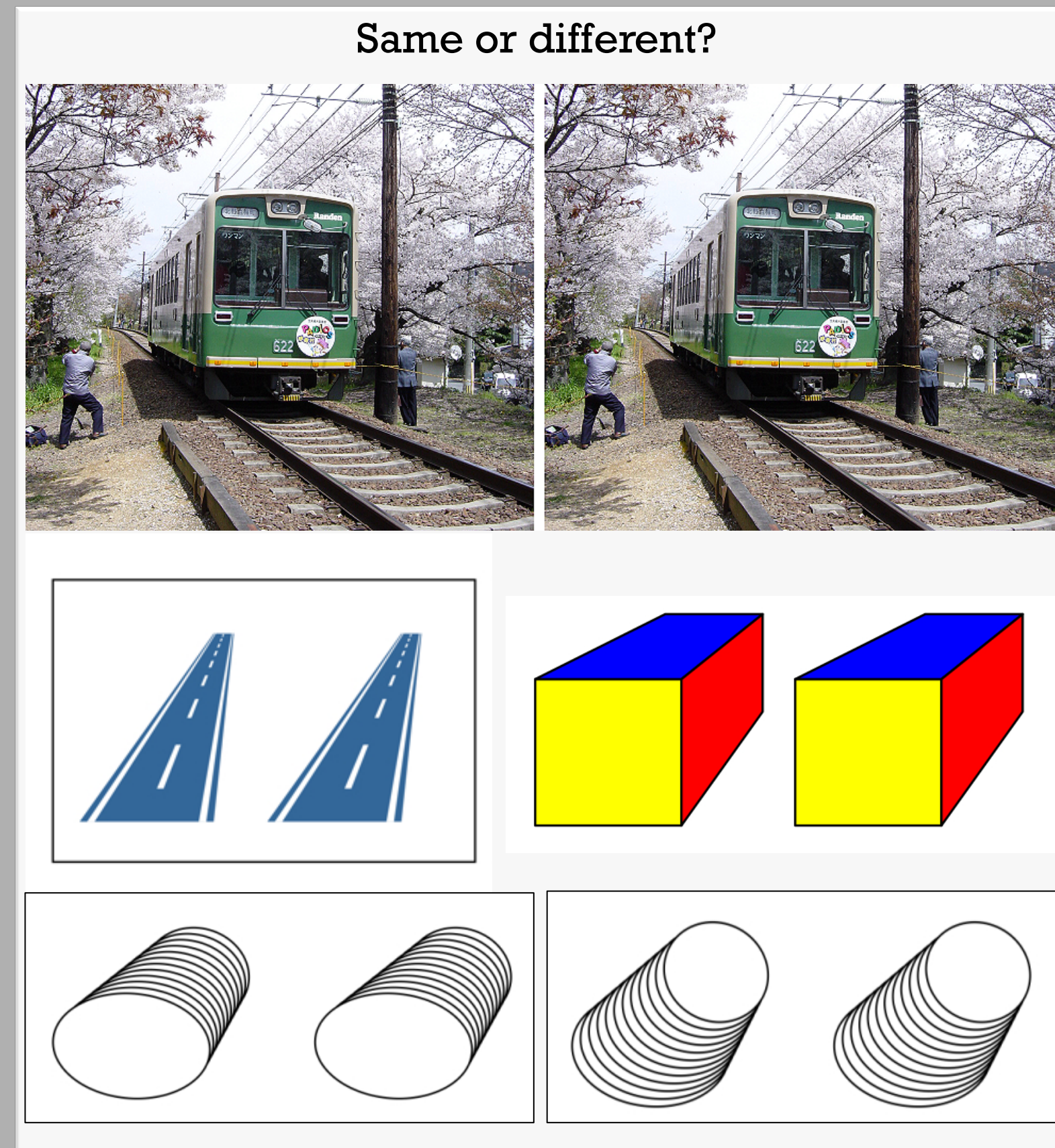
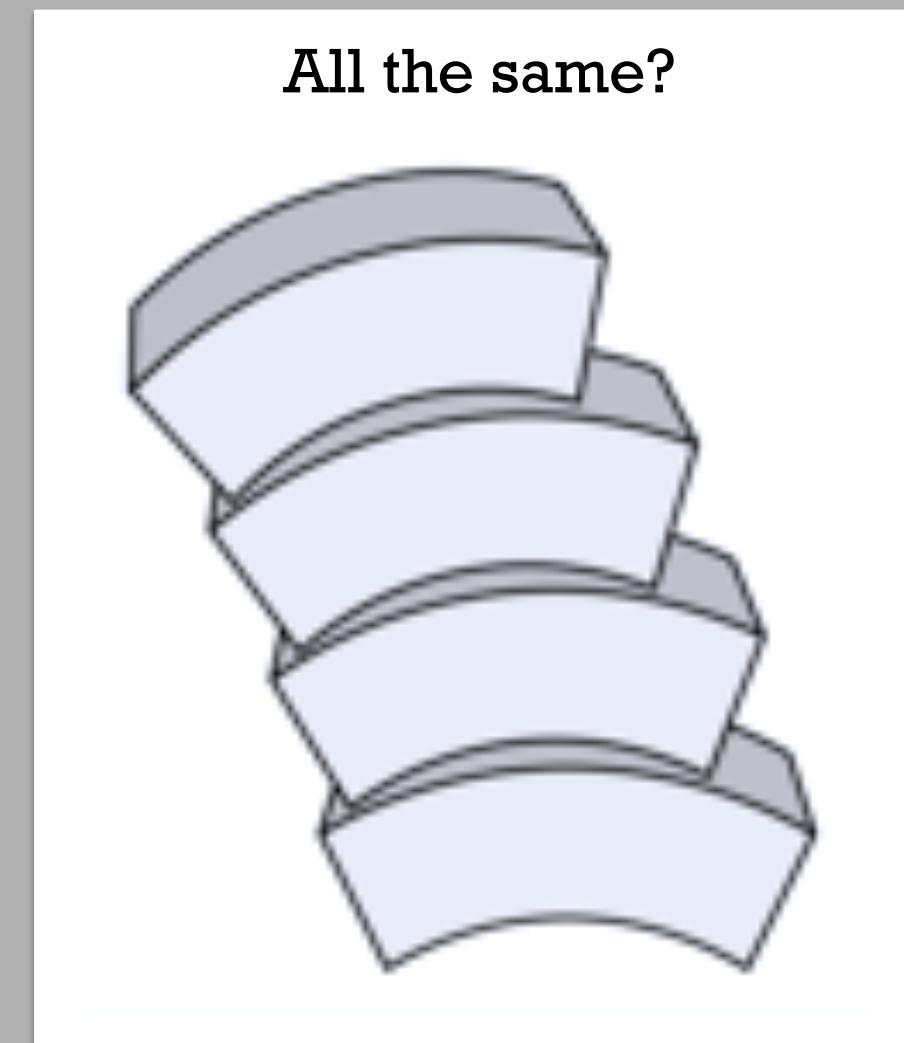


What makes two items look different?

Grouping can make identical items look different, and it can cause False Pop Out (FPO).



False Pop Out (FPO):
One or more distractors in a singleton display poses as a target.

FPO with 4 items

A. **B.**

Task: Find the quadrant that is different in each display.

Subjects used the amodal percept of a square to help find the distractor in non-FPO displays.

DISPLAY A (no FPO): 1.6% 95.2%

When the square wasn't clearly disrupted... 4.7% 25%

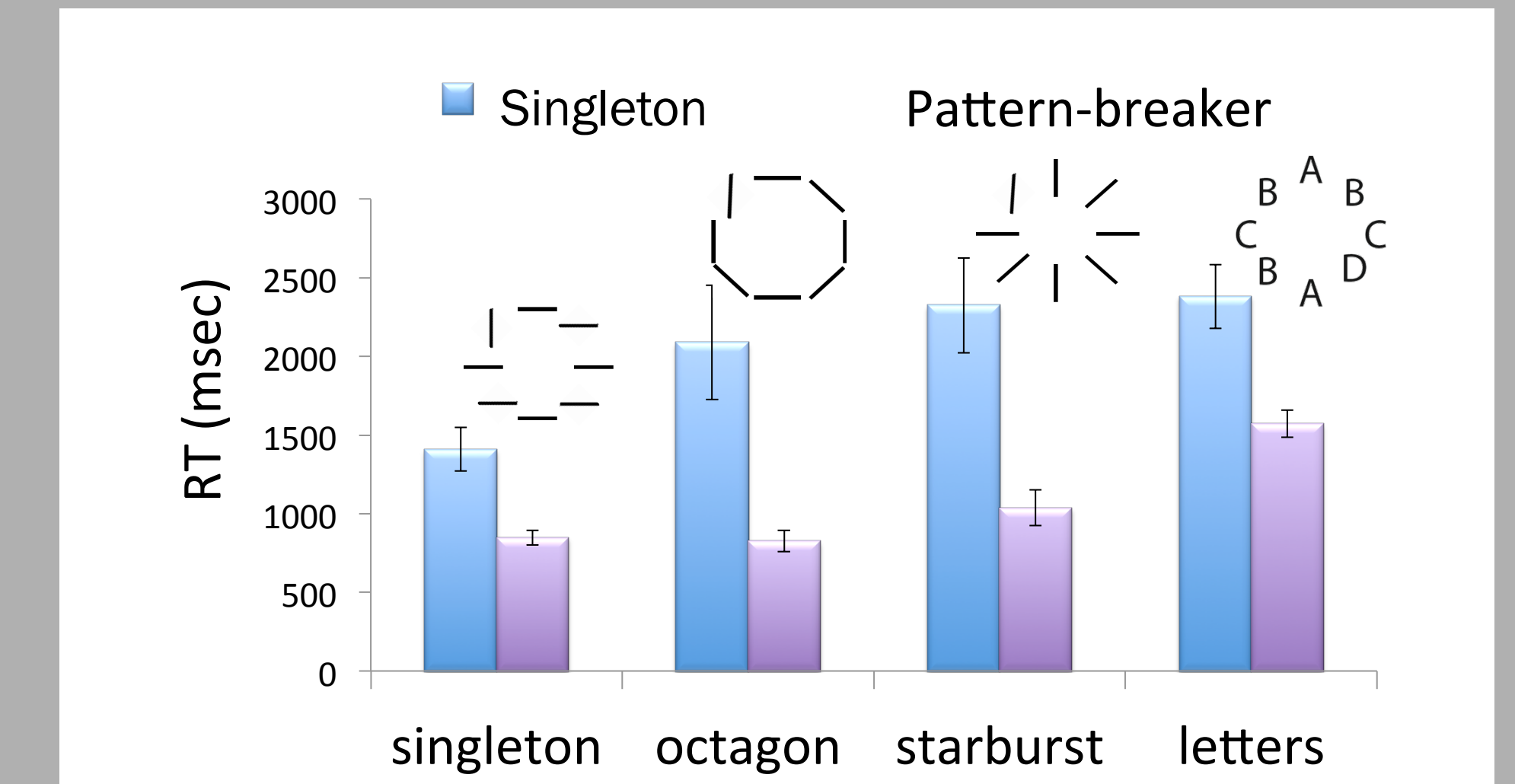
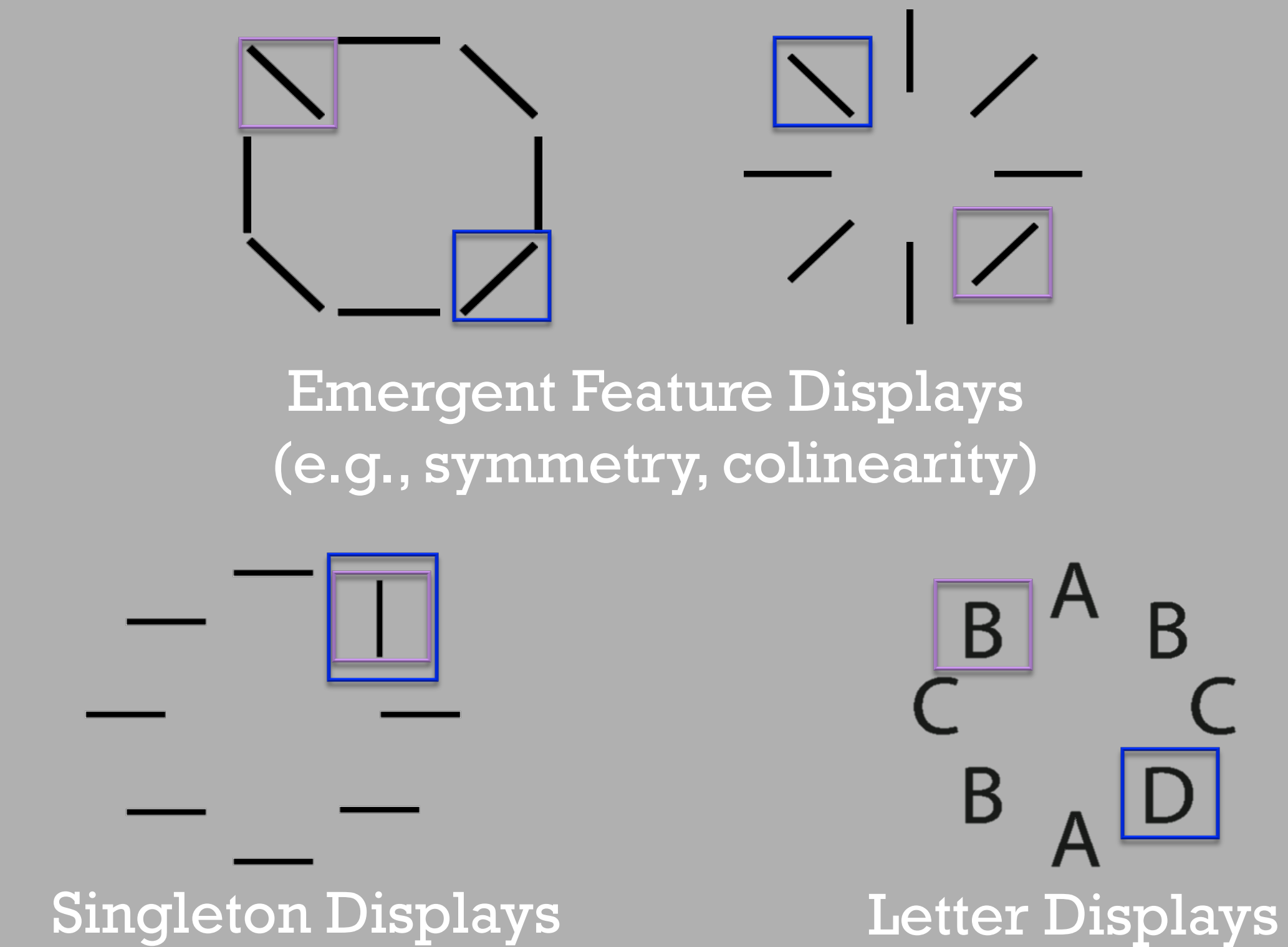
...the rectangle was. 1.6% 68.8%

green = correct response %; red = incorrect response %

FPO with 4 heterogeneous item pairs

Two tasks using the same displays:

- Find the Pattern-breaking target (purple)
- Find the singleton target (blue)



Subjects were faster at finding the Pattern-breaking target despite its being one of the most common items. If Pop Out is based only on basic feature differences, common items should not pop out.

FPO with 3 items: Initial observations

11.11 88.19 0.69	92 6 2	7.64 89.58 2.78	84.56 12.08 3.36
13.99 83.92 2.10	85.14 10.81 4.05	5.59 82.52 11.89	82.76 13.79 3.45
16.42 78.36 5.22	84.72 9.03 6.25	12.50 79.41 8.09	85.23 4.70 10.07
16.78 73.43 9.79	90.48 7.48 2.04	12.95 82.01 5.04	84.56 10.07 5.37
16.54 78.20 5.26	97.32 1.34 1.34	5.52 82.07 12.41	86.39 6.12 7.48

2 analogous arrangements showed the same pattern of FPO (FPO boxed in red).

Differing patterns in remaining arrangements suggests multiple possibilities for grouping.

Control items showed near perfect performance.

0 0 100	98.65 0.68 0.68	

A. **B.** **C.**

80 20 0	14.18 71.64 14.18	11.19 79.85 8.96
81.56 17.73 0.71	15.70 74.38 9.92	7.80 83.69 8.51
82.88 12.33 4.79	10.94 82.81 6.25	17.02 73.36 9.22

15 of 17 sets of analogous dot arrangements showed the same patterns of performance (A, above). Only 2 arrangements did not share performance patterns (B and C, above).

84.56 12.08 3.36	89.04 10.27 0.68
3.45 2.76 93.79	1.32 3.31 95.36

Some arrangements seemed as though they should produce the same patterns of response, but do not, suggesting different combinations of emergent features occurring between seemingly similar displays.

Summary

More analysis of the 3-item FPO displays is necessary, but preliminary observations reveal certain analogous arrangements as receiving the same response patterns, suggesting the presence of a common emergent feature or combination of features, the perception of which precludes basic feature pop out.

False Pop Out in multiple types of displays is converging evidence toward the Theory of Basic Gestalts as providing a more comprehensive explanation of Pop Out.

References

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- Images in intro: Akiyoshi Kitaoka (taken from: <http://www.psy.ritsumeai.ac.jp/~akitaoka/shatosakushi-e.html>)