Inattentional Blindness to Color Ensemble Statistics

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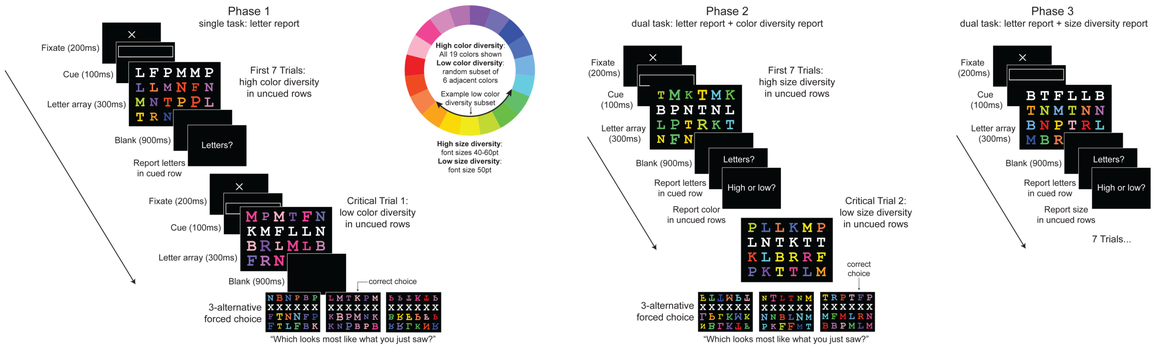
Background & Objectives

- 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.
- 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:

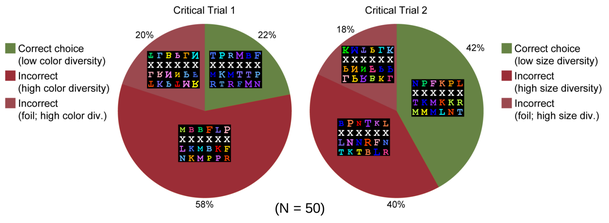
  1) Can inattentional blindness occur for the color diversity gist-statistic (and other statistics)?

  2) Are these gist-like percepts really immune to dual-task interference?

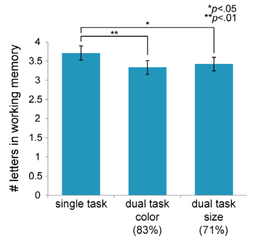
Methods – Experiment 1



Results – Experiment 1



(N = 50)

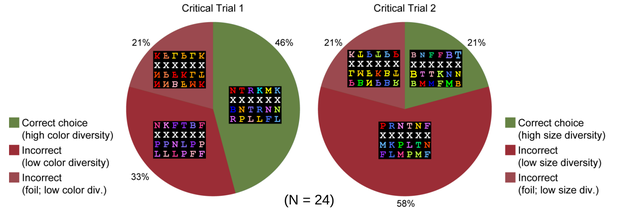


Methods & Results – Experiment 2

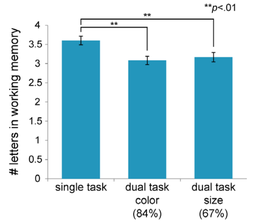
Methods

Identical to Experiment 1 except…

- color diversity changed from low to high in Critical Trial 1
- size diversity changed from low to high in Critical Trial 2.



(N = 24)



Methods & Results – Experiment 3

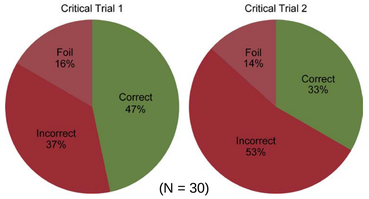
Methods

Identical to Experiments 1 & 2 except…

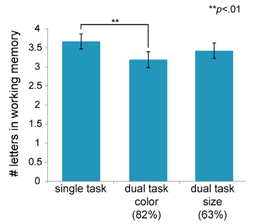
- color diversity changed randomly on the 7 lead-up trials, and was either high or low on Critical Trial 1
- mean size was manipulated instead of size diversity (Haberman & Whitney, 2012)
- mean size changed randomly on all lead-up trials, and was either high or low on Critical Trial 2.

Low size: 40-50pt

High size: 50-60pt



(N = 30)

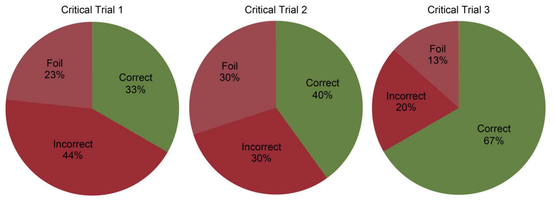


Methods & Results – Experiment 4

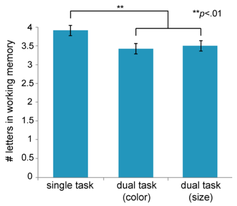
Methods

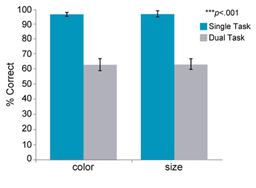
Identical to Experiment 3 except…

- subjects trained to discriminate high vs. low color diversity on the first 7 trials (single task color)
- subject then trained to discriminate high vs. low mean size on the next 7 trials (single task size)
- Exp 3 was then repeated, but at the very end, on a 3rd critical trial, we asked about color again



(N = 30)





Conclusions

1) Across the 4 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 (& size) phenomenality.

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

References

Bronfman, Z., Brezis, N., Jacobson, H. & Usher, M. (2014). We see more than we can report: “Cost free” color phenomenality outside focal attention. *Psychological Science, 25,* 1394-1403.

Cohen, M., Alvarez, G., & Nakayama, K. (2011). Natural-scene perception requires attention. *Psychological Science, 22,* 1165-1172.

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