Effects of stimulus energy on the attentional blink

Lunau, Rasmus; Bundesen, Claus

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Effects of stimulus energy on the attentional blink
Rasmus Lunau & Claus Bundesen
Center for Visual Cognition, University of Copenhagen, Copenhagen, Denmark

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.

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.
∴ 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 |