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.
- 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
1. **No ISI condition:** Exposure duration is 100 ms.
2. **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
1. **High contrast condition:** Black on white ($C_w = 0.99$).
2. **Low contrast condition:** Dark grey on light grey ($C_w = 0.27$).

Results

1. Blink magnitude increases with decreased exposure duration.
2. Blink magnitude increases with decreased contrast.

∴ Blink magnitude increases with decreased stimulus energy.

Conclusion

1. Blink magnitude increases with decreased exposure duration.
2. Blink magnitude increases with decreased contrast.
3. Blink magnitude increases with decreased stimulus energy.

**Answer:** Stimulus energy modulates the blink.

References


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

Stimulus energy = | contrast x exposure duration |