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## Value-driven attentional capture under time constraints

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## INTRODUCTION

- ❖ We need to avoid distraction by irrelevant stimuli to maintain a good performance (e.g., while reading, driving, etc.).
- ❖ Our ability to avoid distraction by irrelevant **salient** stimuli could be influenced by the **time constraints** of the task (e.g. vehicle speed):
  - **Less distraction under high temporal demands (Kiss et al., 2012)**
- ❖ Even when counterproductive for the task at hand, distractors associated with **rewards** receive high attentional priority because of their motivational significance (Le Pelley et al., 2016).
  - **"Value-driven attentional capture"**
  - **More distraction by high- rather than low-reward distractors**

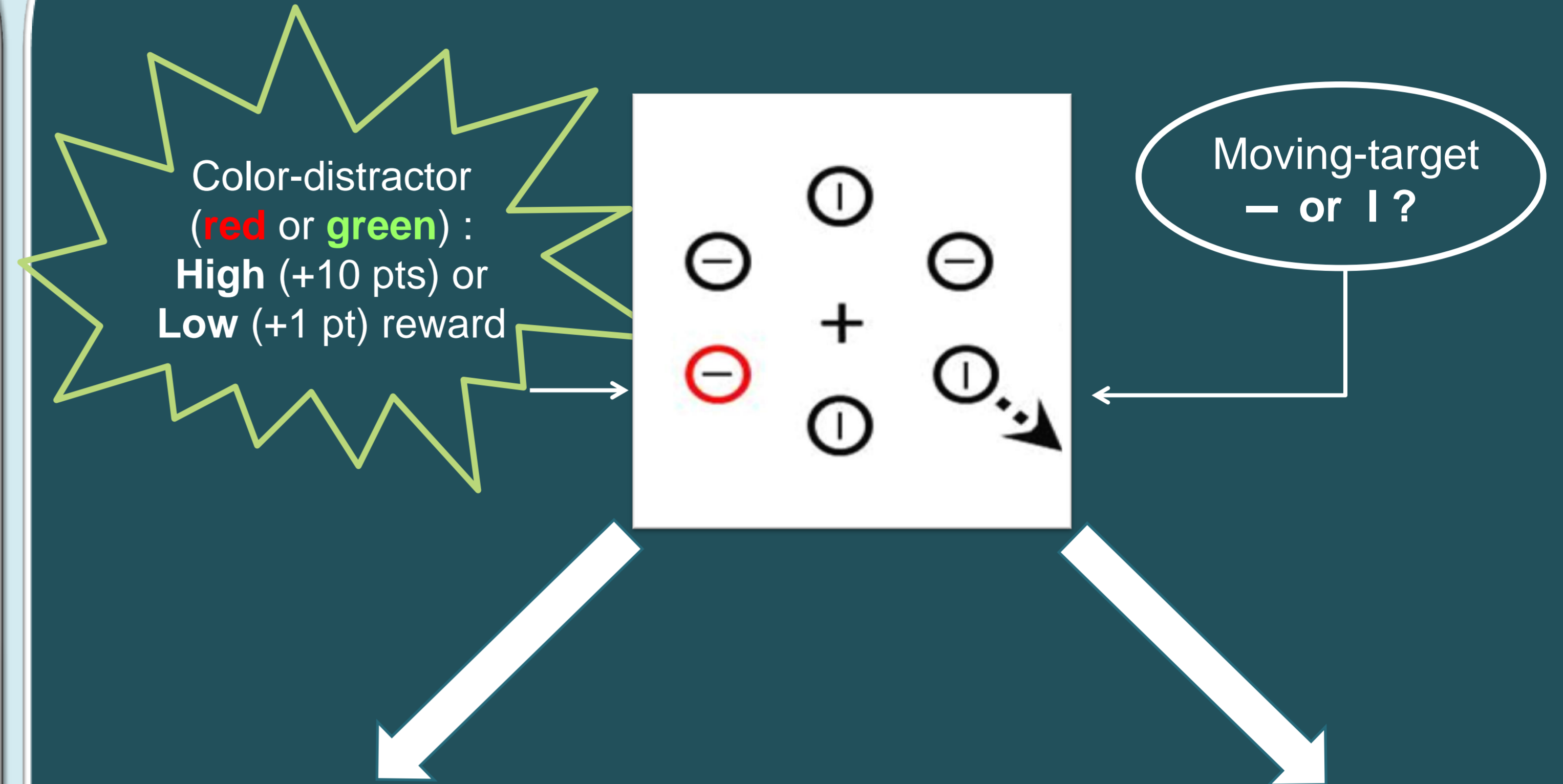
**AIM 1** To replicate the **temporal demands** effect on distraction (i.e., less distraction under high temporal demands)

**AIM 2** To investigate whether a **reward-distractor** would survive to this effect in virtue of its attentional priority.

**AIM 3** To investigate whether distraction is modulated by the relative magnitude of **reward-distractors** under high **temporal demands**.

## METHOD

- ❖ Additional singleton paradigm (Theeuwes, 1992): give the orientation of the small bar contained in the moving target



Group 1 (n=30)  
**No temporal demands:**  
Display visible until response

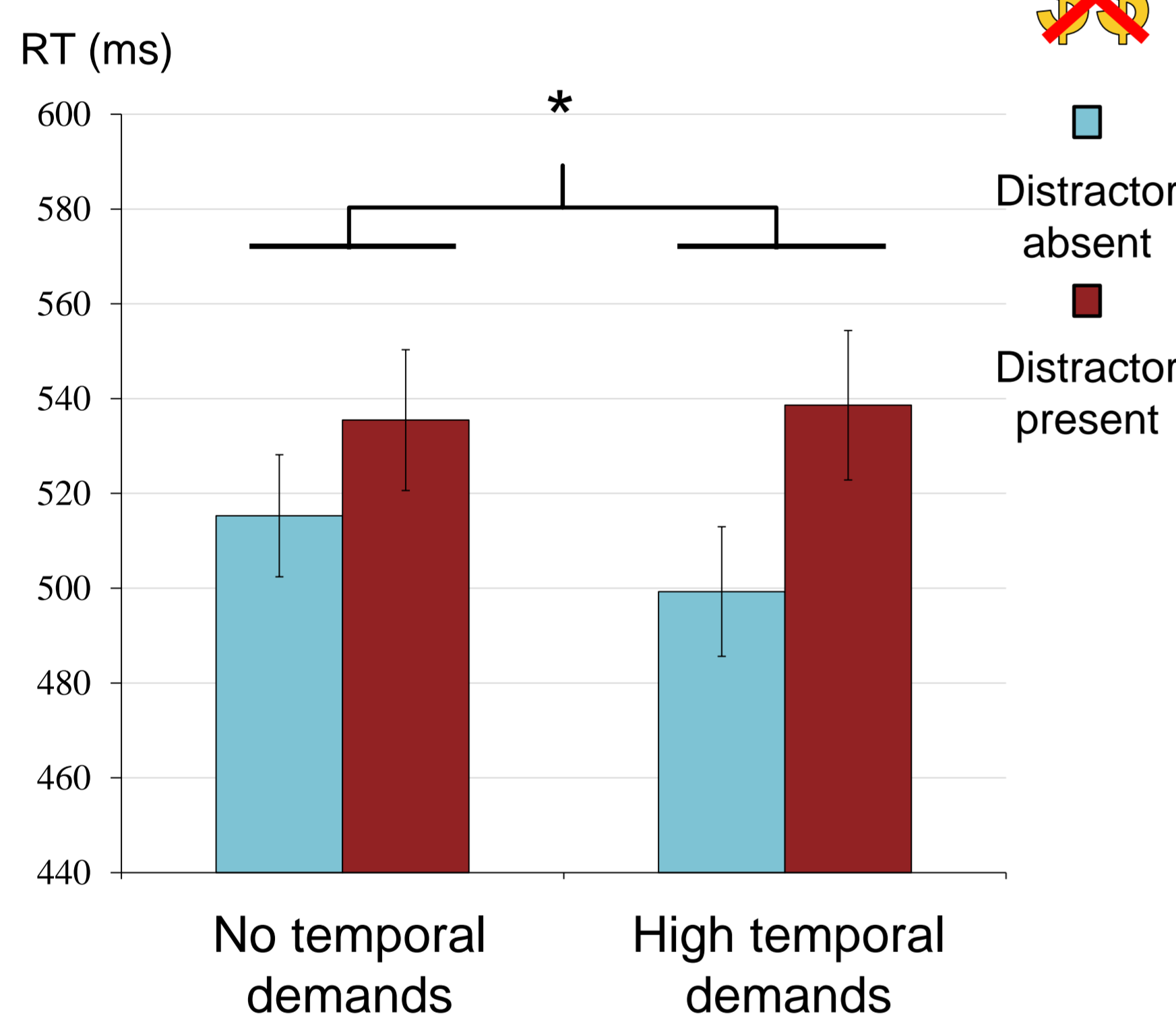
Group 2 (n=30)  
**High temporal demands:**  
Display visible only for 200 ms

- ❖ VD: Distraction (RTs distractor absent vs RTs distractor present)

+ **Control study:** same experiment without reward-outcomes ~~\$\$\$~~

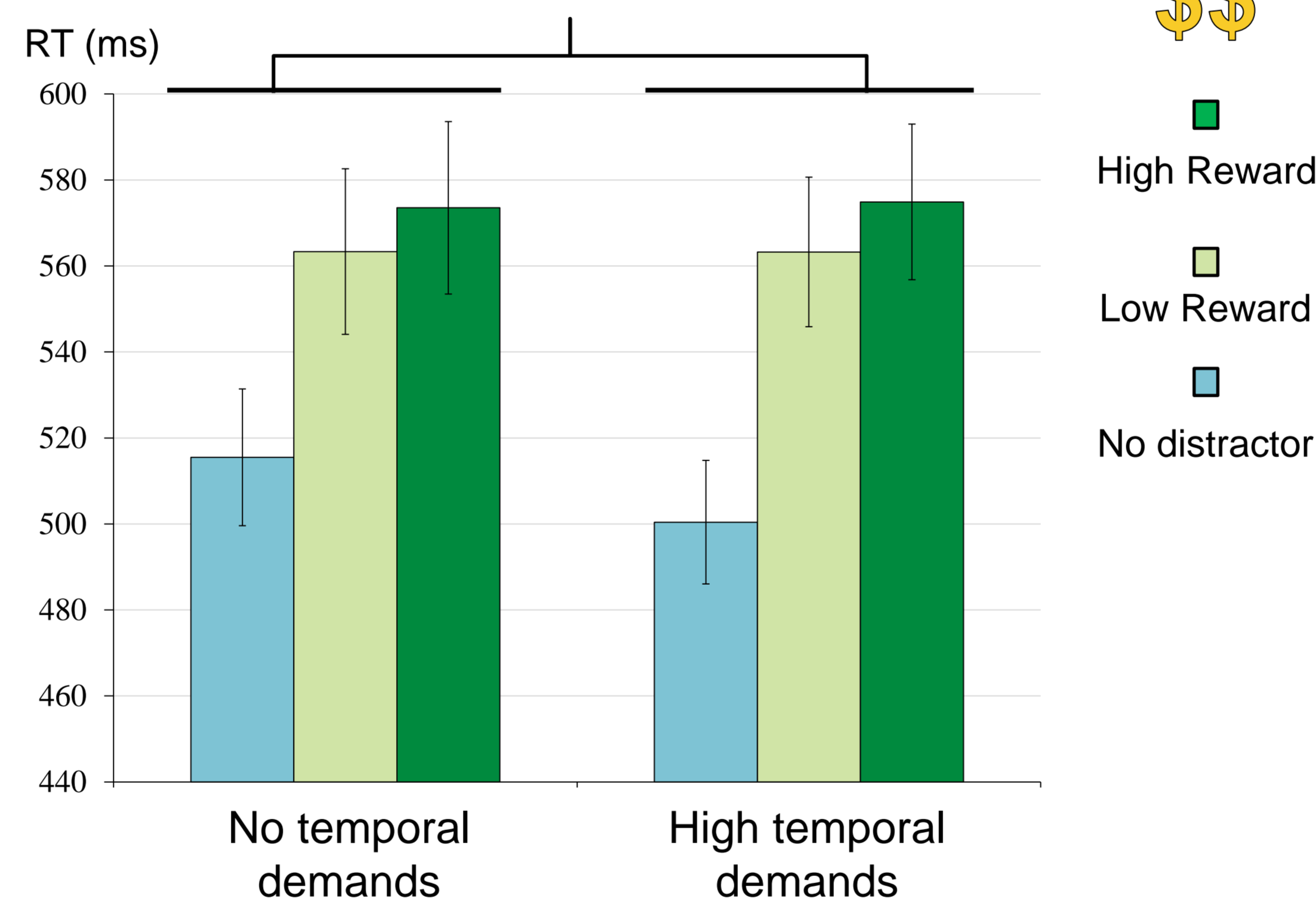
## RESULTS

### AIM 1



**Temporal demands increased distraction**

### AIM 2



**No interaction between temporal demands and distraction**

### AIM 3

High vs Low reward	p-values
No temporal demands	< .01
High temporal demands	< .01

**Distraction was also modulated by reward magnitude under high temporal demands**

## DISCUSSION

### AIM 1

- ❖ Contrary to our first hypothesis, distraction was **increased** under **high temporal demands**.

- ❖ **High temporal demands**, as sensory degradation (i.e., reduced time presentation), would increase task difficulty which in turn would increase probability of distractor intrusion (Lavie & de Fockert, 2003).

➢ Error rates: **No temporal demands** (8.3%) vs **High temporal demands** (10.5%),  $t(49) = 1.8, p = .066$

### AIM 2

- ❖ **Temporal demands** did not increased distraction by **reward-distractors** (as it was observed with threatening faces – Yao et al., 2013)

➢ "Ceiling effect" due to large distraction by reward distractor?

➢ Error rates: ~~\$\$\$~~ (9.4%) vs \$\$\$ (11.1%),  $t(98) = 1.9, p = .056$

### AIM 3

- ❖ Even when task was performed under **high temporal demands**, **high-reward distractors** produced stronger distraction than **low-reward distractors**.

- ❖ The learning of distractor-values was not impaired under time constraints.

- ❖ Value-driven attentional capture: automatic capture impervious to top-down control? (Anderson, 2013; Hickey & van Zoest, 2013; Pearson et al., 2015)