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Its Snowing: A New Outlook on Motion-Induced Blindness

It's Snowing: A New Outlook on Motion-Induced Blindness

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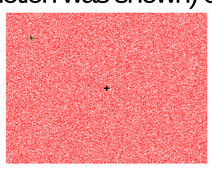
BACKGROUND

- Motion-induced blindness (MIB) occurs when a stationary part of the visual field perceptually disappears when, in fact, the stimulus is still present.
- It has been established that motion, per se, is not necessary in order to elicit motion-induced blindness and that it can occur, for example, with a collection of lights getting brighter or darker in unison [1].
- Motion-induced blindness is not yet fully understood and various theories have been offered in an effort to explain it [1, 2, 3, 4, 5].
  - The current study aimed to investigate the effects of visual noise and background color to analyze and contrast the validity of two opposing theoretical ('attentional' and 'perceptual filling-in') explanations for motion-induced blindness.
  - Attentional theory: moving objects capture attention and prevent attention from being paid to the target
  - Perceptual filling-in theory: with prolonged exposure, the target perceptually fades and is perceptually replaced with the surrounding background

METHOD

- 32 undergraduates participated in this study.
- Participants viewed 12 visual displays from 2 meters away, one visual display at a time.
- Participants stared at a central black cross, but attended a green dot in the upper-left quadrant of the display.
  - Participants held down a button when they noticed the green dot perceptually disappear.
- The displays shown to participants were either:
  - Static (in which no change or motion was shown) or dynamic (in which the pixels randomly changed).
  - Black, blue, or red (and white).
- The green dot was the MIB target.



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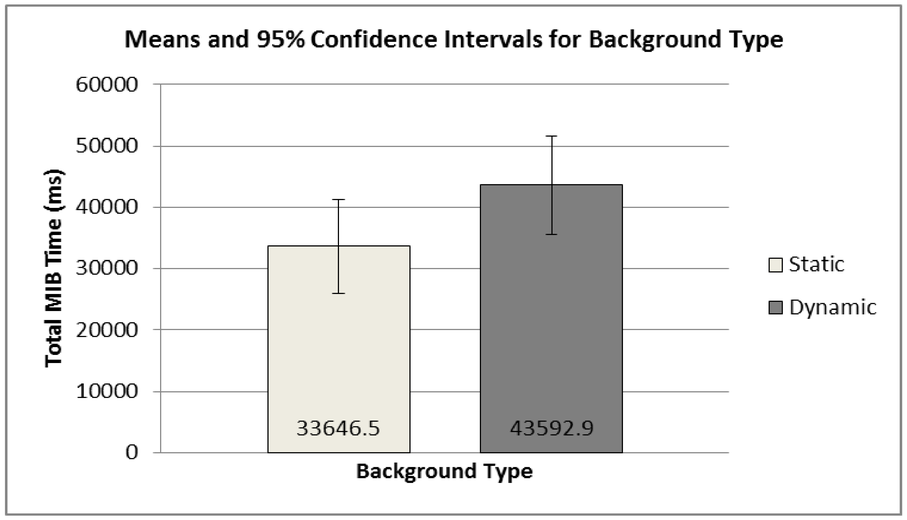
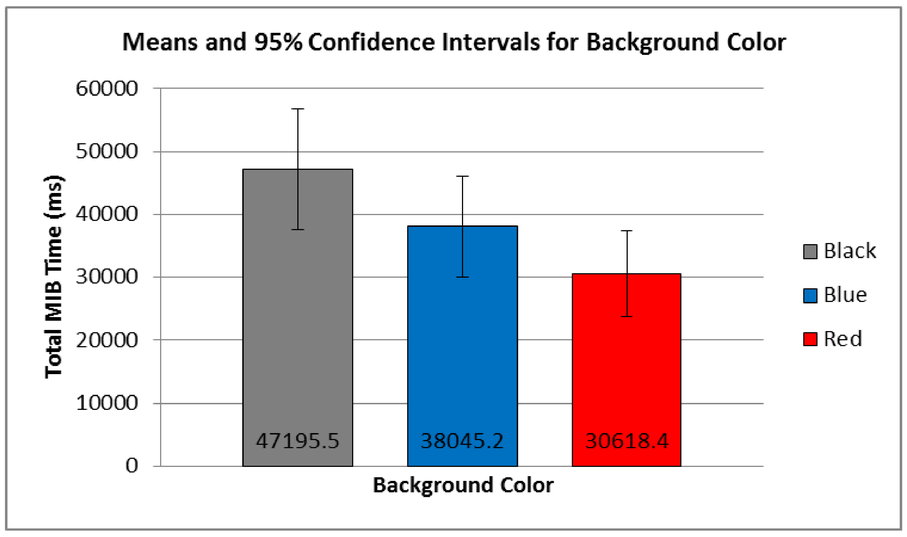
RESULTS



- Participants experienced significantly more motion-induced blindness with dynamic backgrounds than with static backgrounds.
  - $F(1, 29) = 35.025$, $MSe = 127{,}104{,}334.3$, partial $\eta^2 = .547$, $p = .000$, $\alpha = .05$



- Participants experienced significantly more motion-induced blindness with black backgrounds ($p = .000$), than with blue backgrounds ($p = .003$), than with red backgrounds ($p = .000$).
  - $F(2, 58) = 23.129$, $MSe = 178{,}855{,}913.2$, partial $\eta^2 = .444$, $p = .000$, $\alpha = .05$

DISCUSSION

- Significant results support the assumptions and suggestions offered by proponents of an 'attentional theory' for motion-induced blindness and fail to support the assumptions and suggestions offered by proponents of a 'perceptual filling-in theory' for motion-induced blindness.
  - The duration of motion-induced blindness was significantly greater with dynamic backgrounds than with static backgrounds.
  - The duration of motion-induced blindness was also significantly affected by background color, as the duration of motion-induced blindness experienced was an inverse function of the saliency of the green dot in relation to the background color used.
- Nonetheless, motion-induced blindness was elicited both without uniform motion or change and in the absence of any motion or change at all. This reiterates the notion that the term "motion-induced blindness" is increasingly becoming a misnomer.

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