

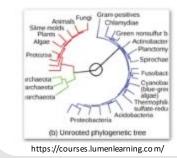
# Perceptual grouping in peripheral vision for information visualization

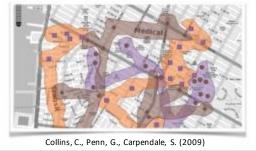
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### Background

Grouping influences crowding<sup>1,2</sup>:

- Behavior and modelling suggest that **grouping** lacksquaretargets away from flankers, even using taskirrelevant features, can reduce crowding<sup>1,3,4</sup>
- Grouping is widely used in information visualizations<sup>5,6</sup>

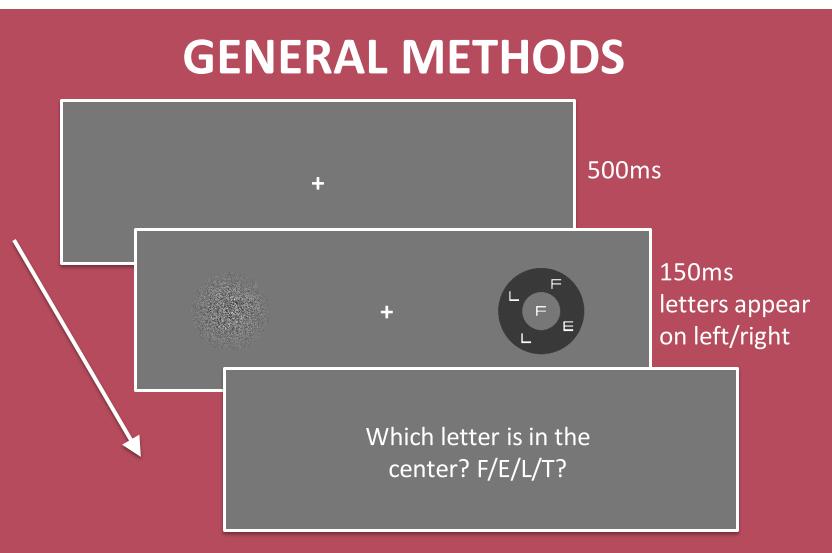




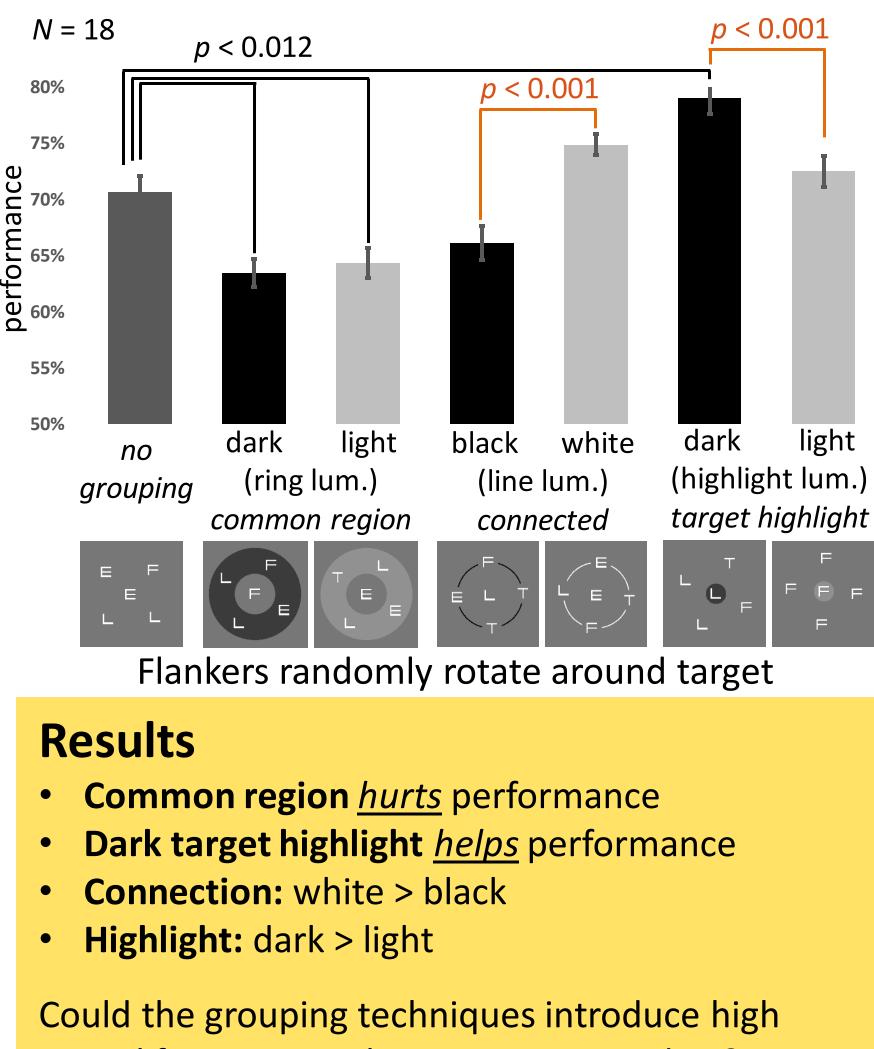
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## Question

Does grouping by **common region** or connectedness alleviate letter crowding?



Eccentricity chosen for 50% - 80% correct (avg. 7.8°) Letters 0.5 x 0.5°, target-flanker distance 2° Trials from all conditions mixed together



Is absolute or relative contrast polarity relevant?

## **GENERAL DISCUSSION**

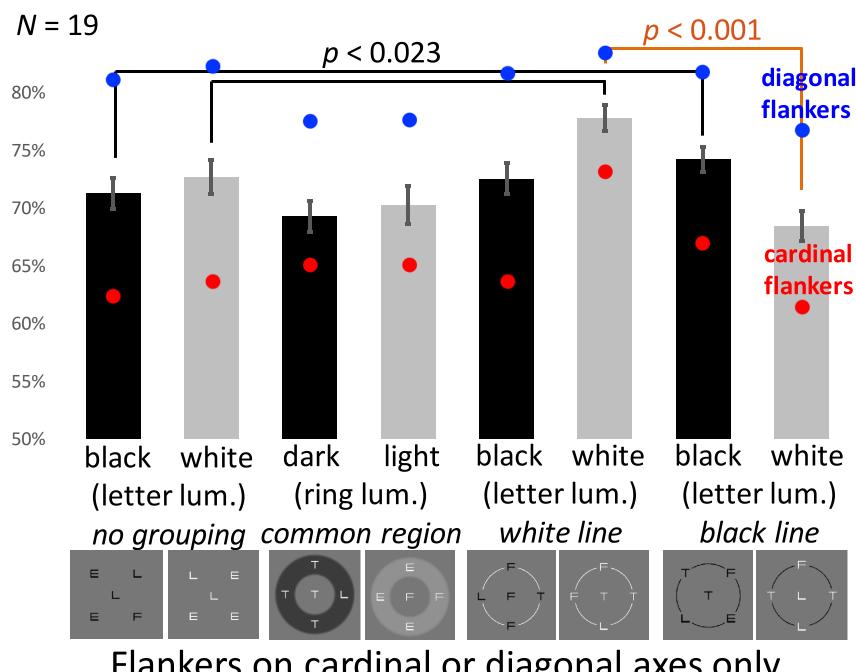
- Grouping targets away from flankers does not always reduce crowding
- Highlighting target by increasing target-background



## **EXPERIMENT 1**

spatial frequencies that increase crowding?

## **EXPERIMENT 2**



Flankers on cardinal or diagonal axes only

## Results

- Soft common region *no longer hurts* performance
- **Connection**: <u>Relative</u> contrast polarity matters same > opposite
- Diagonal flankers > cardinal flankers

### References

[1] Rosen & Pelli, in prep [2] Rosenholtz, R. (2014, 2016) [3] Põder, E. (2006)

[4] Manassi, M., Sayim, B., Herzog, MH. (2012) [5] Collins, C., Penn, G., Carpendale, S. (2009) [6] Ware, C. (2008)

contrast helps target identification

We recommend using a soft edge (common region) and same contrast polarity (connectedness) in information visualizations