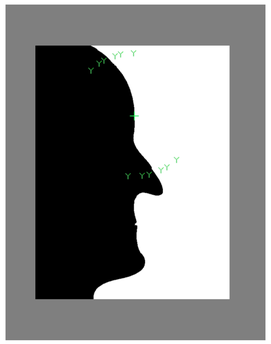
26.325

Attention is allocated to figural cues (not figures) under conditions of uncertainty

Andrew J. Mojica, Elizabeth Salvagio & Mary A. Peterson
University of Arizona

Peterson Lab

Question: Is attention automatically drawn to figures?



Nelson and Palmer (2007)

Figural cue: Familiar shape (Peterson & Gibson, 1991)

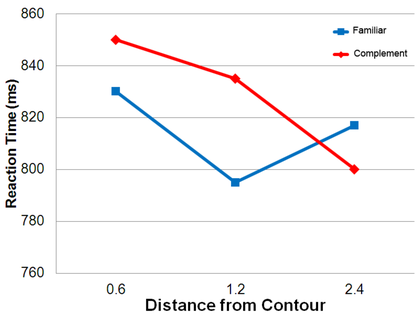
Size: LARGE! (~ 18^0 W x 20^0 H)

Target Discrimination/Detection

80ms Target Exposure

Display Target SOA: 0, 150, 250, 500ms

12 Target Locations



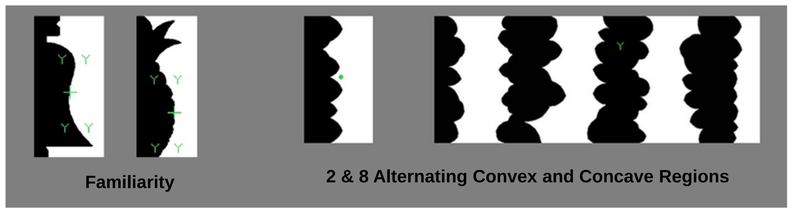
N&P Conclusion

Figures or figural cues automatically draw attention

If figures: predict upright > inverted
(Peterson & Gibson, 1994)

But Upright = Inverted

Background



*Target color & size changed for visibility
All targets were medium gray and 0.2^0 H in experiments

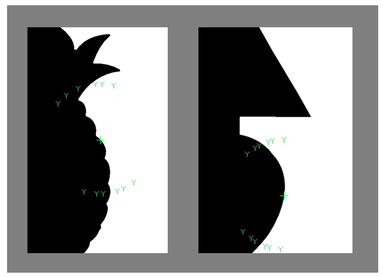
Difference: Smaller displays & Low spatial uncertainty

Results: No advantage for targets on figure/figural cue

With target certainty, subjects strategically attend to area that includes figure and ground?

Experiment 1

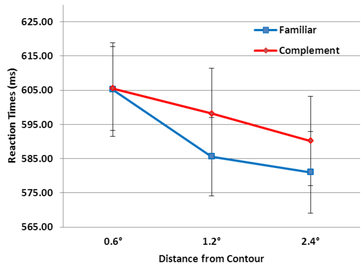
Familiarity with High Uncertainty



Display size, Target Location & SOAs: similar to N&P

Orientation: Upright & Inverted

Salvagio, Mojica, Kimchi, & Peterson VSS 2011



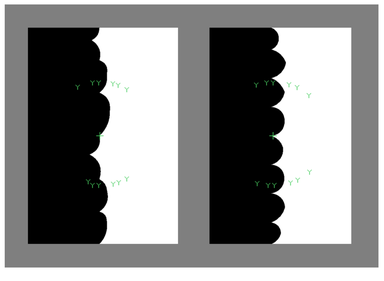
Spatial & temporal uncertainty, advantage for familiar side

Upright = Inverted

Attention to figure or figural cue?

Experiment 2

Separate figural status from figural cue



2 Responses
Primary: Target Discrimination
Secondary: Figure/Ground
Expect ~ 60% convexity = figure

Large displays & target uncertainty

What draws attention: Figure or Figural Cue?

If perceived figure:
RTs faster for targets on regions perceived as figures vs. grounds (regardless of convex or concave)

If convex regions perceived as figures
RTs faster for targets on convex regions perceived as figures vs. concave regions perceived as grounds

If the figural cue of convexity:
RTs faster for targets on convex regions vs. concave regions (regardless of whether convex = figure)

Experiment 2 Results

Attention to Perceived Figure: NO

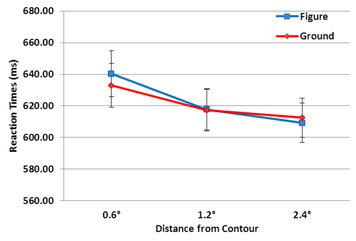
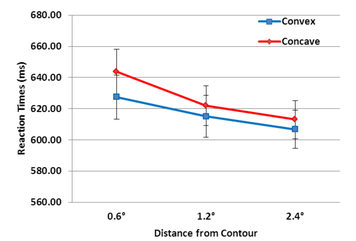


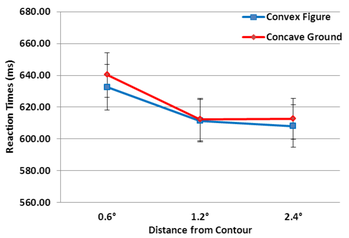
Figure vs. Ground, $p = .784$

Attention to Figural Cue: YES



Convex < Concave, $p = .014$

Attention to Convexity = Figure: NO



Convex Figure vs. Concave Ground, $p = .733$

Convexity = Figure 61%

Advantage for targets on the figural cue only

Conclusions

Attention is **NOT** automatically allocated toward the figure.

Attention **is** allocated toward the figural cue
Only with target uncertainty and large displays
Perhaps driven by statistical regularity
Small effect; can be overcome by strategic attention with target certainty

Figures **are** important. They are the objects in the visual field, but they don't automatically draw attention.

References

Peterson & Gibson (1991). Bulletin of Psychonomic Society, 29, 199-202

Nelson & Palmer (2007). Perception & Psychophysics, 69, 382-392.

Mojica, Salvagio, Kimchi & Peterson (VSS 2009). Journal of Vision, 8, 1007.

Peterson, & Gibson (1994). Psychological Science, 5, 253-259

Support: MAP NSF BCS 0425650 & 0960529, ES Cognitive Science Program, University of Arizona

Contact: Andrew Mojica ajmojica@email.arizona.edu