Conscious perception of color and size ensemble statistics requires attention

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Background & Objectives

- Previous studies have found that gist perception requires attention (Cohen et al., 2011; Mack & Clarke, 2011).
- However, a recent study (Bronfman et al., 2014) found that a gist-like ensemble statistic, “color diversity”, was immune to dual-task interference.

Methods – Experiment 1

- Color diversity changed from low to high in Critical Trial 1.
- Size diversity changed from low to high in Critical Trial 2.

Methods & Results – Experiment 1

- Across the 3 experiments, >50% of subjects were inattentionally blind to the color and size gist-like statistics.
- Awareness of gist appears to require at least a minimal amount of attention.

Methods – Experiment 2

- To test whether this gist-like statistic can be perceived without attention, we combined a variant of Mack & Rock’s (1998) inattentional blindness paradigm with Bronfman et al.’s (2014), and asked:
  1) Can inattentional blindness occur for the color diversity gist-statistic (and other statistics)?
  2) Are these gist-like percepts really immune to dual-task interference?

Methods & Results – Experiment 2

- Dual-task interference was observed with the color and size tasks.
- An attentional cost is associated with color (& size) phenomenality.

Methods & Results – Experiment 3

- Color diversity changed randomly on the 7 lead-up trials, and was either high or low on Critical Trial 1.
- Mean size was manipulated instead of size diversity (Haberman & Whitney, 2012).

Methods

- Identical to Experiment 1 except:
  - Color diversity changed from low to high in Critical Trial 1.
  - Mean size was manipulated instead of size diversity (Haberman & Whitney, 2012).

Conclusions

1) Across the 3 experiments, >50% of subjects were inattentionally blind to the color and size gist-like statistics. Thus, awareness of gist appears to require at least a minimal amount of attention.
2) Dual-task interference was observed with the color and size tasks. Therefore, an attentional cost is associated with color (and size) phenomenality.

Attention is necessary for conscious perception, even for basic ensemble percepts such as color and size.

References