

## What is False Pop Out (FPO)?

Pop out of a homogenous distractor(s) as evidenced by response distributions.

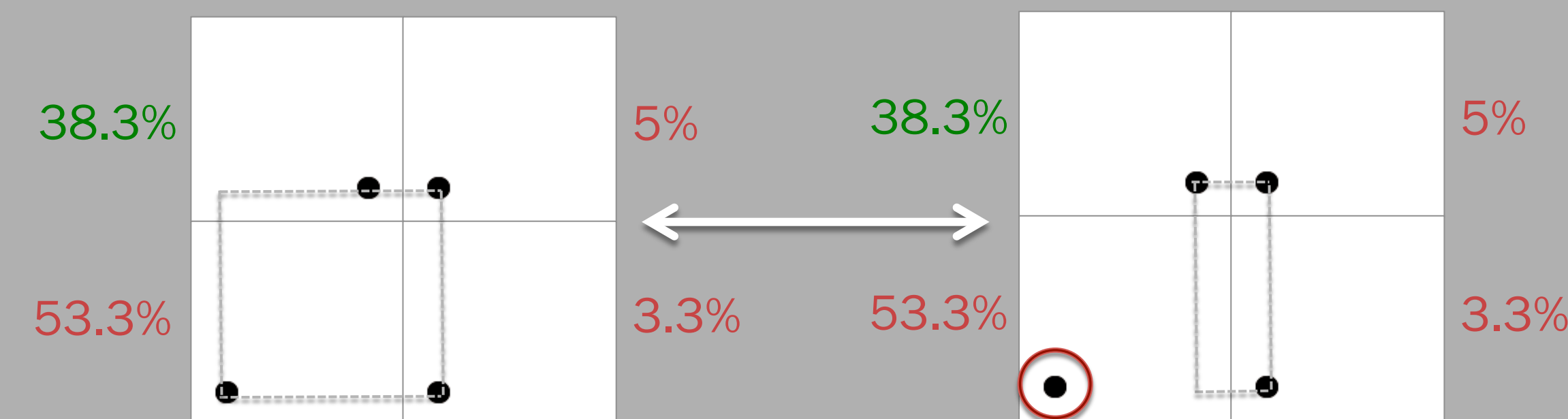


Pop out is traditionally attributed to basic feature differences (A), but emergent feature differences (especially symmetry) can cause distractors to pop out (B).

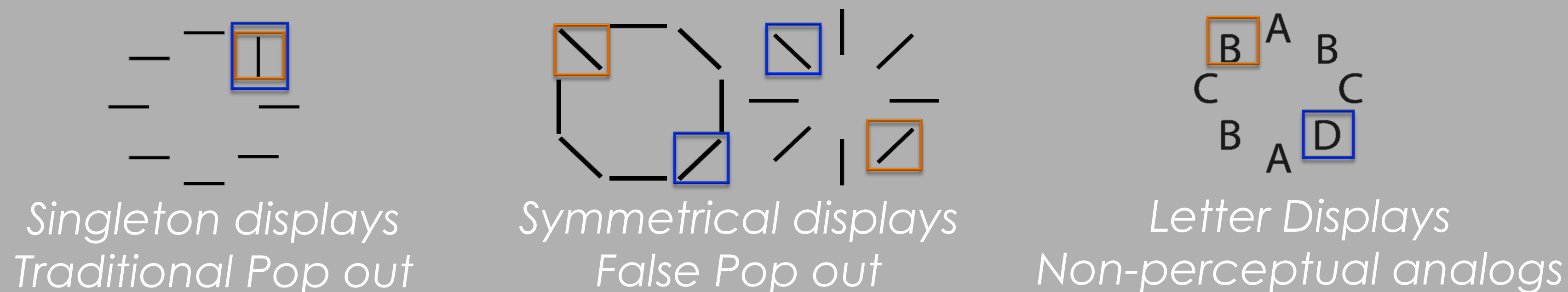
## FPO with 4 items



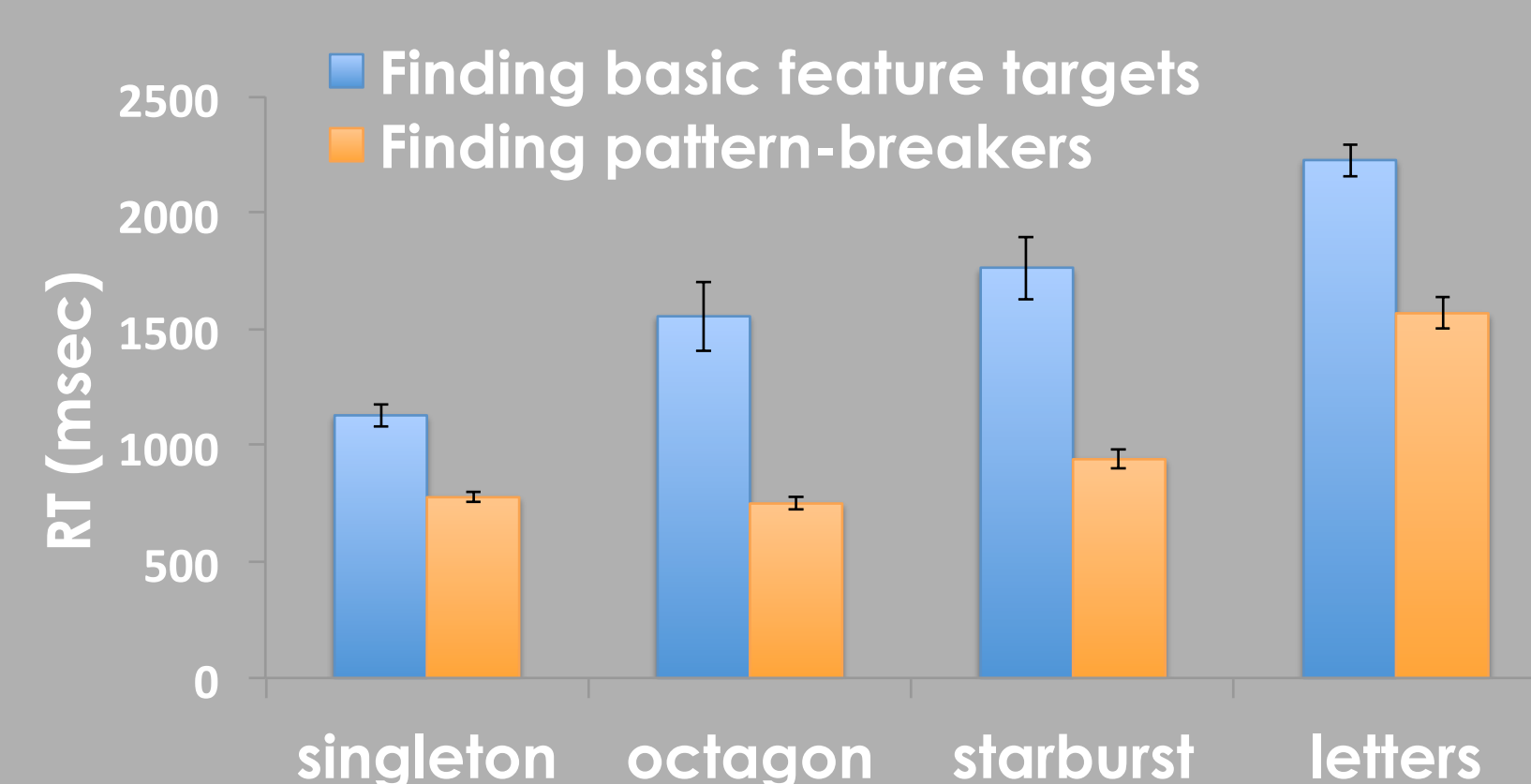
Competing symmetrical percepts of a square and a rectangle (below) determined which dot popped out.



## FPO with 8 items

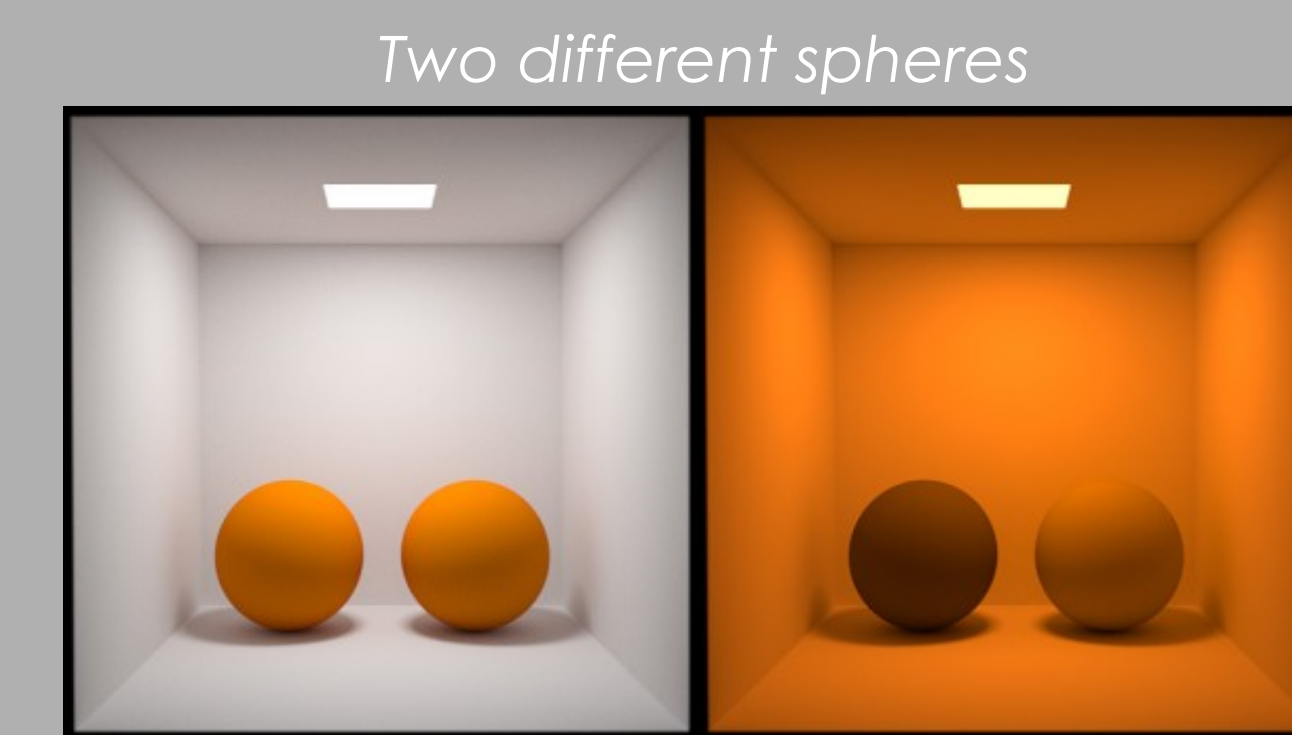


Two tasks, same displays: Find the pattern-breaking (orange box), or different (blue box) targets. The pattern-breaker was the most common item in the display, but was always found faster than the unique (basic feature) target.

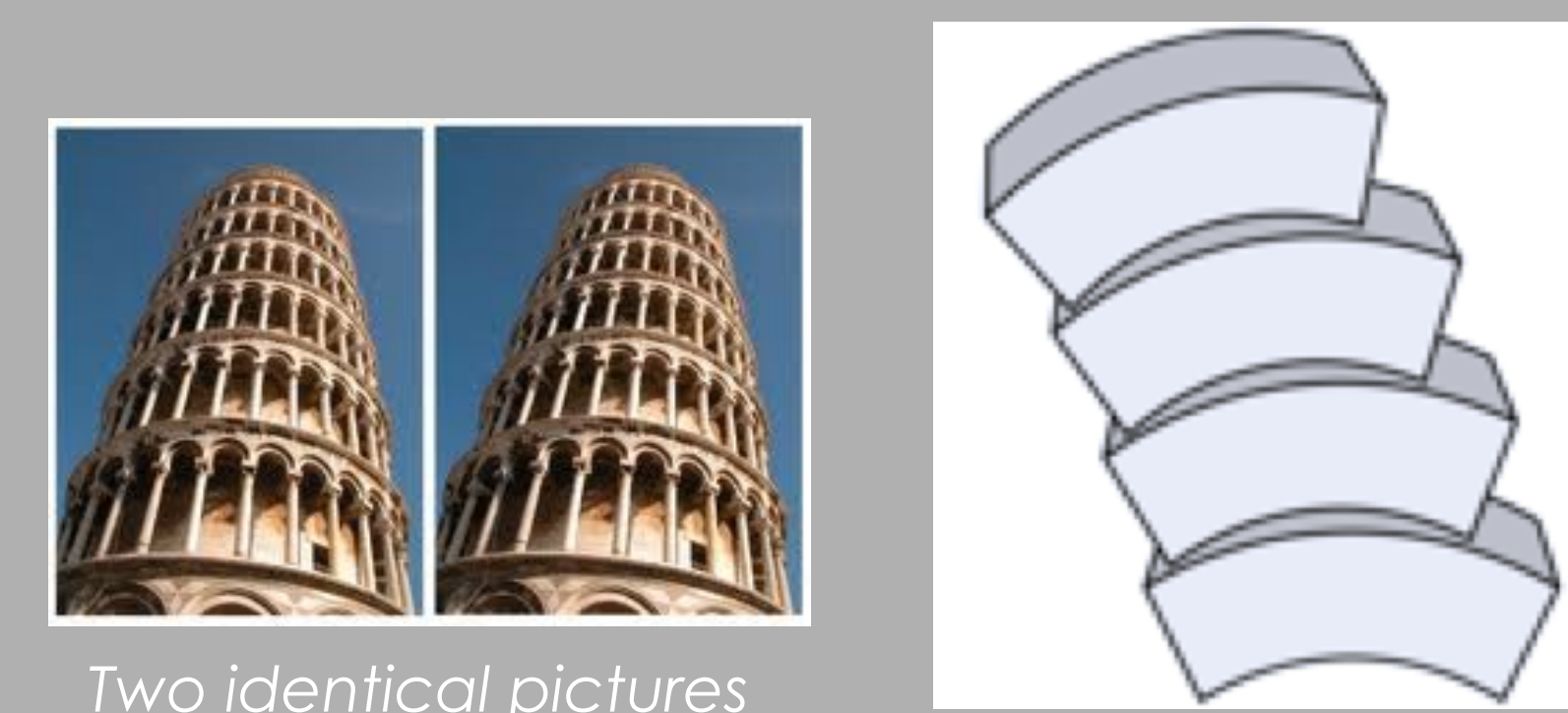


## Pure FPO with 3 items using anti-metamers

Metamers: Physically different stimuli that are perceived as identical.

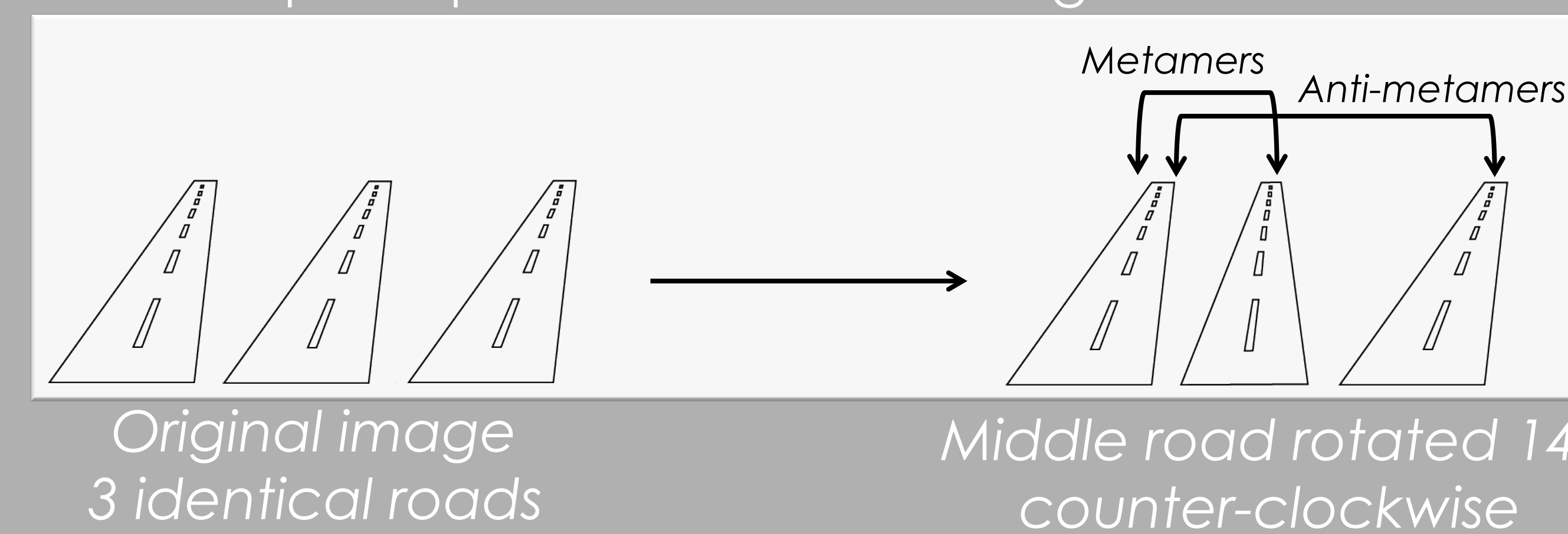


Anti-metamers: Physically identical stimuli that are perceived as different.

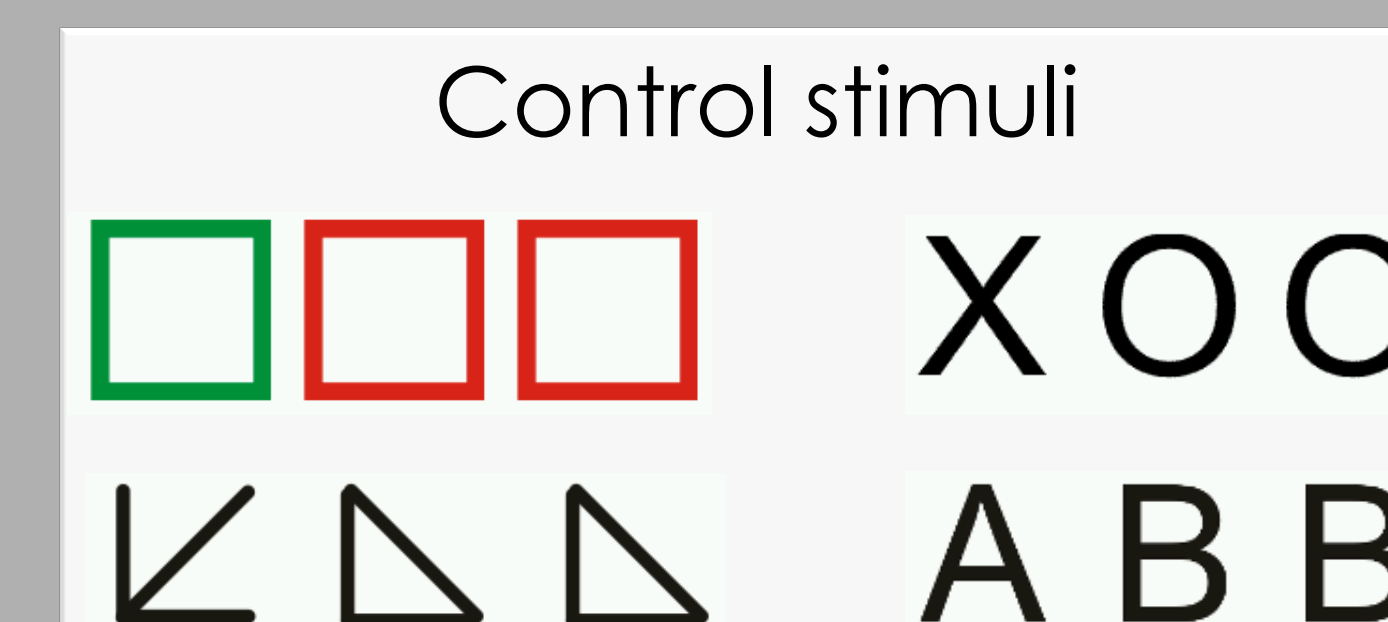
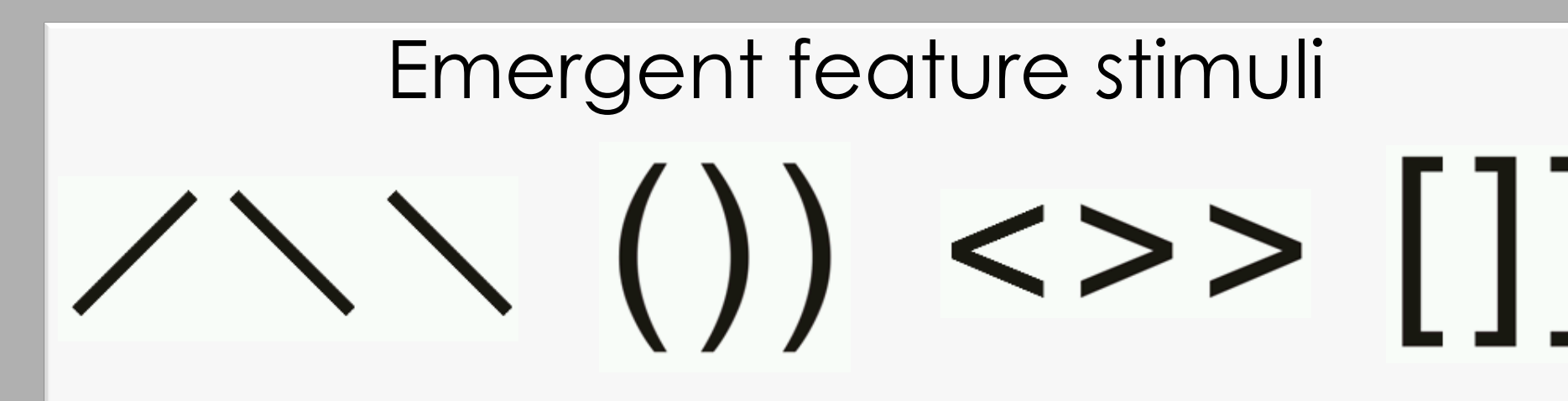
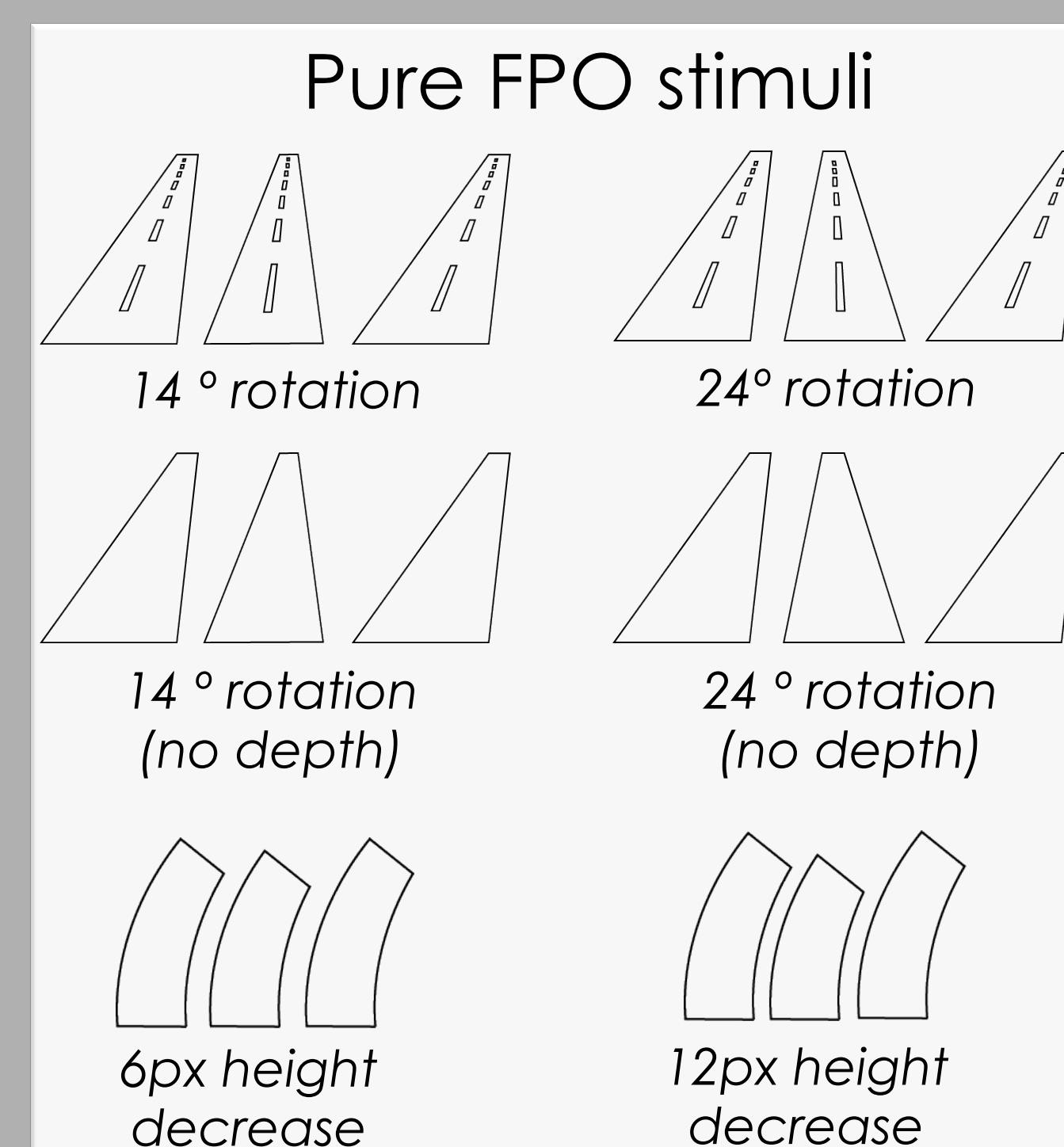


## Pure FPO = 2 anti-metamers + 1 metamer

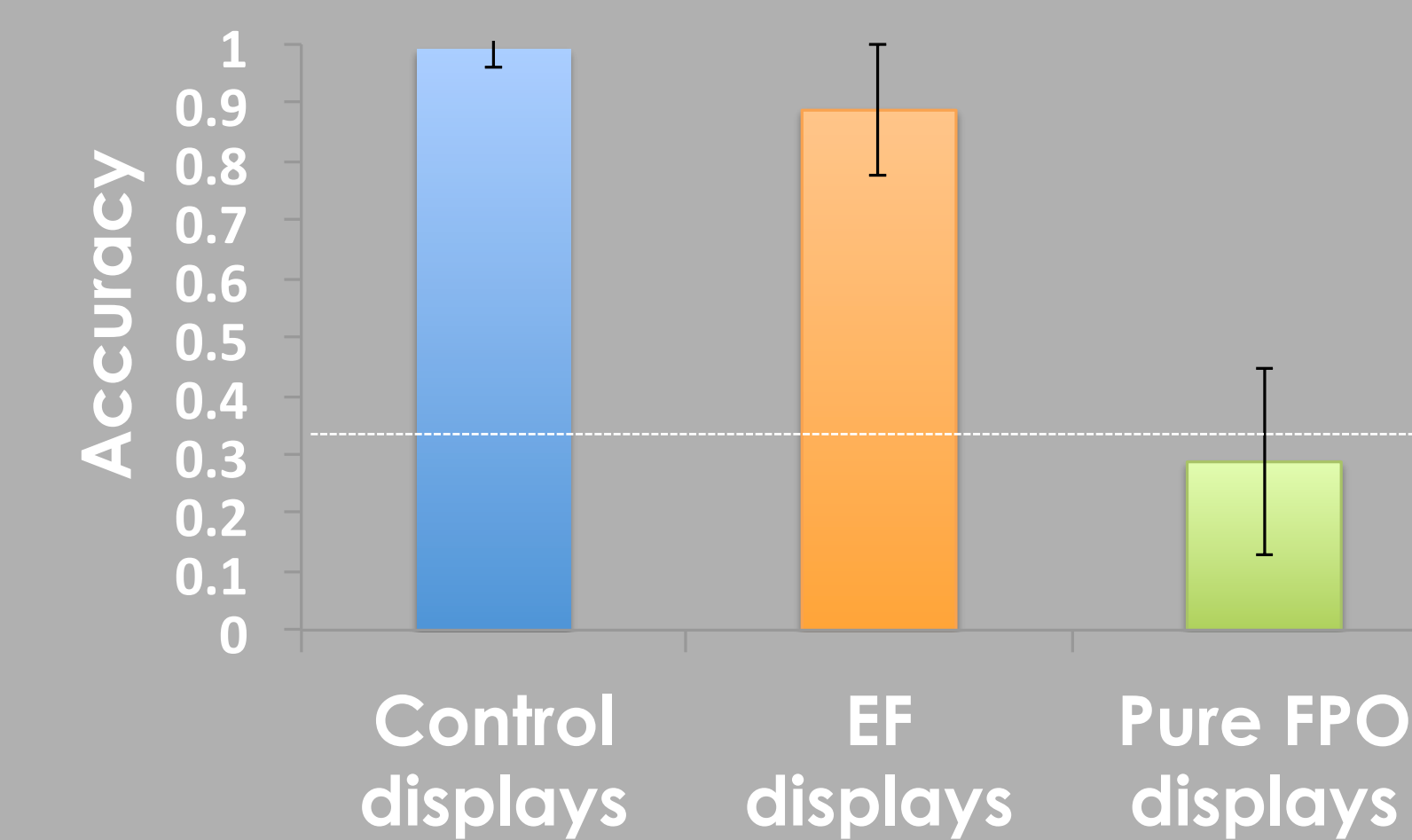
5 of 7 participants chose a 14° rotation of the center road as a metamer to the leftmost road. This was also perceived to strengthen perceptual isolation of the rightmost road.



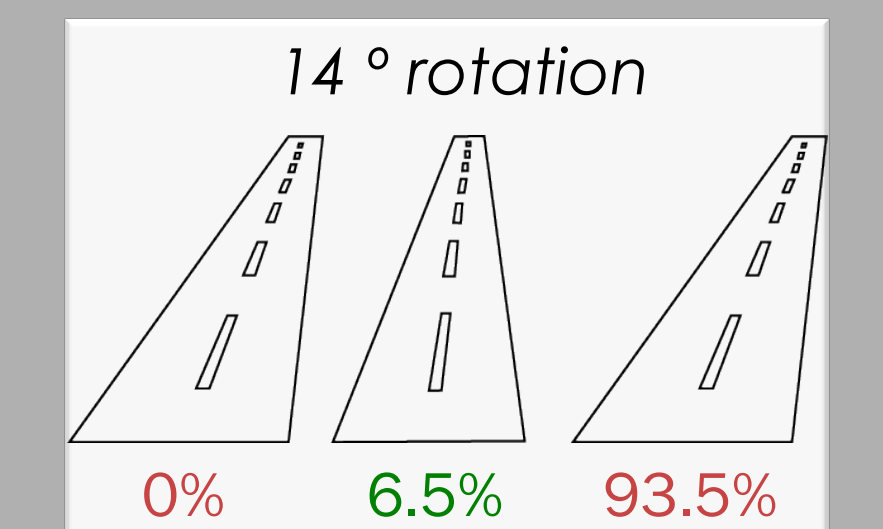
## Stimuli



## Results: Experiment 1



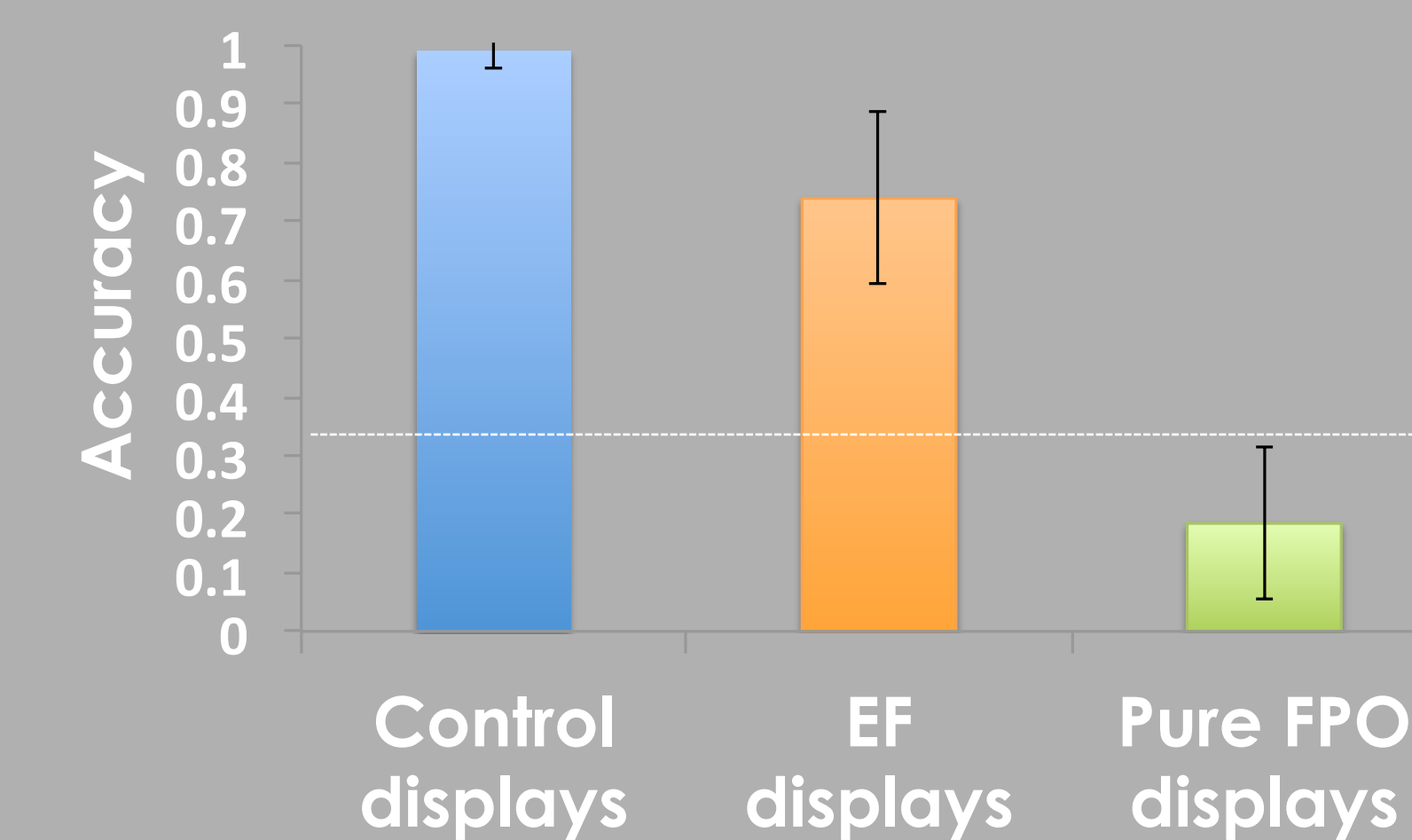
8 subjects: 1.5s presentation time



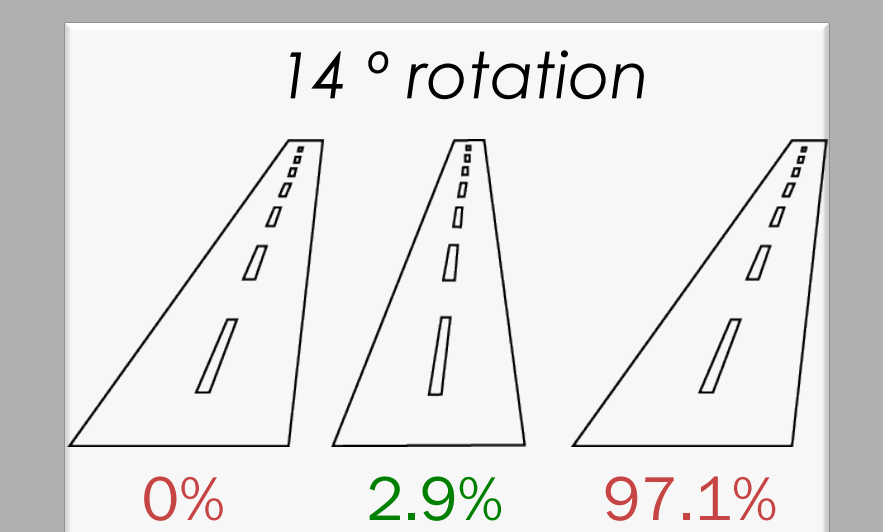
Although physically identical, participants consistently chose the perceptually isolated item.

## Results: Experiment 2

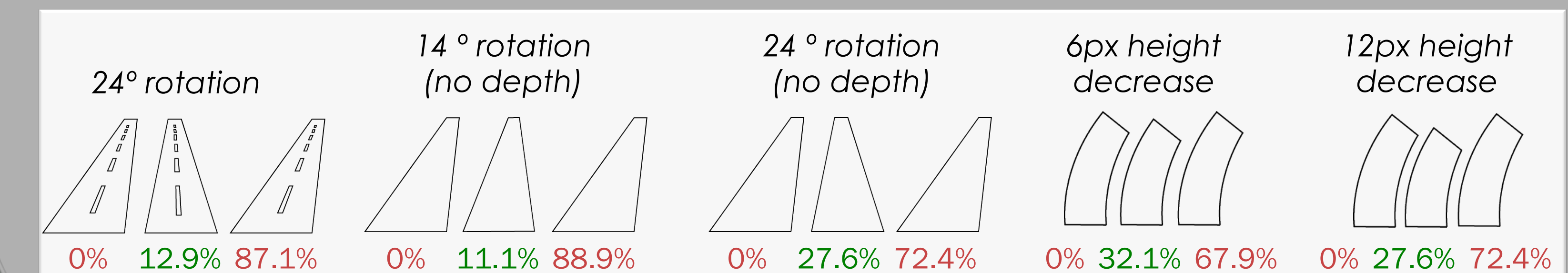
Purpose: Were subjects reporting their actual percepts, or did they have time to self-correct?



9 subjects: 1s presentation time



Control comparison  
**B B A**  
.7% 1.4% 97.9%



Other Pure displays (above) are not "pure", but FPO is strong

## Conclusions

Pop out, although traditionally attributed to the salience of basic feature differences, is more likely the result of inter-item grouping and symmetry-breaking, as claimed by the Theory of Basic Gestalts (Pomerantz & Portillo, 2011). As demonstrated with Pure FPO, basic feature differences do not determine salience in vision.

## References

- Pomerantz, J. R., & Portillo, M. C. (2011). Grouping and Emergent Features in Vision: Toward a Theory of Basic Gestalts. *Journal of Experimental Psychology: Human Perception and Performance*, 37(5), 1331-1349.
- Metamer photo taken from <http://www.eclat-digital.com/metamerism/>
- 3-Road stimulus ©Akiyoshi Kitaoka (2010)
- Special thanks to Amanda Hahn for her EPrime skills