



Effects of stimulus energy on the attentional blink

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Background

- The attentional blink effect is commonly attributed to high level visual processes.
- Newer evidence suggests that low level processes contribute to the blink^{1,2}.

$$\text{Stimulus energy} = |\text{contrast} \times \text{exposure duration}|$$

- How does changes in stimulus energy of all elements in the RSVP affect the AB?

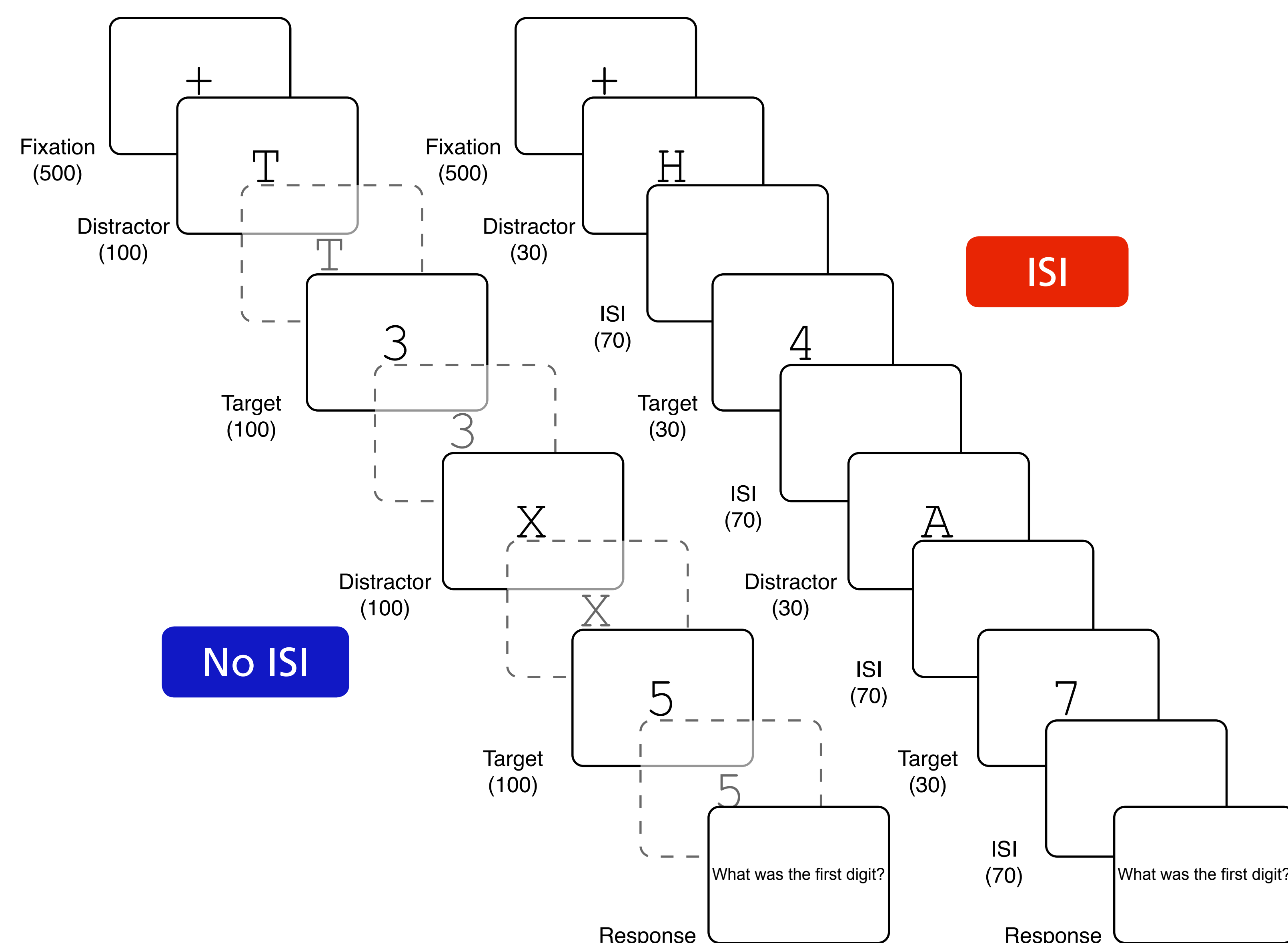
Question: Does stimulus energy modulate the blink?

Experiment 1

Task: Standard attentional blink task.
Stimuli: Digit-targets amongst letter-distractors in high contrast RSVP.
Timing: SOA of 100 ms in all trials.

Two conditions

- No ISI condition:** Exposure duration is 100 ms.
- ISI condition:** Exposure duration is 30 ms and ISI is 70 ms.

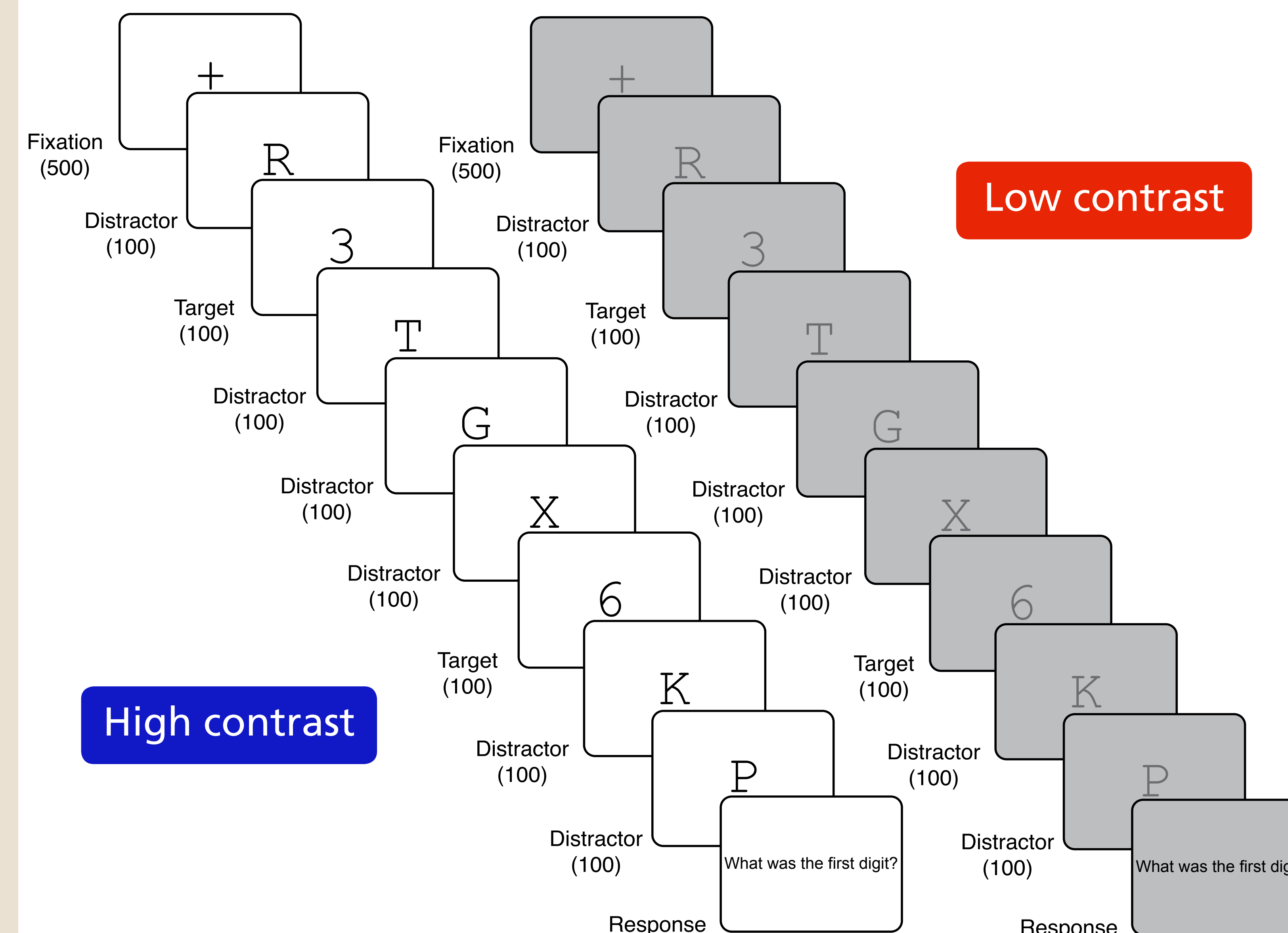


Experiment 2

Task: Standard attentional blink task.
Stimuli: Digit-targets amongst letter-distractors in RSVP.
Timing: Exposure duration and SOA is 100 ms in all trials.

Two conditions

- High contrast condition:** Black on white ($C_w = 0.99$).
- Low contrast condition:** Dark grey on light grey ($C_w = 0.27$).



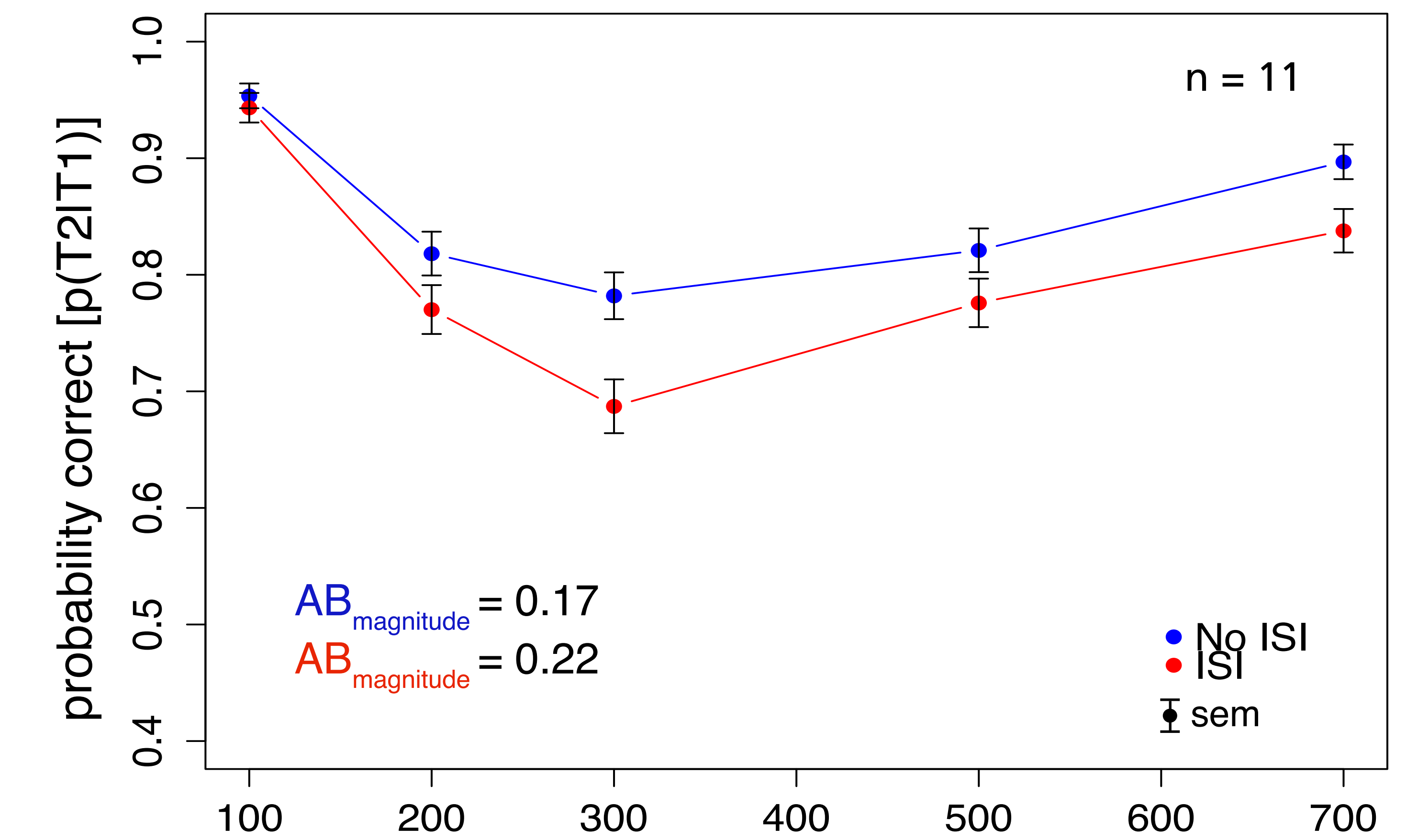
Analysis

- Blink magnitude (AB_{mag}) was calculated by dividing the area above mean $p(T2|T1)$ with the maximum possible blink area.
- Repeated measures ANOVAs of $\arcsin[p(T2|T1)]$ revealed a significant main effect of lag in both experiments ($p < 0.001$).
- Main effects of condition were also significant in both experiments:

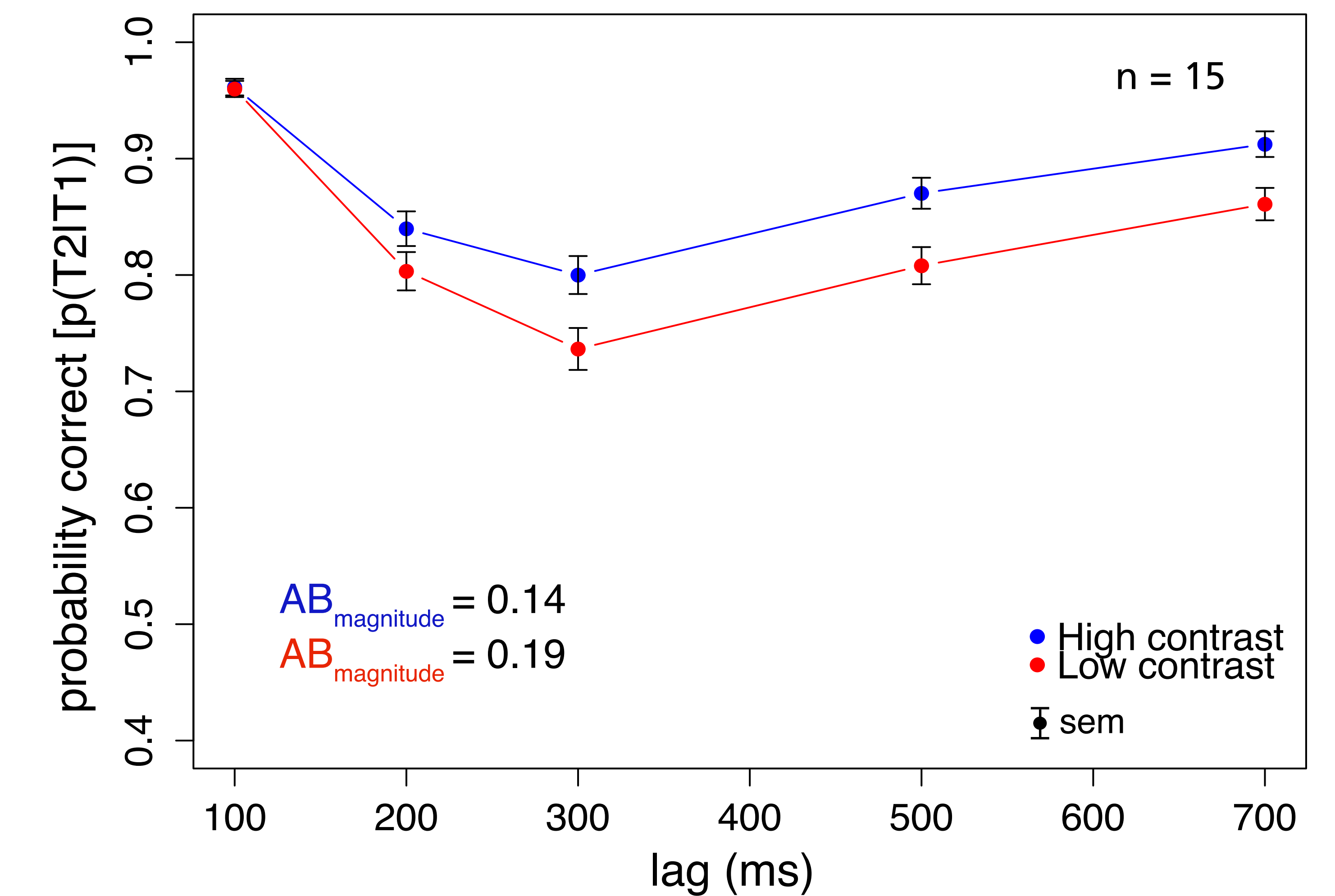
- Experiment 1 (ISI) : $p = 0.029$
- Experiment 2 (Contrast): $p = 0.038$

Results

Experiment 1: ISI



Experiment 2: Contrast



Conclusion

- Blink magnitude increases with decreased exposure duration.
 - Blink magnitude increases with decreased contrast.
- ∴ Blink magnitude increases with decreased stimulus energy.

Answer: Stimulus energy modulates the blink.

References

- Giesbrecht B., Bischof W. F., & Kingstone A. (2004). *Brain and Cognition*. 55, 307-309.
- Chua F. K. (2005). *Perception and Psychophysics*. 67 (5), 770-788.

