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.\(^1\),\(^2\)
- 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.

Analysis

- Blink magnitude (AB\(_{\text{mag}}\)) 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

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).

Analysis

- Stimulus energy = | contrast x exposure duration |
- AB\(_{\text{mag}}\) = 0.17
- AB\(_{\text{mag}}\) = 0.22
- AB\(_{\text{mag}}\) = 0.14
- AB\(_{\text{mag}}\) = 0.19

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