SiZe poOLiNG

The effect of crowding on perceived size

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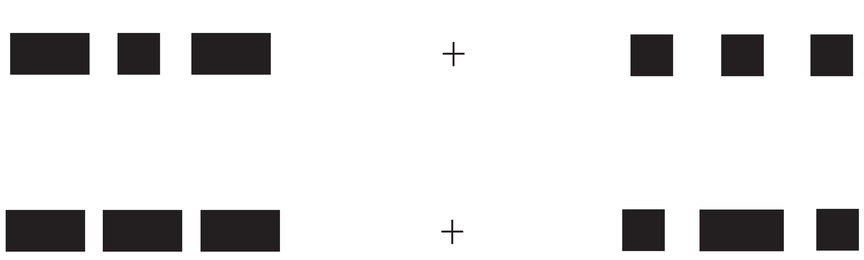
Introduction

The perception of a peripherally viewed object is impaired when the object is surrounded by similar objects. This is crowding. Crowding has been shown to impair identification of a target's shape, orientation, and size (van den Berg et al., 2007). Here we use visual matching of perceived size to look for pooling.

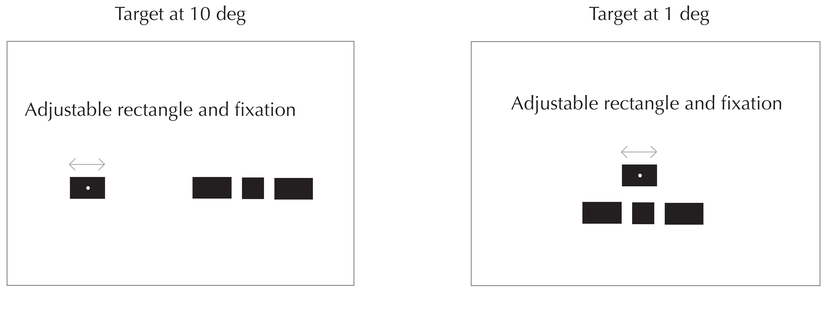
Demo

Fixate the plus and estimate the width of the target. It looks wider when the flankers are wider. This is pooling.



Methods

Observers fixate a point in an adjustable rectangle. While maintaining fixation, the observer adjusts the rectangle width (using left and right arrow keys) to match the perceived width of a target rectangle. The target rectangle is at 10 or 1 deg eccentricity. In flanked conditions, the target is flanked by one rectangle on each side. We tested various target and flanker widths: 0.75, 1, and 1.25 deg. The height of all rectangles was always 0.75 deg.



Results

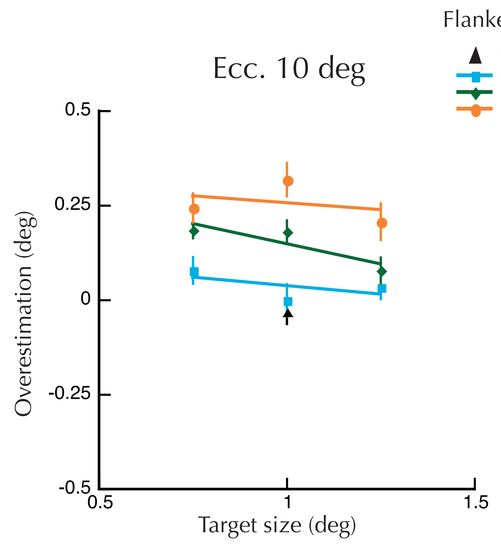


Figure 1. At 10 deg eccentricity, observers accurately match the size of the target rectangle for unflanked conditions. Under flanked (crowded) conditions, the overestimation is independent of target size and increases with flanker size: 0.75, 1, and 1.25 deg flankers result in an overestimation of 0.1, 0.2, and 0.3 deg, respectively. This is pooling.

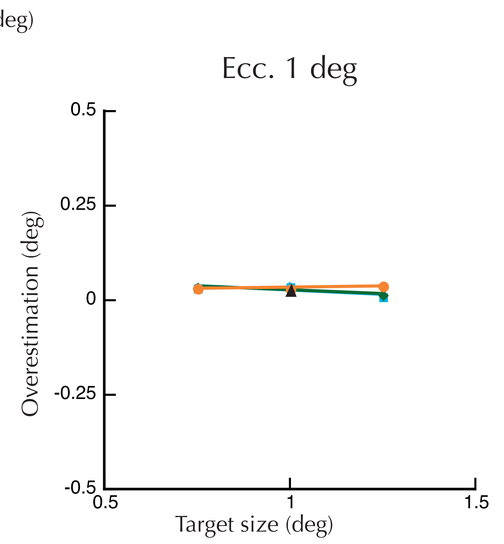


Figure 2. At 1 deg eccentricity, observers accurately match the size of the target rectangle in both flanked and unflanked conditions. There is no crowding and size perception is veridical.

Conclusion

When the target is crowded, size pools.

Granata, Y., Chakravarthi, R., Rosen, S., and Pelli, D.G. (2010). Size pooling. Vision Sciences Society. Naples, Florida. May 7-12, 2010.

http://www.psych.nyu.edu/pelli/posters.html