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Attentional capture by reward-distractors under perceptual load

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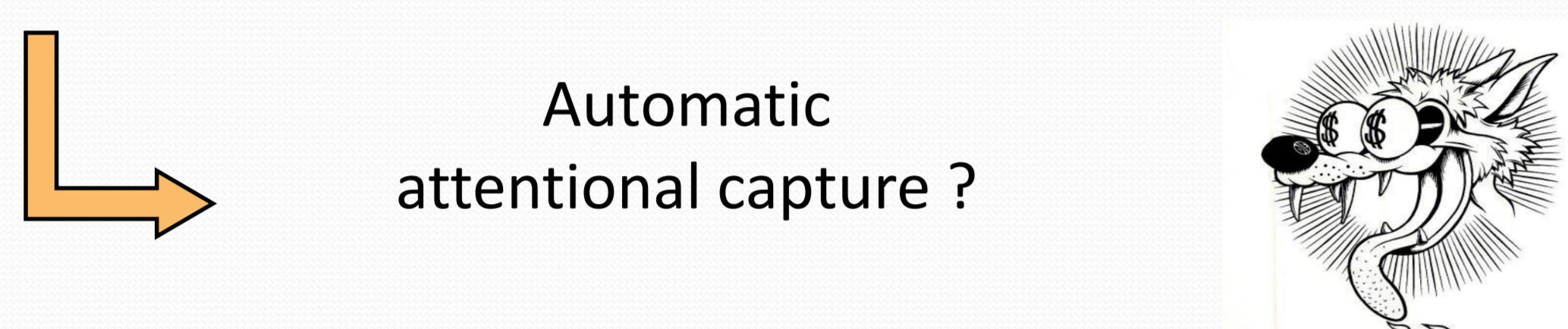
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INTRODUCTION

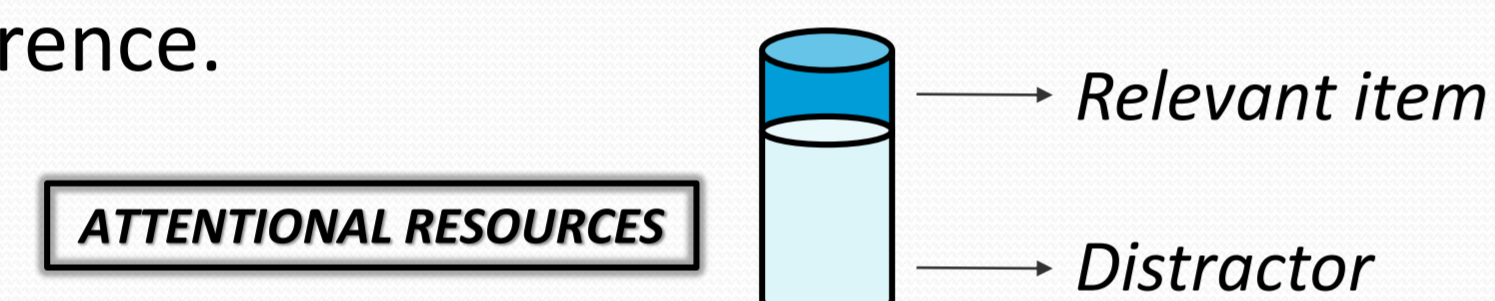
Value-Driven Attentional Capture (Anderson, 2013)

- Recent research revealed that visual distractors associated with or signaling **reward** outcomes **capture attention** in spite of being **neither salient nor relevant** for the ongoing task.

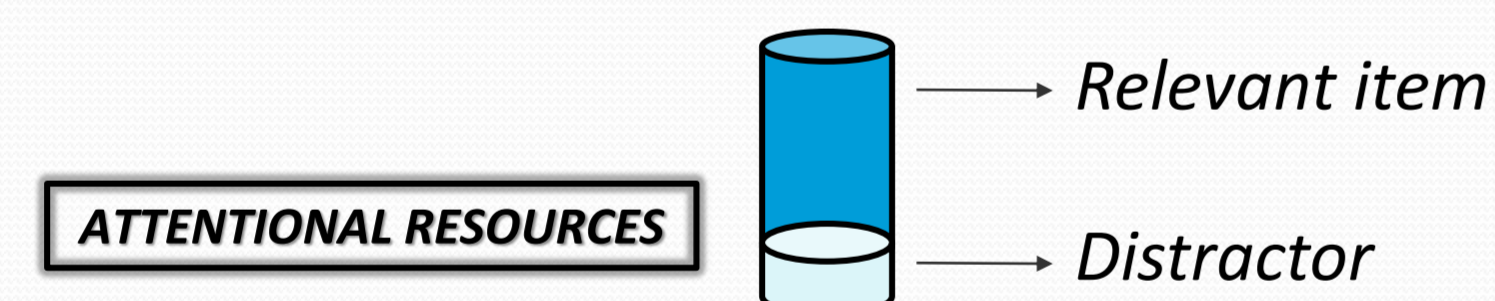


Perceptual Load Theory (Lavie, 2010)

- In situation of **low perceptual load** spare capacities from relevant processing "spills over" to the irrelevant items, resulting in distractor interference.

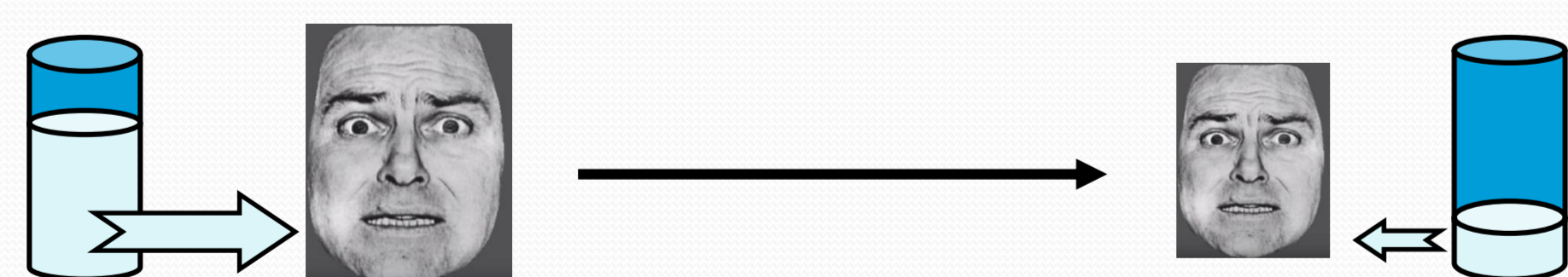


- Attentional capture by irrelevant distractors can be prevented in situations of **high perceptual load** that exhaust all available capacities in the perception of relevant stimuli.



Perceptual Load and Emotion (e.g., Silvert et al., 2007)

- Distraction by irrelevant **fearful faces** is reduced under high load.



- Processing of irrelevant **negative** emotional stimuli depends on available attentional resources.

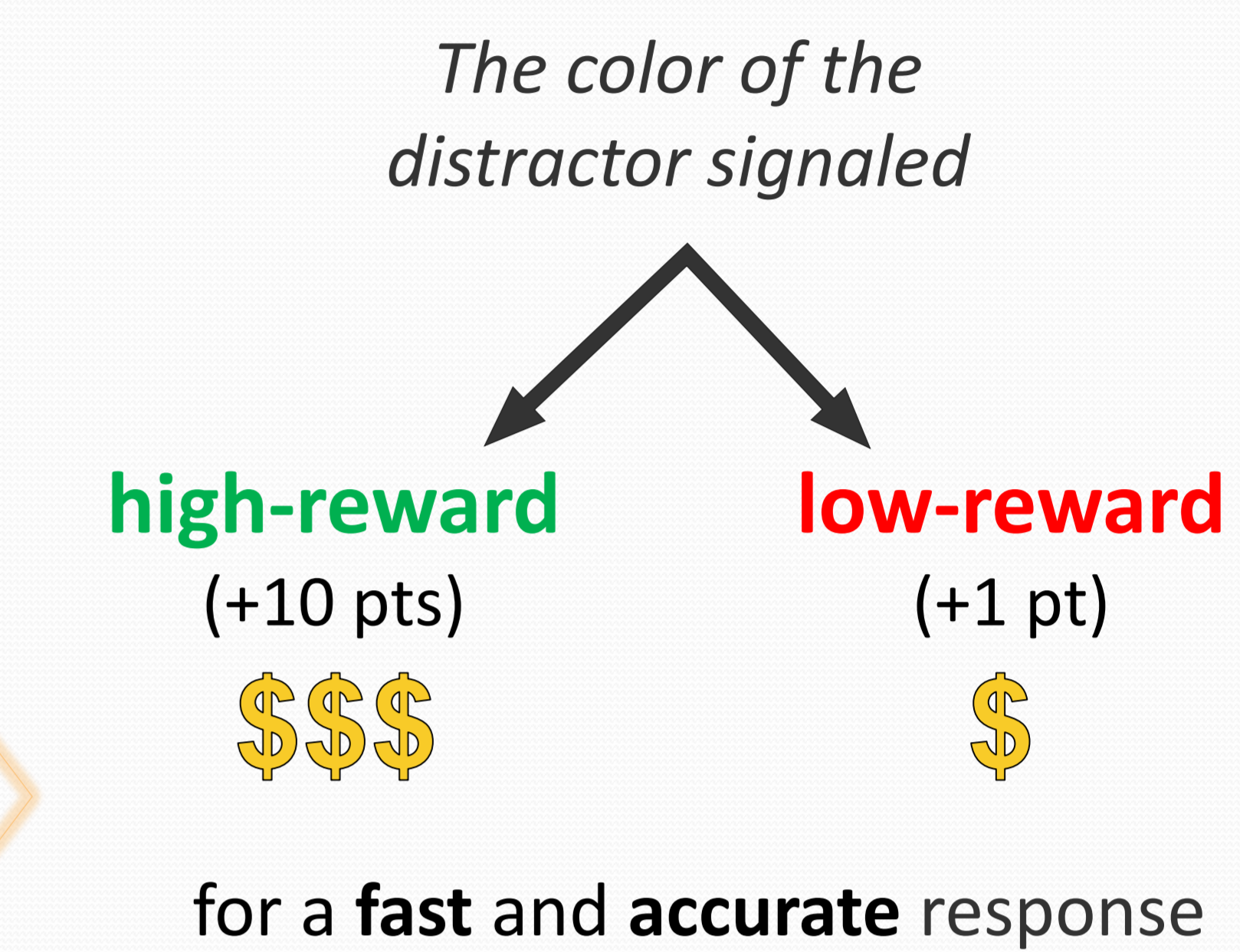
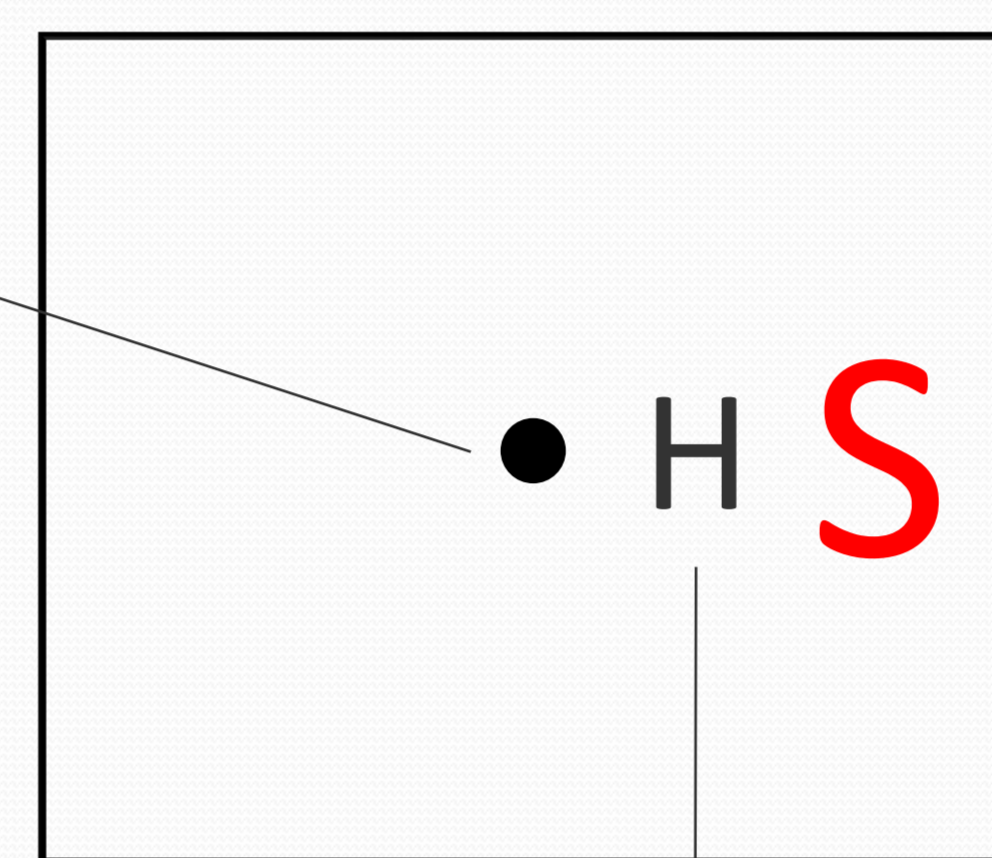
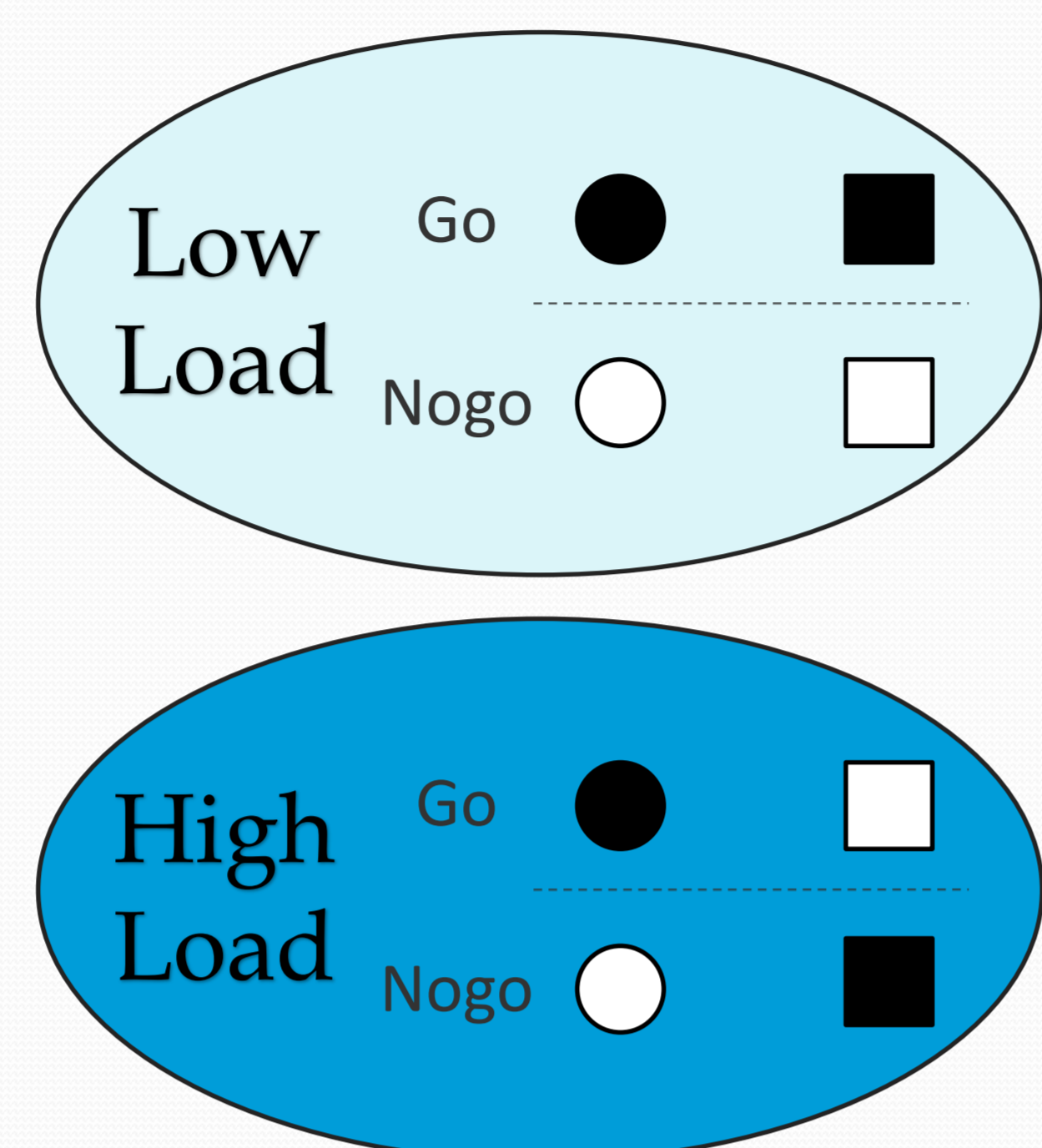
Perceptual Load and Reward ?

- If attentional capture by reward distractors is automatic, therefore, interference by reward distractors should be immune to perceptual load manipulations.



METHOD

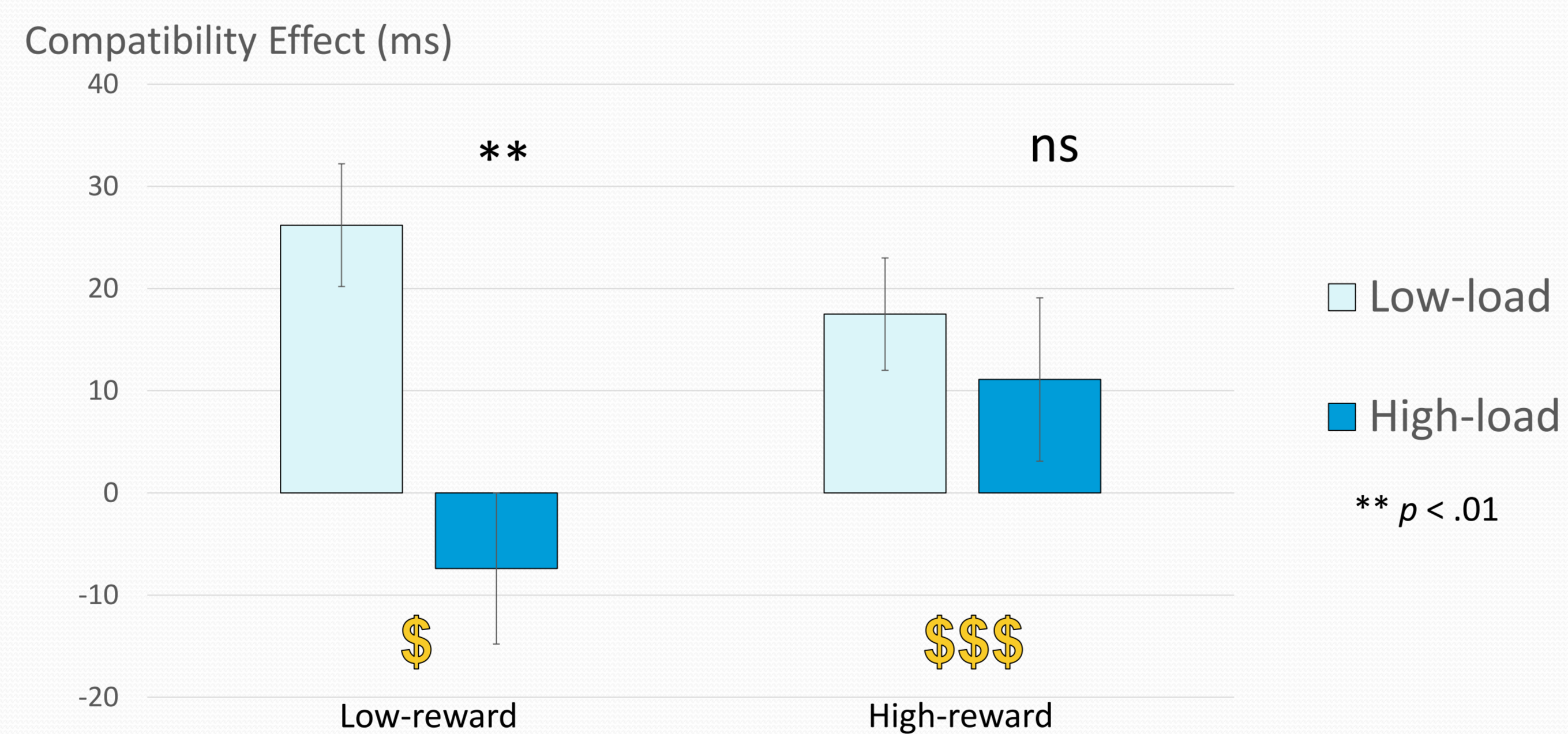
Load manipulation: Feature vs. Conjunction search (Chen & Cave 2016)



In an adaptation of a go/nogo task, participants had to identify the target letter (H or S) depending on the cue displayed, while ignoring the presence of a distractor color letter that could be either identical to (compatible) or different from (incompatible) the target.

VD: **Compatibility Effect** = RT incompatible (different) – RT compatible (same) distractor letter

RESULTS



Compatibility Effect: *Reward* (Low; High) x *Load* (Low-load; High-load)

- Reward: $F(1, 29) = 1.23, p = .28$
- Load: $F(1, 29) = 5.09, p < .05$
- Reward x Load: $F(1, 29) = 4.37, p < .05$

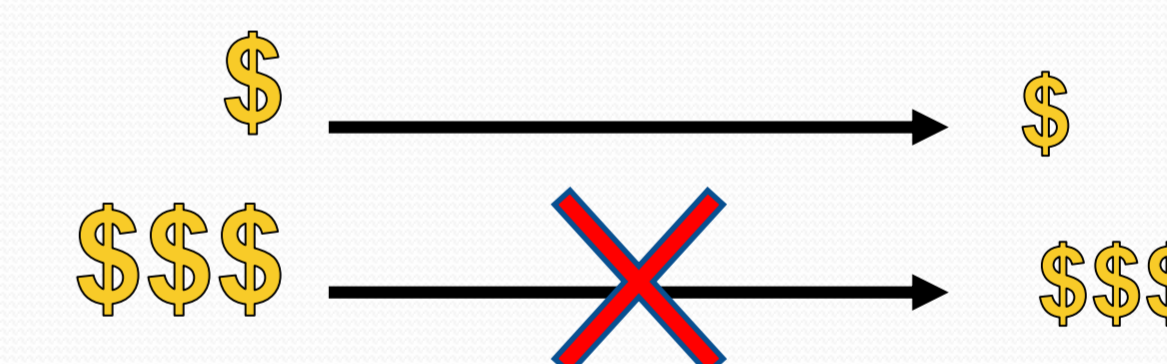
Errors: *Reward* (2) x *Load* (2)

- Reward $p < .01$
- Load $p < .001$ → confirming load manipulation
- Reward x Load $p < .05$

High perceptual load only eliminated low-reward distractor interference whereas high-reward distractor interference seems « immune » to load manipulation.

DISCUSSION

- High perceptual load reduces low but not high-reward peripheral distractor interference.



- High-reward distractor interference was observed despite low level of free residual attentional resources (i.e., high perceptual load)

Automatic attentional capture

- At odds with what is observed for fearful faces distractors.
- Valence effect** (with reward as positive events and fearful faces as negative events) might explain those discrepant results.

- Interference by centrally presented distractor of *negative* but not *positive* valence is reduced under high perceptual load (Gupta et al., 2016).
- Growing body of studies demonstrating an advantage for positive over negative emotional information in attracting and capturing attention (e.g., Srivastava & Srivastava, 2010).

- However, the persistence of the interference effect for high reward distractors may be due to the ability of those stimuli to *capture* attention, but also to *hold* attention once it has been captured, or both.

EEG study in progress...