Comparison of Optic Flow Motion Mask in Motion-Induced Blindness to Random and Coherent Motion Masks

Avery Scire, Marlo Frank, Joe LaBarre, and William Stine
Department of Psychology, University of New Hampshire

Background

- **Motion induced blindness (MIB)** is the temporary disappearance of a target object in the presence of moving elements while fixating on a non-target point within the stimulus.
  - Grindley & Townsend (1965) noticed that an object presented to one eye, perceptually disappeared when a moving stimulus was presented to the other eye which they called 'Movement Masking'
  - MIB tends to occur when we are fixating on a specific target.
- **Optic Flow** involves the pattern of retinal motion resulting from the movement of an observer through the environment, the movement of other objects within the field of view, or both (Gibson;1950).
  - As we move through the environment, the point toward which we are moving remains completely stationary while all other points in the environment move radially outward from this point.
  - We measured incoherent and coherent types of motion masks.
    - Coherent motion mask is all of the dots that are in motion are moving in the same direction
    - Incoherent motion mask is when all the dots that are in motion are moving in a randomized pattern.

Methods

- **Experiment 1** used the presence or absence of fixation circles, as well as expanding and contracting optic flow masks. The average mask velocity is +/- 500 mm/s, a speed which corresponds to a slow walk.
- **Experiment 2** used an RB7 design with 7 mask velocities including a 0 mm/s stationary mask, 3 velocities of the expanding mask, and 3 of the contracting mask
- **Experiment 3** used a combination of 3 motion mask categories, including an expanding optic flow mask, 100% coherent motion mask, and a Brownian motion mask

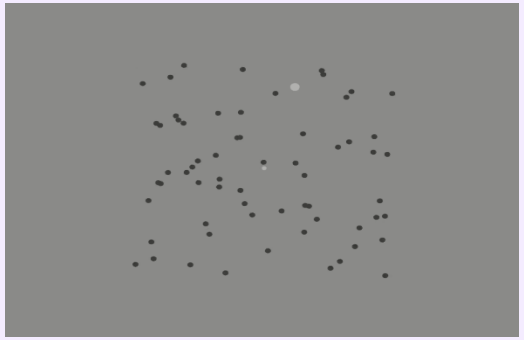

Figure 1. Example of a Brownian motion mask

Results

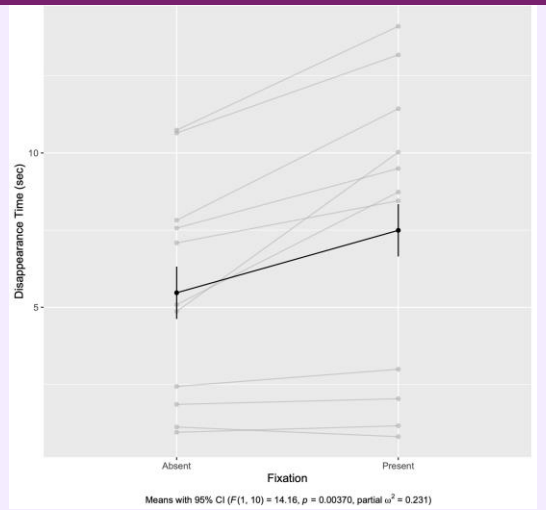

Figure 2. Fixation effects on motion induced blindness

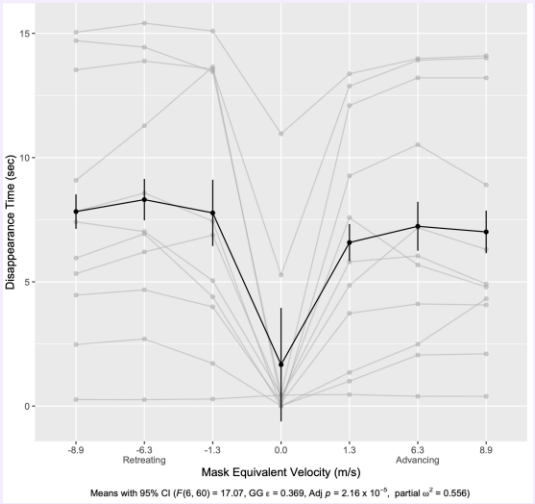

Figure 3. Mask equivalent velocity effects on motion induced blindness

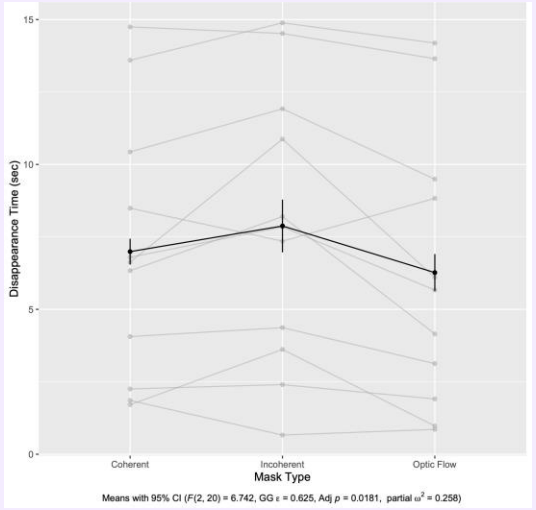

Figure 4. Mask type and effects on motion induced blindness

Conclusions

- When a fixation point was present, the target object disappeared from participants' view for longer than the condition without the fixation point
- Mask equivalent velocity showed a significant increase in disappearance time as opposed to the static motion mask
  - The advancing optic flow mask showed a shorter time of disappearance than the retreating condition
  - There was a statistically significant difference between the static and active masks across both groups
- With the optic flow mask, the target appeared to disappear for less time than the average disappearance time for the coherent and incoherent mask conditions
  - There was no significant difference between mask types, although additional data may affect the results and reveal a stronger trend