T1 difficulty modulates the attentional blink only when T1 is unmasked: Implications of attentional capture in the attentional blink!

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Introduction

- We use the two-target paradigm and examine bottleneck predictions of how T1 difficulty affects the attentional blink
- Bottleneck theories suggest that making T1 easier to perceive should clear second stage processing faster resulting in a reduced attentional blink
- Previously we found no effect from varying T1 contrast or T1 duration, but proposed that the effect may have been confounded by involuntary attention directed to the mask
- In a new study we vary T1 contrast and examine the effect on the attentional blink when T1 is masked compared to when T1 is unmasked

Method

- **Stimuli**
  - 20 letter targets presented at equal frequency
  - Randomly generated dot pattern masks
  - Masks presented 100 ms after targets
- **Main variables**
  - T1 masking [Masked, Unmasked]
  - SOA [100, 200, 300, 400, 600]
  - T1 difficulty [Hard, Easy]
- **Instructions**
  - Report identity of T1 and T2
  - Guess if uncertain

Findings

- Proportions of correct report are plotted as function of SOA
- Proportions were arcsine transformed and analyzed with repeated measures ANOVAs
- T2 main effect of SOA in Experiment A and B indicates an attentional blink
- Experiment A – T1 masked:
  - % Main effect (T1 difficulty) \(F(1,17) = 0.73, p = 0.41\)
  - % Interaction effect (SOA x T1 difficulty) \(F(4,68) = 1.24, p = 0.30\)
- Experiment B – T1 unmasked:
  - % Main effect (T1 difficulty) \(F(1,17) = 0.60, p = 0.45\)
  - % Interaction effect (SOA x T1 difficulty) \(F(4,68) = 8.03, p < 0.001\)
  - Main effect (T1 difficulty, SOA = 200 ms) \(F(1,17) = 25.90, p < 0.001\)

Preliminary conclusion*

- Varying T1 difficulty by target contrast modulates the attentional blink only when T1 is unmasked
- Contrary to bottleneck predictions we observed that making T1 easier to perceive increases the magnitude of the attentional blink
- We suggest that this finding indicates capture of involuntary attention which increases with contrast
- Similarly we suggest that involuntary attention directed towards T1’s mask confounded the effect of T1 difficulty in Experiment A
- *Inference is based on a single significant data point. In follow up experiments we examine if the effect observed in Experiment B is modulated by properties of T1