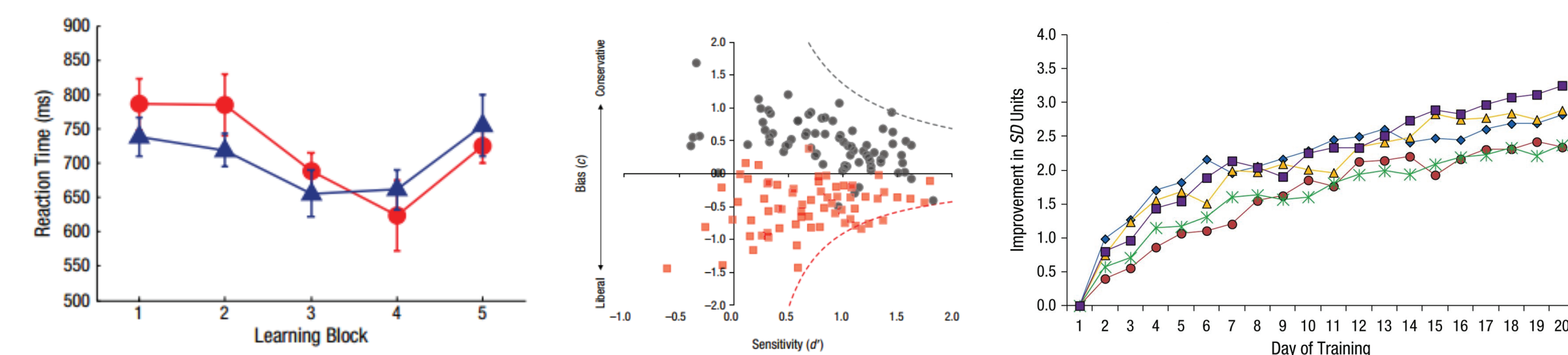


Feature Redundancy Benefits in Different Attentional Modes

Christine Nothelfer & Steven Franconeri

REDUNDANT CODING

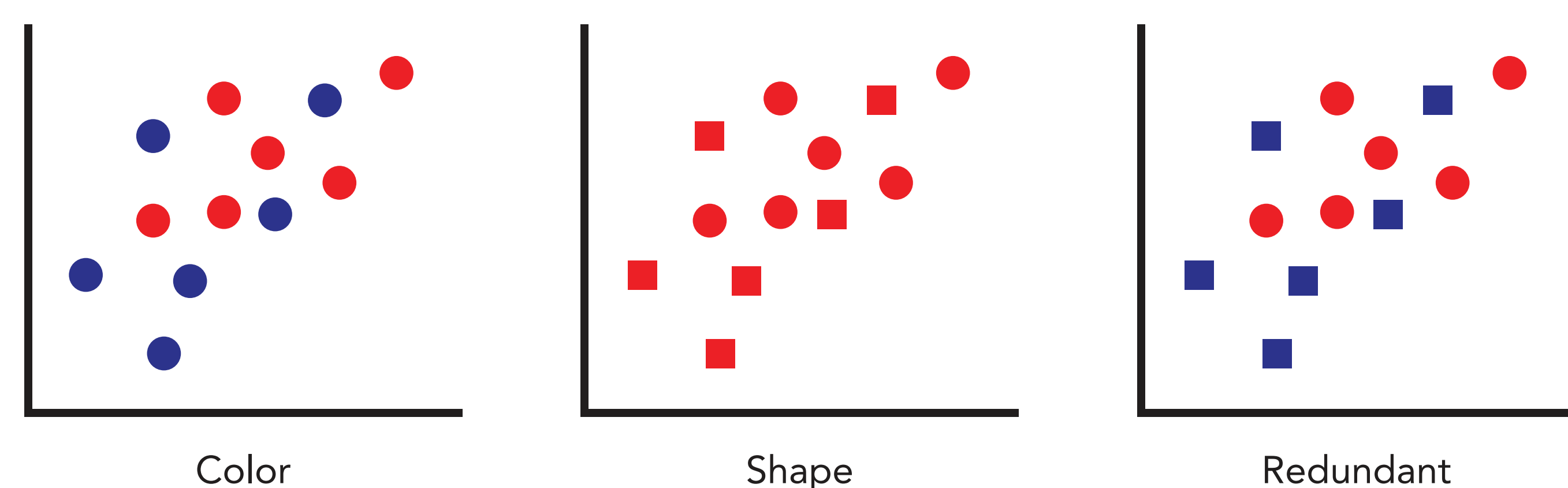


Graphs and maps often depict multiple datasets, or *classes*, that are important to distinguish quickly.

These classes are designated by differences in easily perceived visual features for efficient selective attention¹.

Visual cues are often used in combination as a *redundant coding*².

Redundant coding improves accurate visual selection of objects by 25%, and leads to stronger grouping of the objects³.

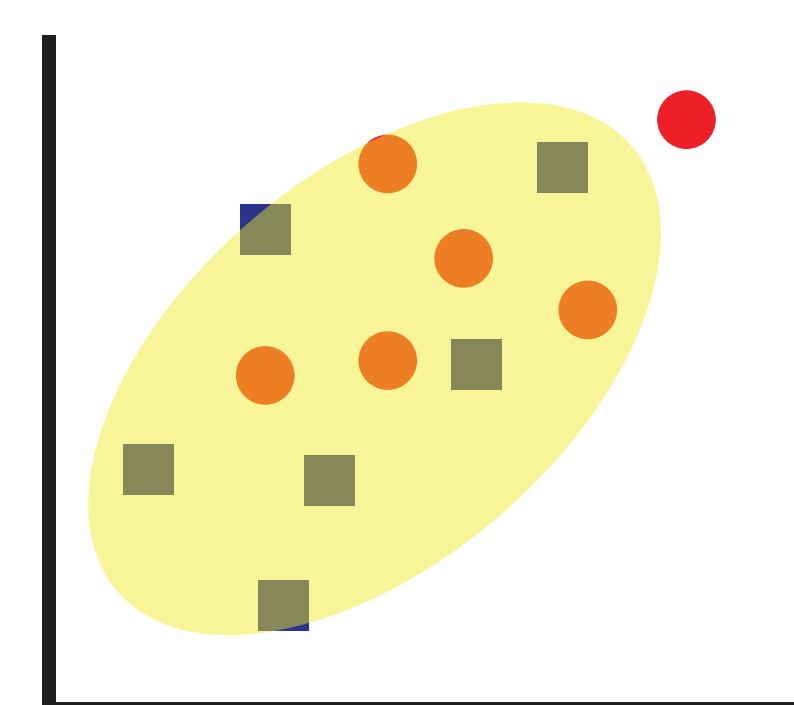


WHEN ELSE ARE THERE BENEFITS?

Does redundant coding lead to response time differences?

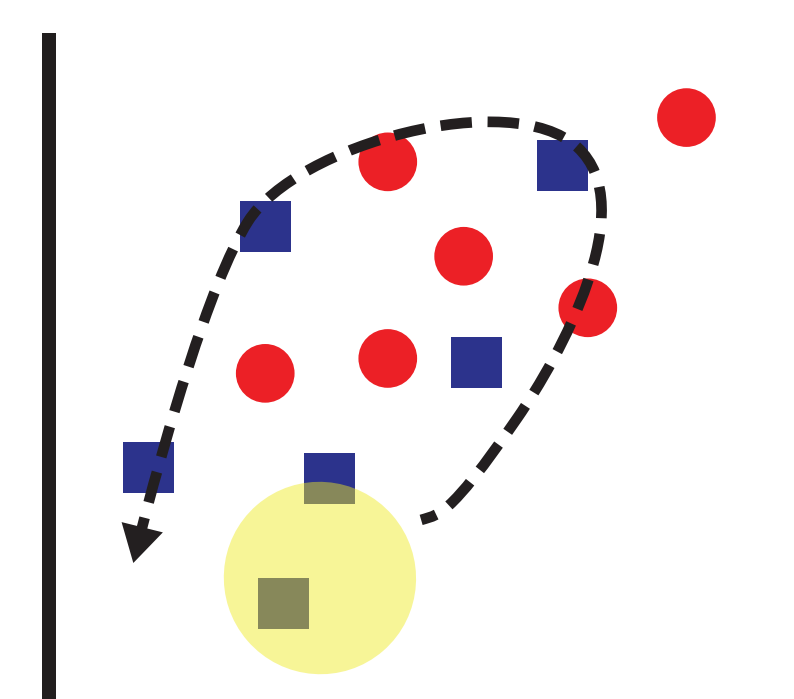
Do redundancy benefits depend on attentional mode (i.e., task)?

Hypotheses:



Global Attention

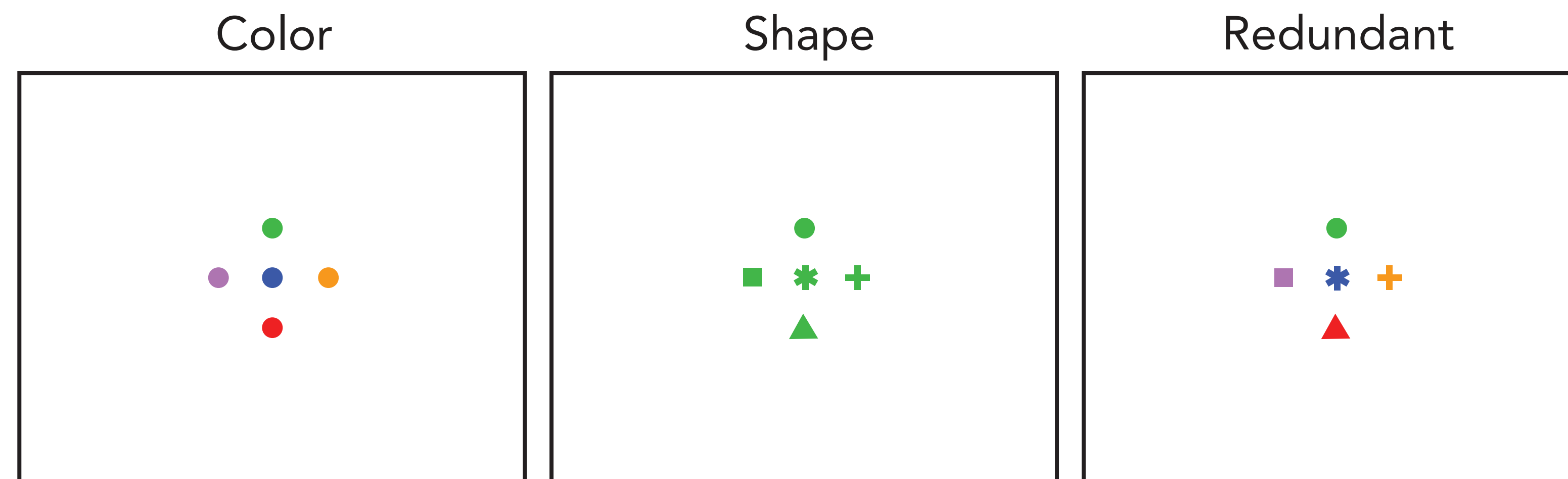
Redundant coding could help strengthen the signal within a noisy representation from dispersed attention⁴.



Local Attention

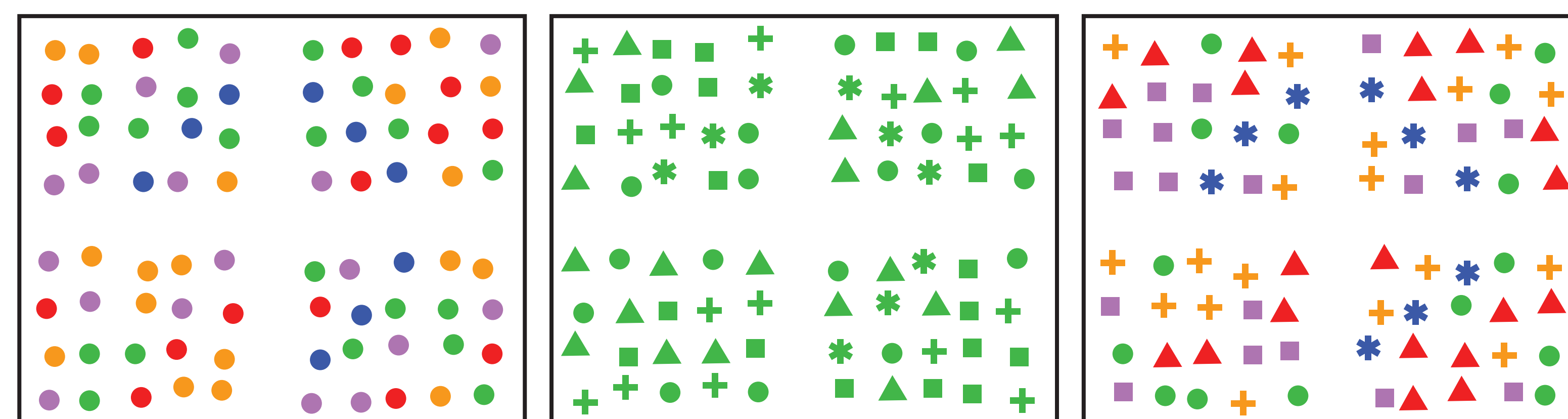
Redundant coding could better guide attention⁵.

TASK



Target (Center) and Distractor Preview (Until Response)

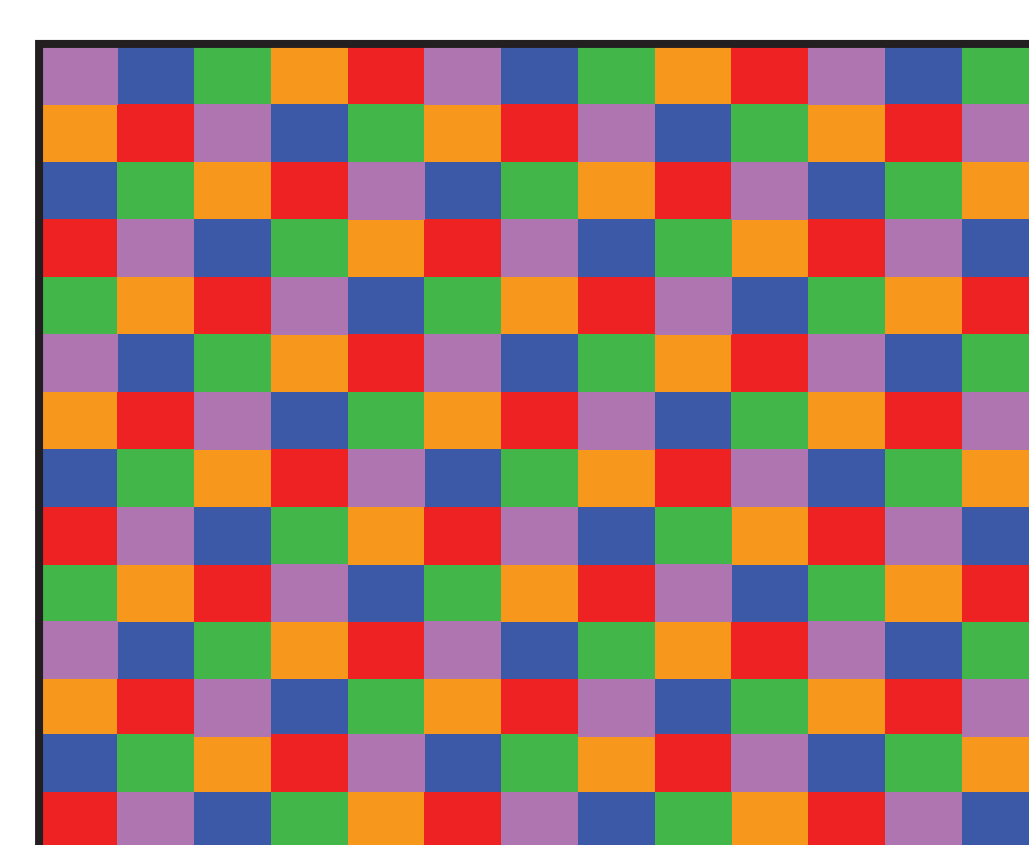
Blank Screen (200 ms)



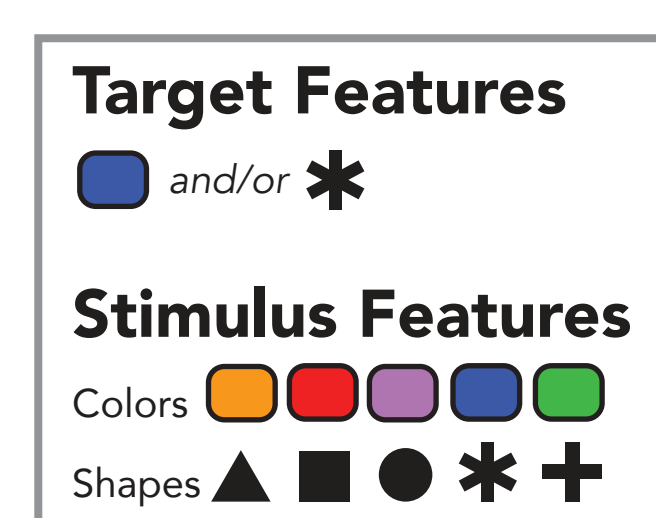
Global Task: Toward which Quadrant is the Ring Gap Angled?

Local Task: Which Quadrant is Missing Target Objects?

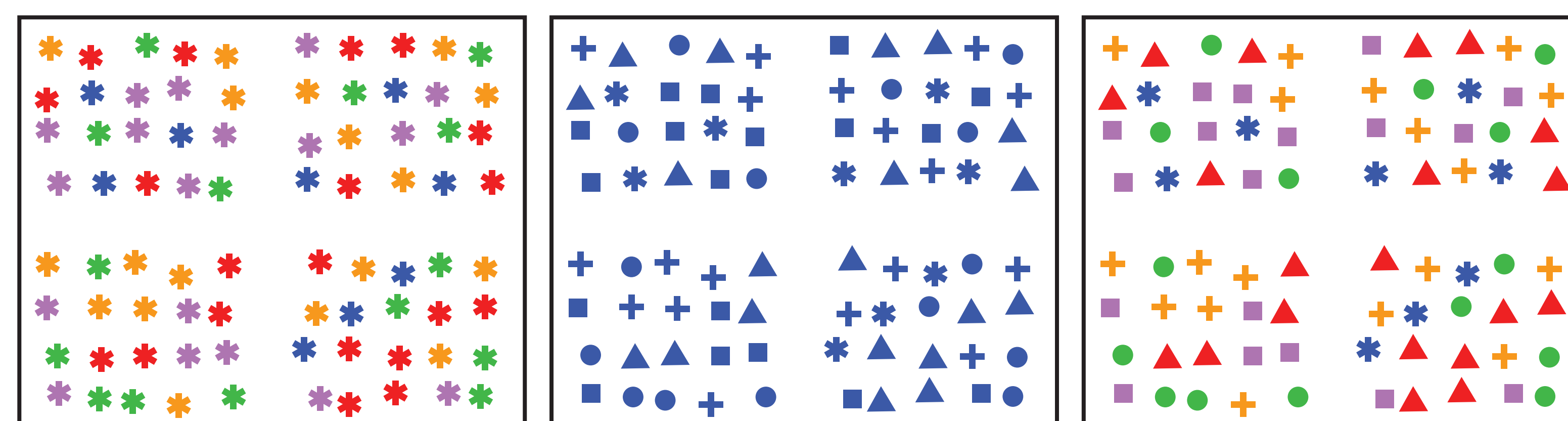
(Until Response, SPACE bar)



Mask (Until Response)



Local Task also contained shuffled displays (40% trials; excluded from analysis) to encourage a local attentional mode:

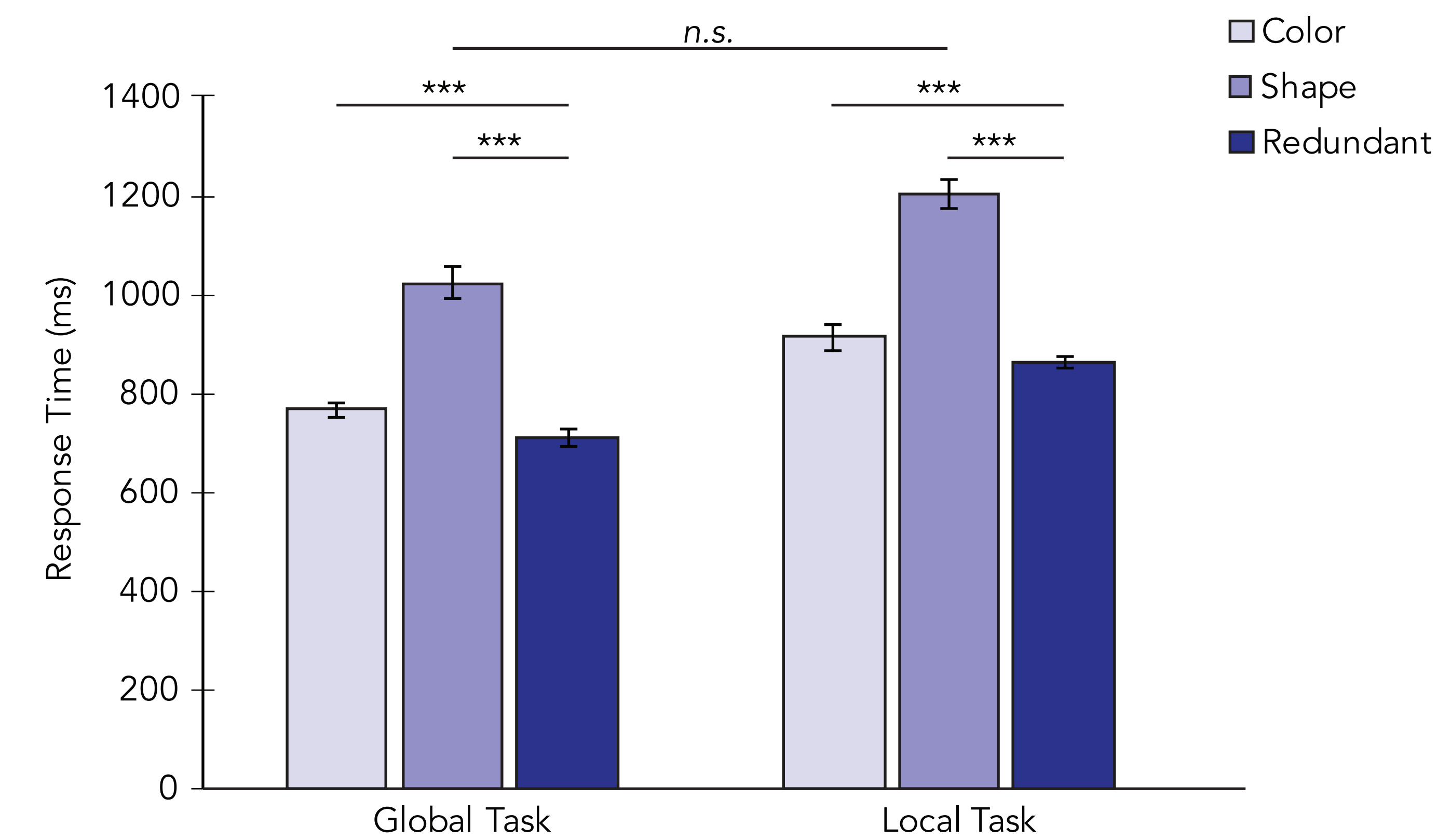


Color

Shape

Redundant

RESULTS



RT benefits from redundant features

(Redundant RT < Color RT -- Global: 58ms, Local: 49ms)

Redundancy benefit does not depend on attentional mode

CONCLUSION

Redundant coding does lead to response time differences in realistic displays, comparable with related work⁶.

Redundancy benefits were robust across attentional modes: this design technique was beneficial in both of our tasks.

Unclear why redundant coding yields a massive accuracy benefit (25%) in prior work³ using a task very similar to our global task.

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