False Pop Out and “Anti-Metamers”
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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
4.7%
1.6%
25%
68.8%
Competing symmetrical percepts of a square and a rectangle (below) determined which dot popped out.

FPO with 8 items
29%
68.8%
95.2%

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.

Pure FPO = 2 anti-metamers + 1 metamer
5 of 7 participants chose a 14º rotation of the center road as a metamer to the leftmost road. This was also perceived to strengthen perceptual isolation of the rightmost road.

Original image
3 identical roads
Middle road rotated 14º counter-clockwise

Emergent feature stimuli

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
- Road stimulus © Akiyoshi Kitaoka (2010)
- Special thanks to Amanda Hahn for her EPrime skills