Dissociating goal-directed and stimulus-driven determinants in attentional capture

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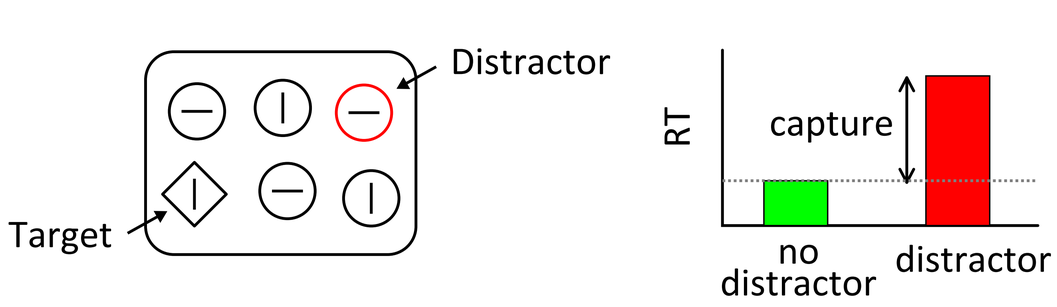
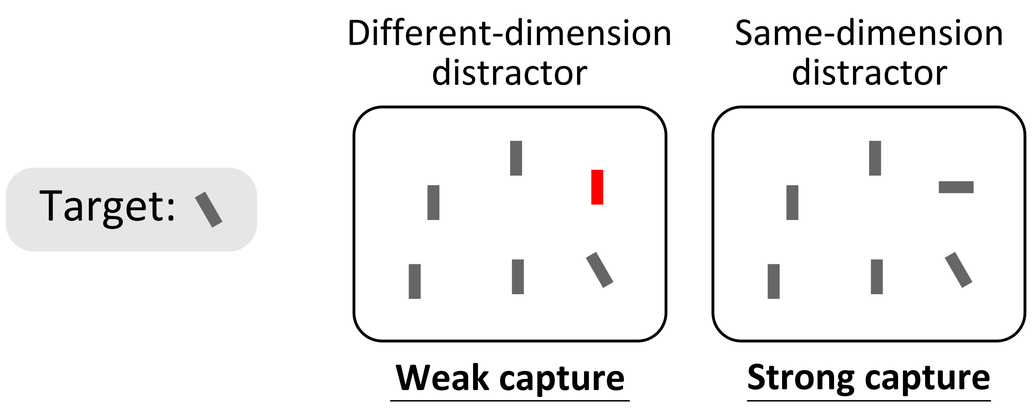
Background

We encounter "attentional capture" when a salient event attracts our attentional focus



In most cases, dimensionality of the distractor matters



Why is different-dimension singleton weaker?

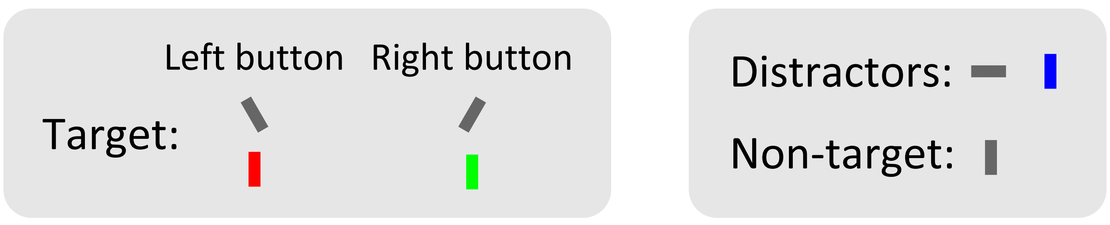
Two possible explanations:

1. Because the distractor does not match the observer's "attentional set" (e.g., Folk, Remington, & Johnston, 1992)

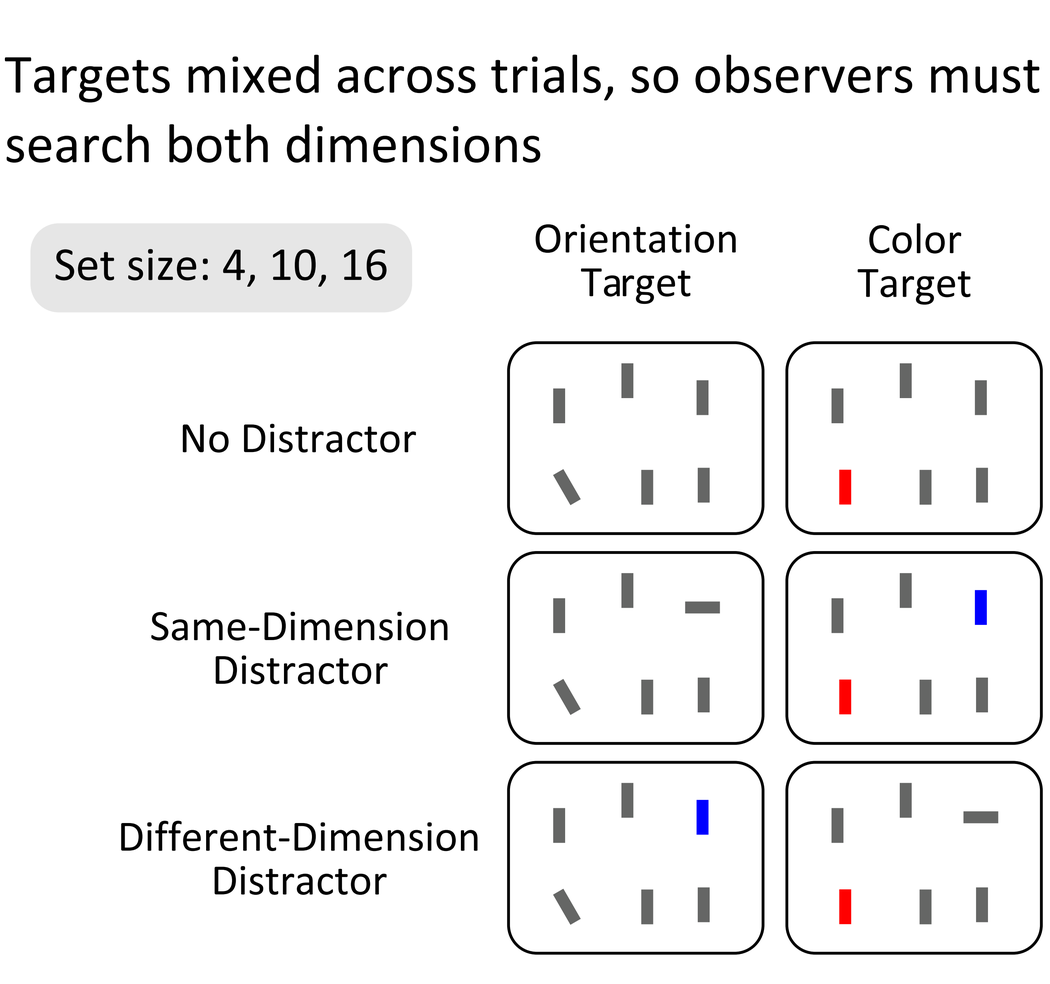
2. Because the distractor and the target are represented in different feature maps (Chan & Hayward, 2009)

Current study

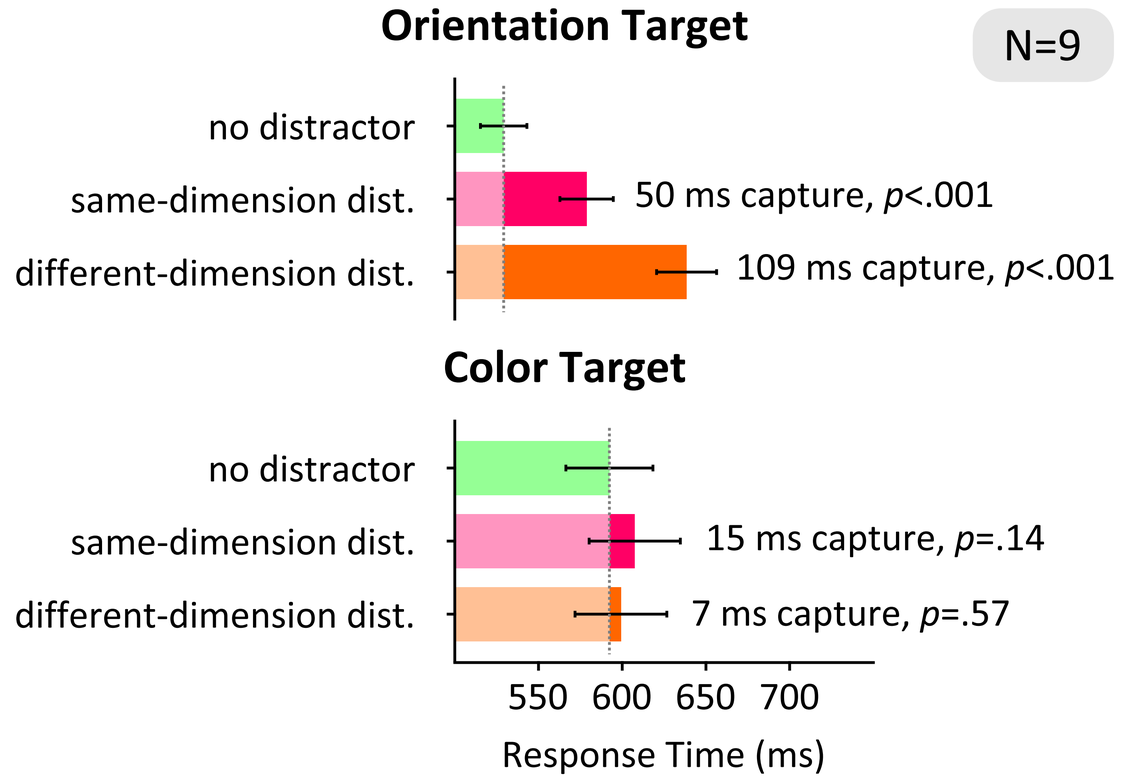
Create a situation where a different-dimension distractor also matches the attentional set



Targets mixed across trials, so observers must search both dimensions



Results



For orientation targets, both same- and different-dimension distractors strongly captured attention

For color targets, distractors did not capture attention

Conclusions

Suppose color is the more salient dimension...

→ Current data suggest relative saliency of the target as compared to the distractor is crucial for producing capture

→ Consistent with Theeuwes' (1991) suggestion that visual saliency determines search order

Why across-dimension attentional capture has been very weak (<40 ms) in other studies?

→ In other studies, different-dimension distractors generally did not match current attentional set

→ Although these distractors may be salient enough to produce capture, capture size was small

→ We reason that when attentional set is matched, it may be more difficult to disengage attention from the distractor, resulting in stronger capture

In other words, we suggest that while a high distractor saliency enables capture, capture size is influenced by its match to the current attentional set

This proposal reconciles the stimulus-driven view and the contingent-capture view in the attentional capture literature

Acknowledgement

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