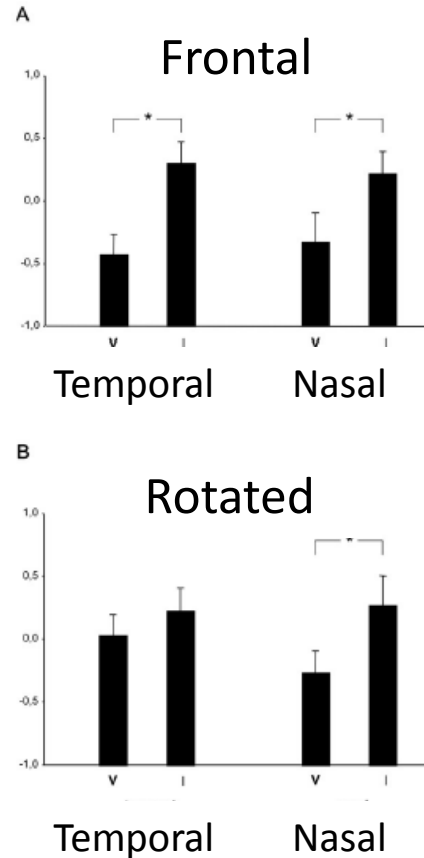
(Rizzolatti, Riggio, Dascola, & Umiltà, 1987)

# Introduction

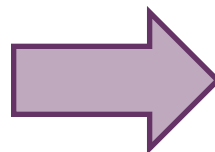
## Endogenous Shift of Attention and Saccade preparation



(Craighero, Nascimben & Fadiga, 2004)



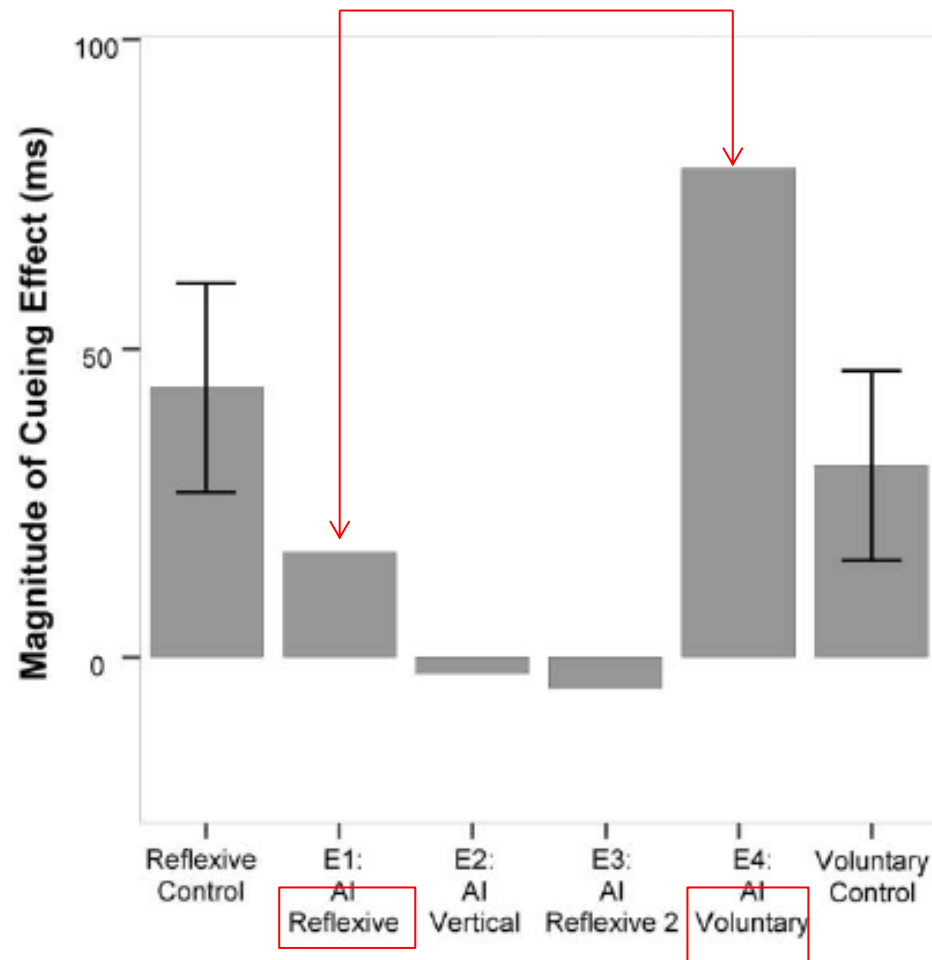
(Craighero, Carta & Fadiga, 2001)



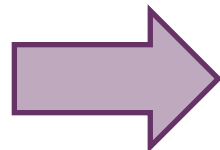
**Covert attention cannot be orientated beyond the EOMR**

# Introduction

## Exogenous Shift of Attention and Saccade preparation



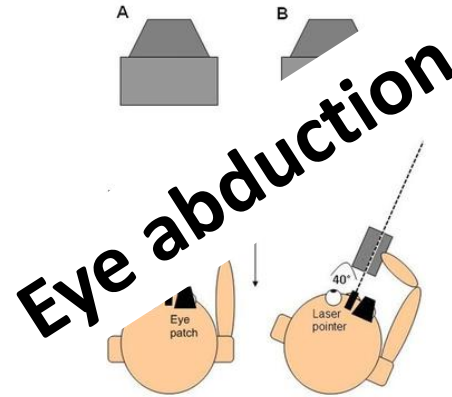
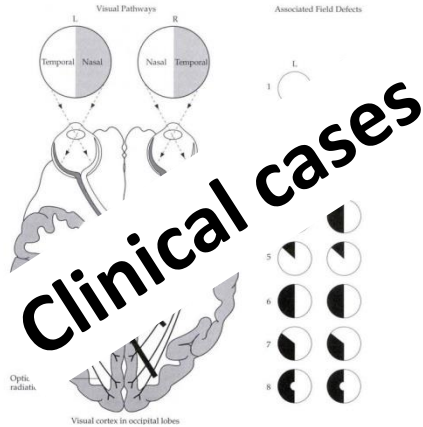
(Smith, Rorden & Jackson, 2004)



**EXOGENOUS** Covert attention cannot be orientated beyond the EOMR

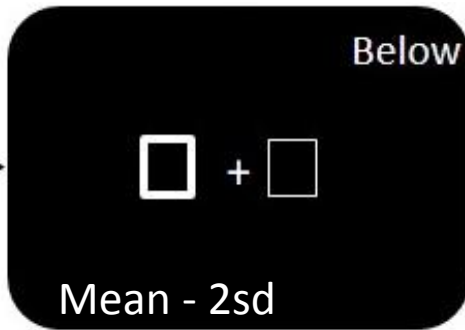
# Current studies

➔ **EXOGENOUS** covert attention cannot be orientated beyond the EOMR

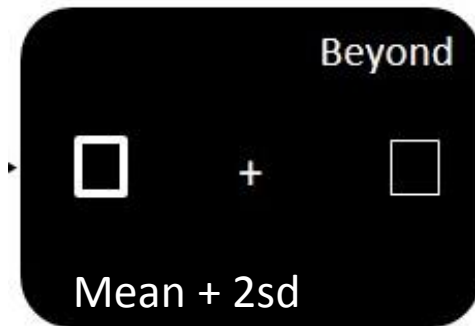
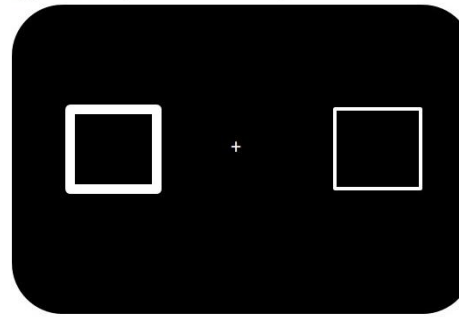


➔ Aimed at testing the assumption that exogenous covert attention cannot be orientated beyond the EOMR with (1) neurotypical participants (2) in a more natural set up (EOMR).

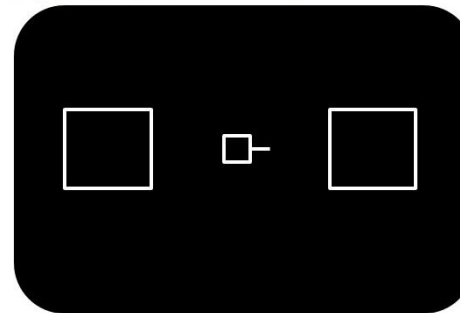
# Methods



## 1. Exogenous (50% valid trials)



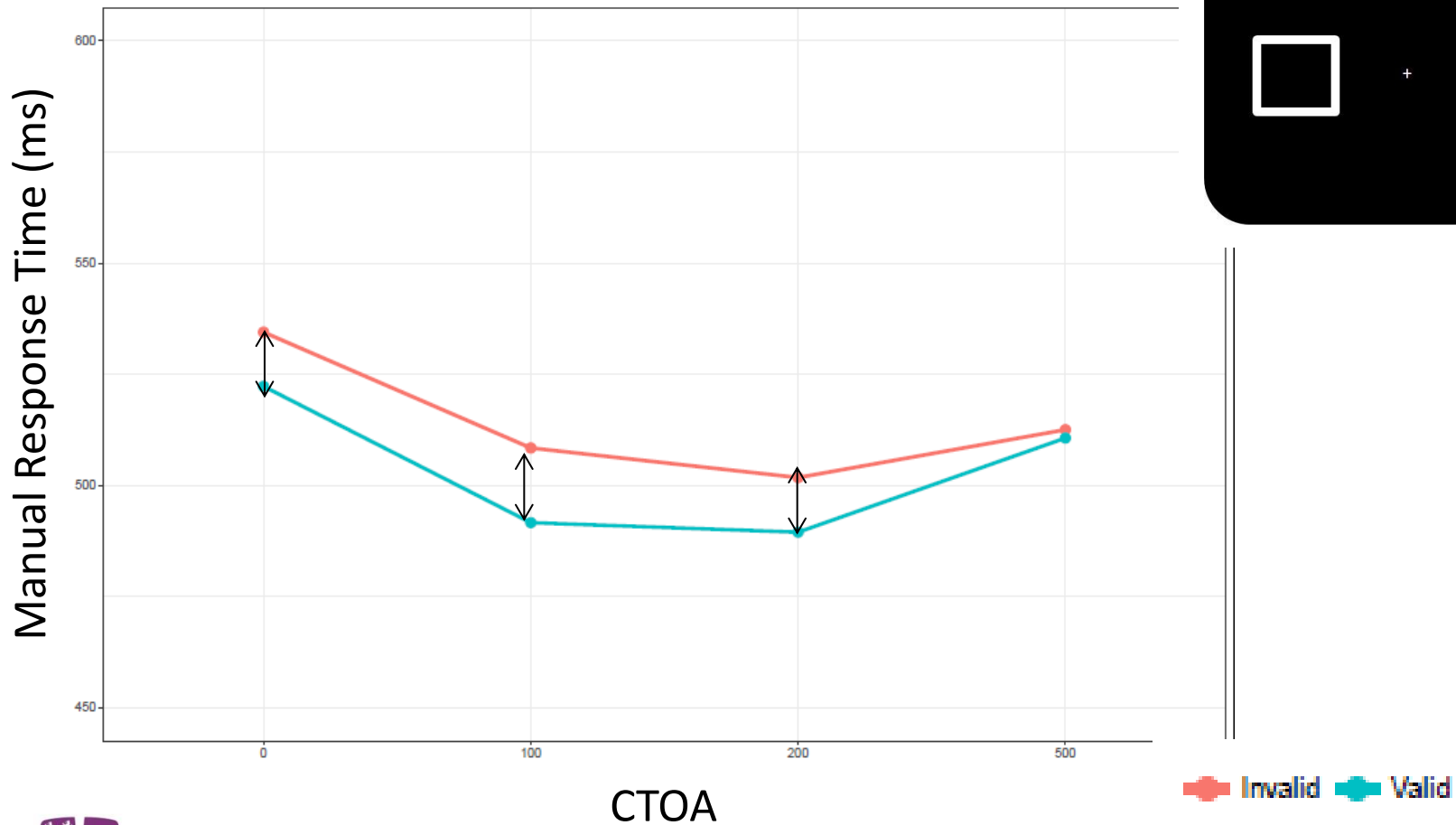
## 2. Endogenous (75% valid trials)



- ▶ **Cue eccentricity** (Below vs. Beyond) was calculated based on each participant's own EOMR
- ▶ **Cue to Target Onset Asynchrony (CTOA)** – Exp.1: 0/100/200 and 500ms Exp.2: 300 & 600ms
- ▶ Stimuli sizes were scaled according to the **Cortical Magnification Factor**

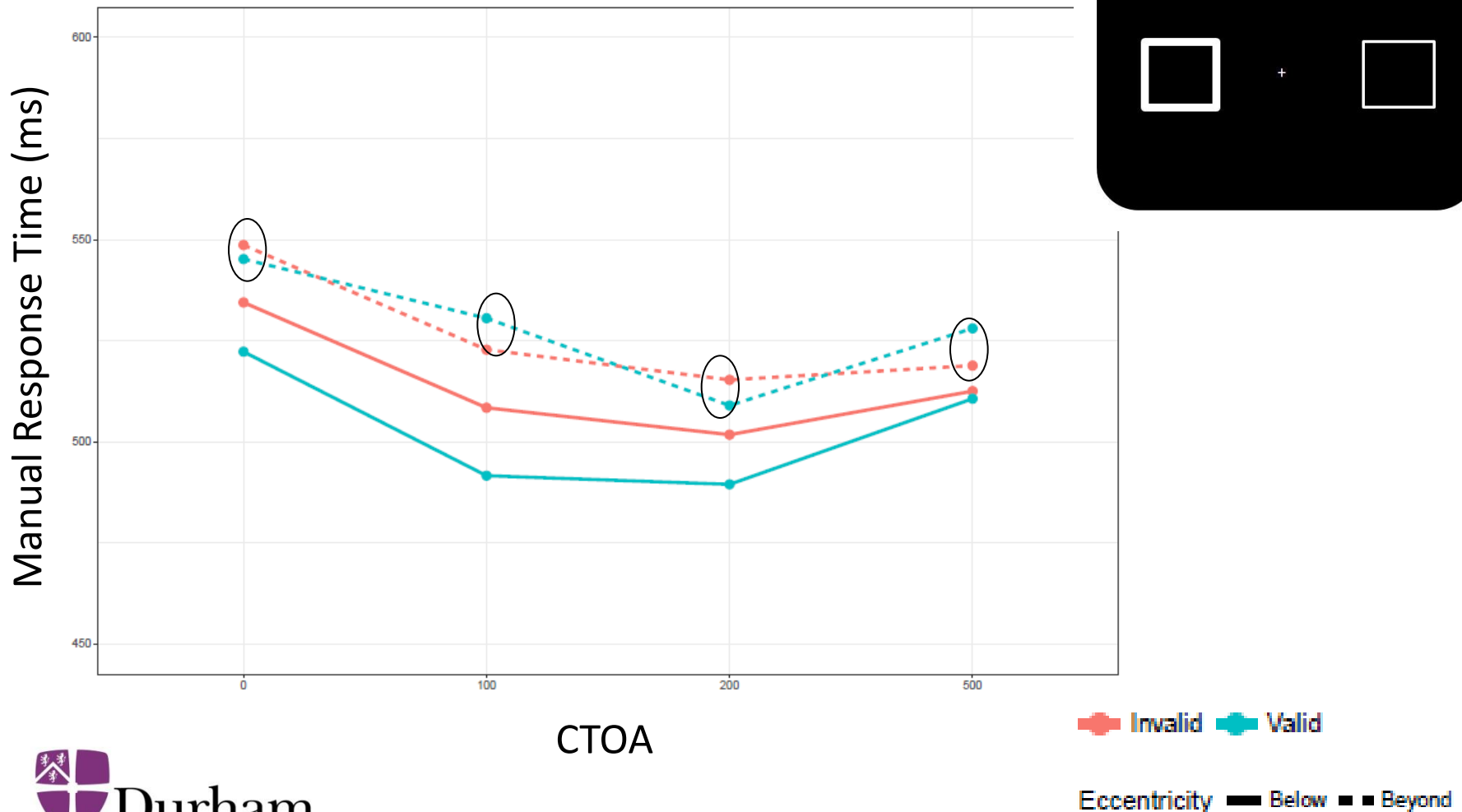
# Results (1)

## Exp.1 – Exogenous shift of covert attention



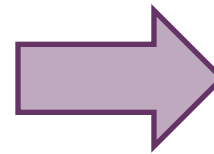
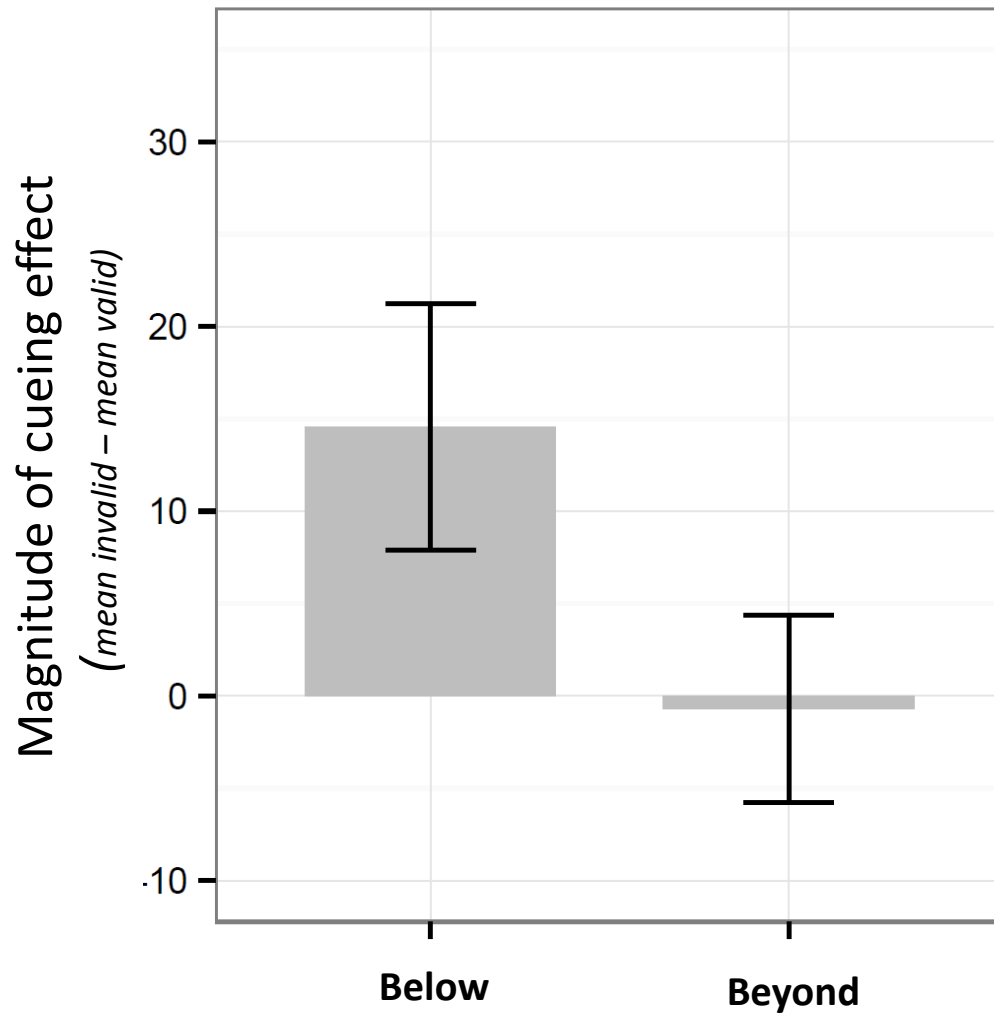
# Results (1)

## Exp.1 – Exogenous shift of covert attention

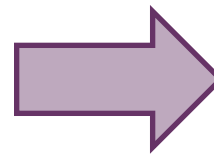




# Discussion (1)



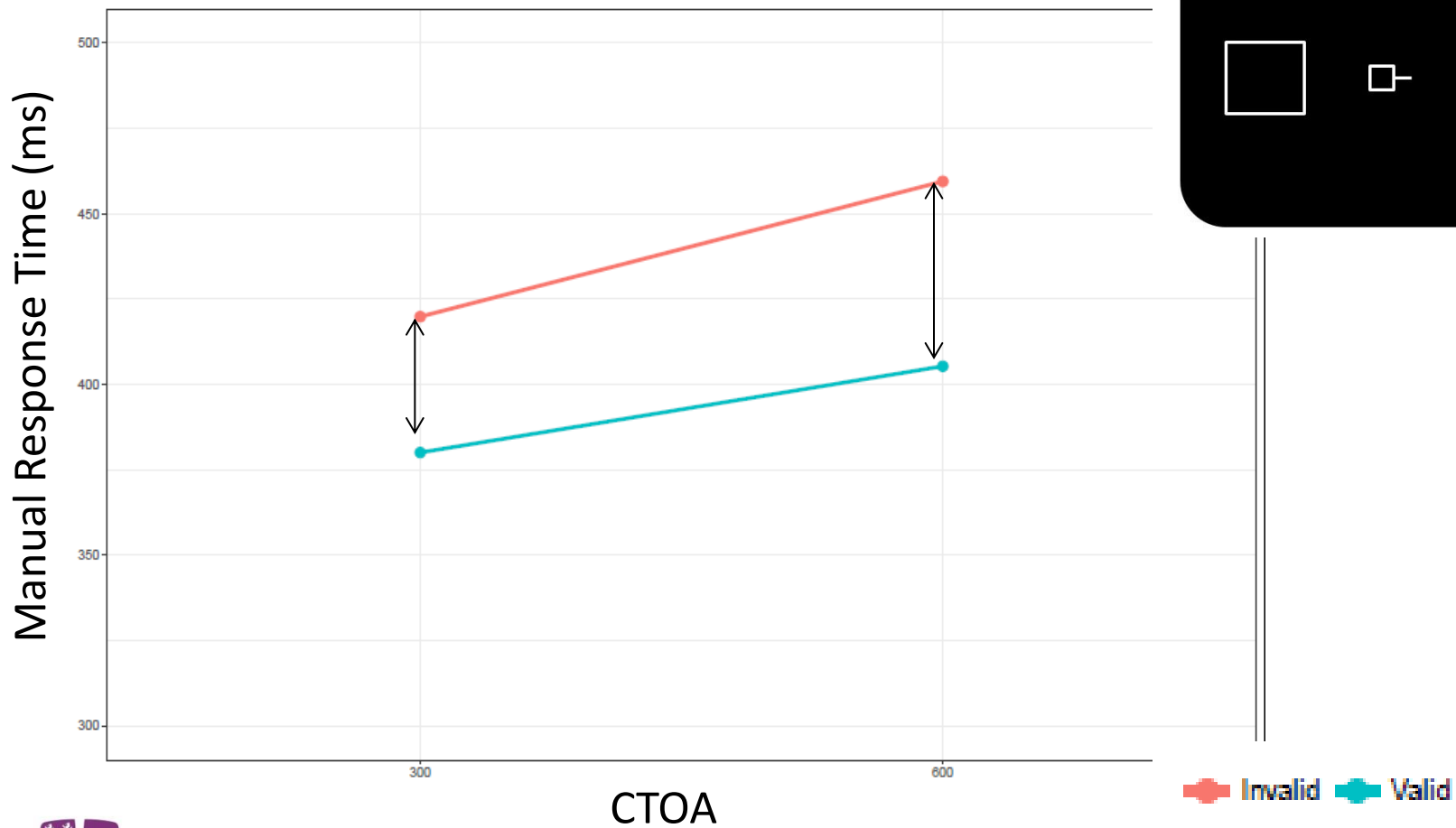
Deficit in **exogenous** shift of covert spatial attention for cues presented **beyond** the EOMR but not for cues presented below



**Exogenous attention is tightly coupled with the oculomotor system**

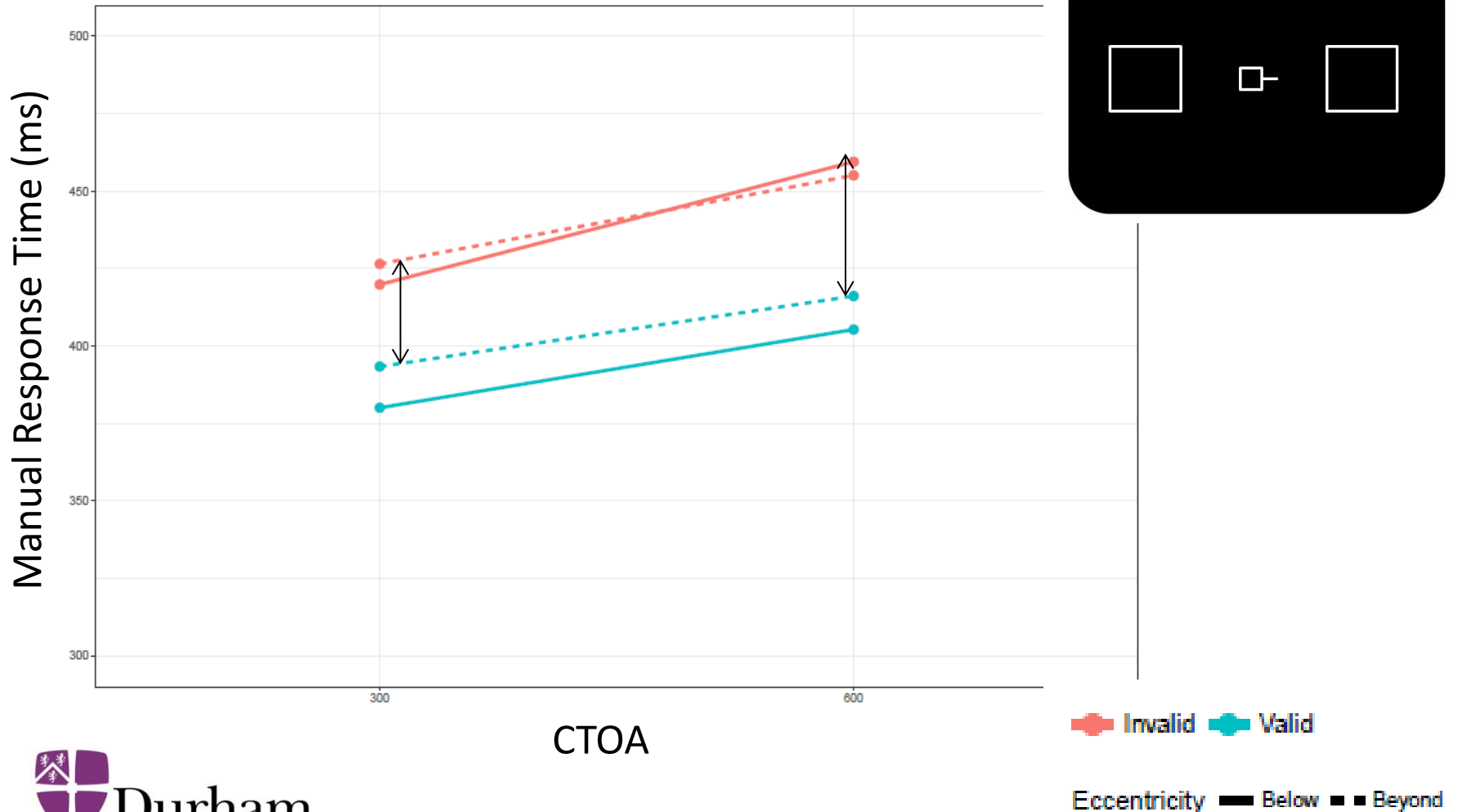
# Results (2)

## Exp.2 – Endogenous shift of covert attention



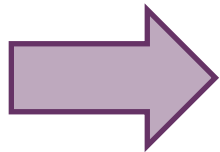
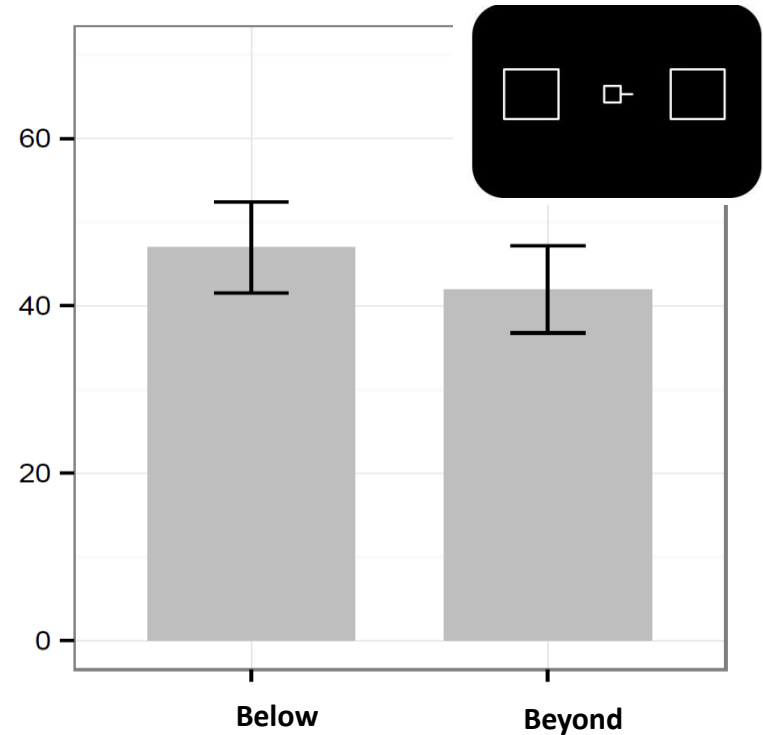
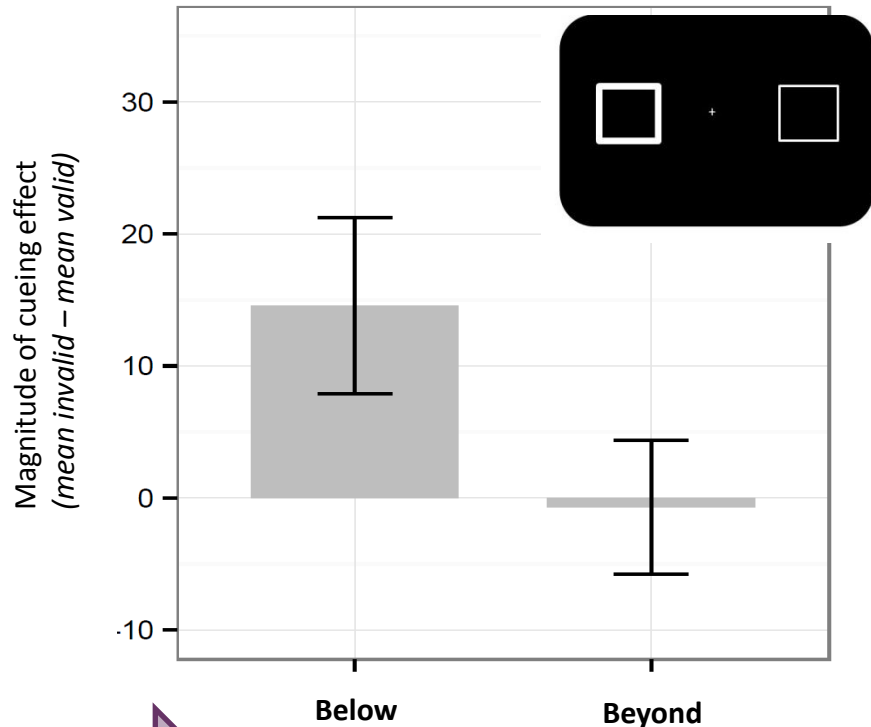
# Results (2)

## Exp.2 – Endogenous shift of covert attention

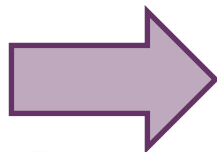


# Results - summary

## Exogenous vs. Endogenous



**Exogenous shift of attention is impaired when stimuli are presented beyond the EOMR**



**Endogenous shift of attention remains unaffected**

# Discussion

Only **Exogenous** orienting is tight to the EOMR

Only **Exogenous** orienting is coupled to the  
oculomotor system

Altogether these results are:

**Consistent with a weak version of PMTA**



**A Motor Bias Theory of Attention**  
ES/N018842/1

[www.motorbiasproject.com](http://www.motorbiasproject.com)



@AttentionLab



No, it's not cold in the UK