

Examining a Hybrid Account of Saliency-Based Amplification during Perceptual Average Judgments

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Background

- The **amplification effect** holds that the most salient items (e.g., largest, brightest, etc.) within object ensembles overcontribute to perceptual average estimations.^[1]
- The **hybrid account**^[2] suggests this amplification develops in two stages:
 - At the time of perception, all items are equally weighted (i.e., exhaustive sampling).
 - Post-perceptually, a subset of items held in working memory (i.e., partial sampling) gain an undue influence over perceptual average judgements.

Examining the Hybrid Account

- Here, we varied processing durations at the time of perception, from very brief to unlimited durations, and disrupted access to individual items through masking.
- The hybrid account predicts that masking displays will attenuate amplification, whereas increasing/decreasing display duration should have little to no influence on amplification.

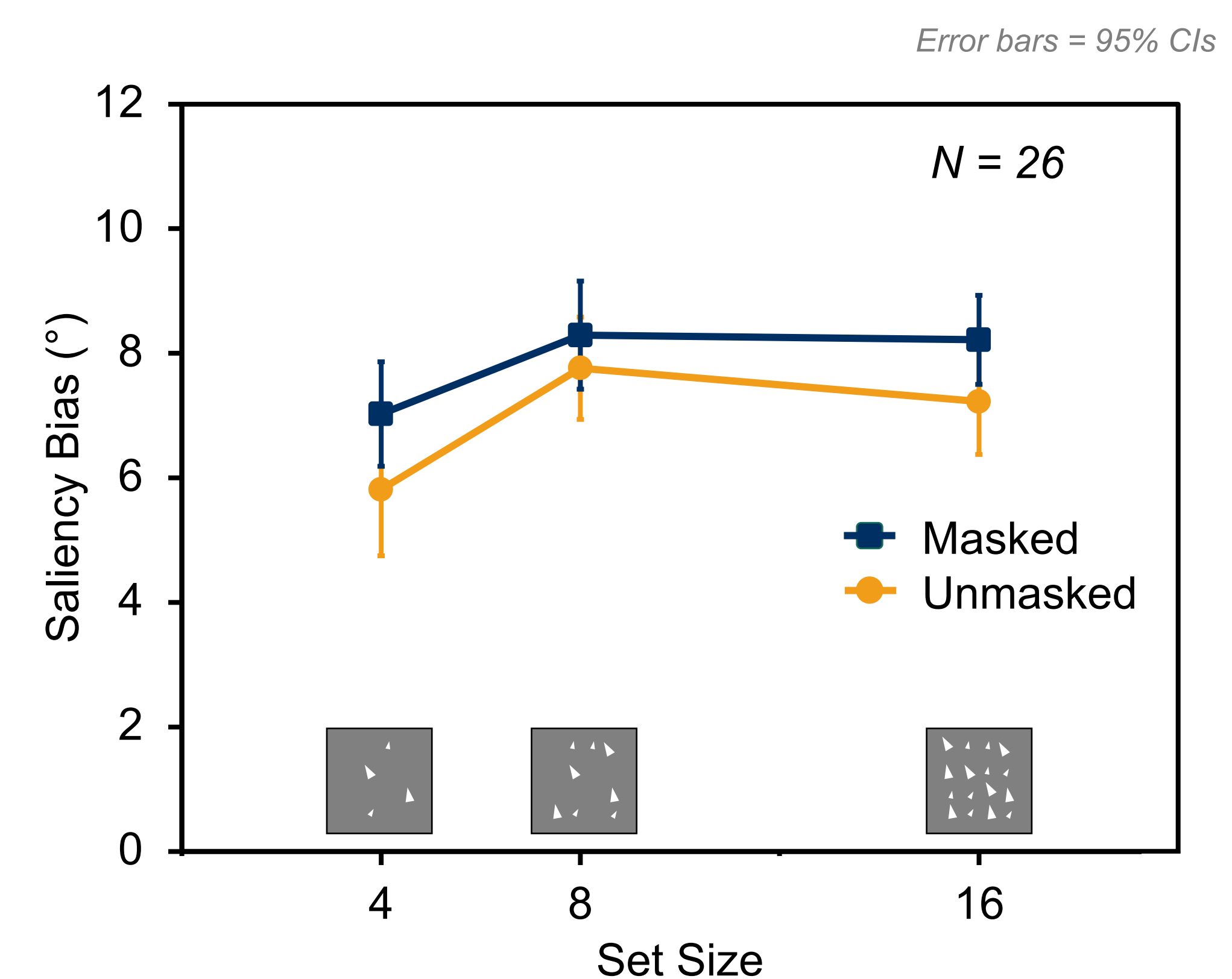
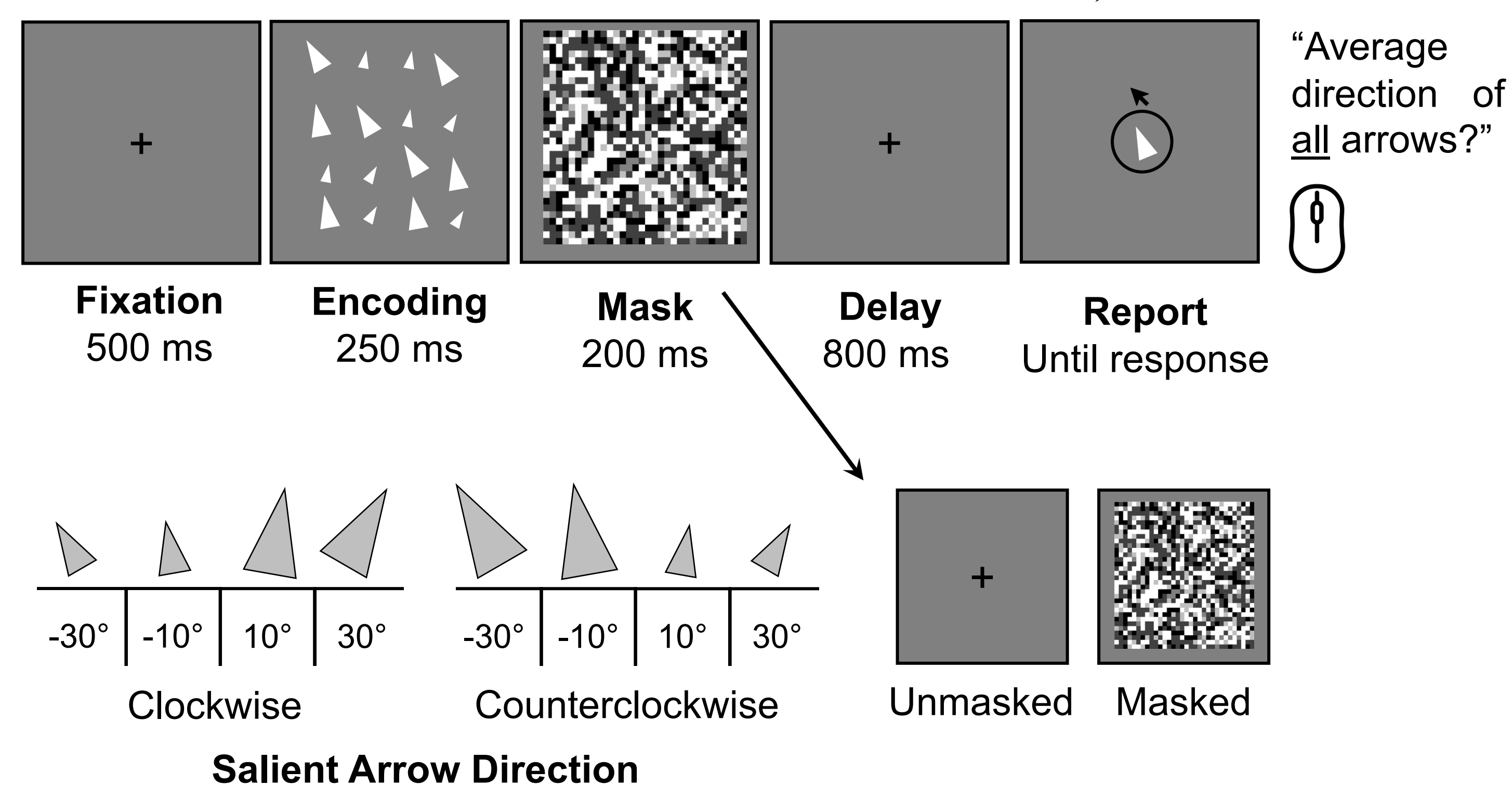
Conclusions

- Our findings do not support the hybrid account of perceptual averaging.
 - Masking generally works to increase rather than decrease the amplification effect during perceptual averaging.
 - Amplification effects are greatest when processing time is short and persist when external access to items is unlimited.
- Instead, our results support partial sampling models, which suggest that a non-random subset of items are prioritized at the time of perception.

EXPERIMENT 1

What is the effect of masking on saliency-based amplification?

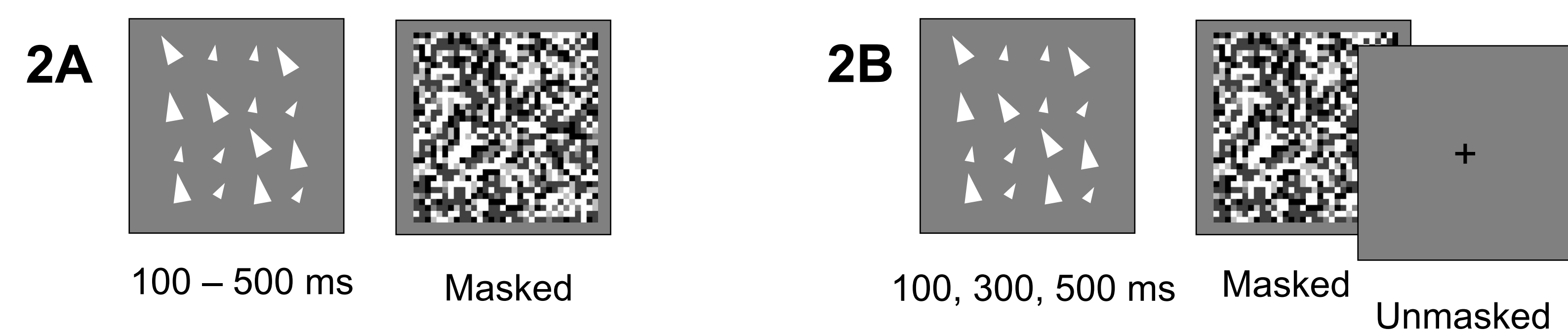
All experiments were run online; task adapted from Iakovlev & Utochkin, 2021^[3].



Greater bias towards salient items at higher set sizes and for masked displays.

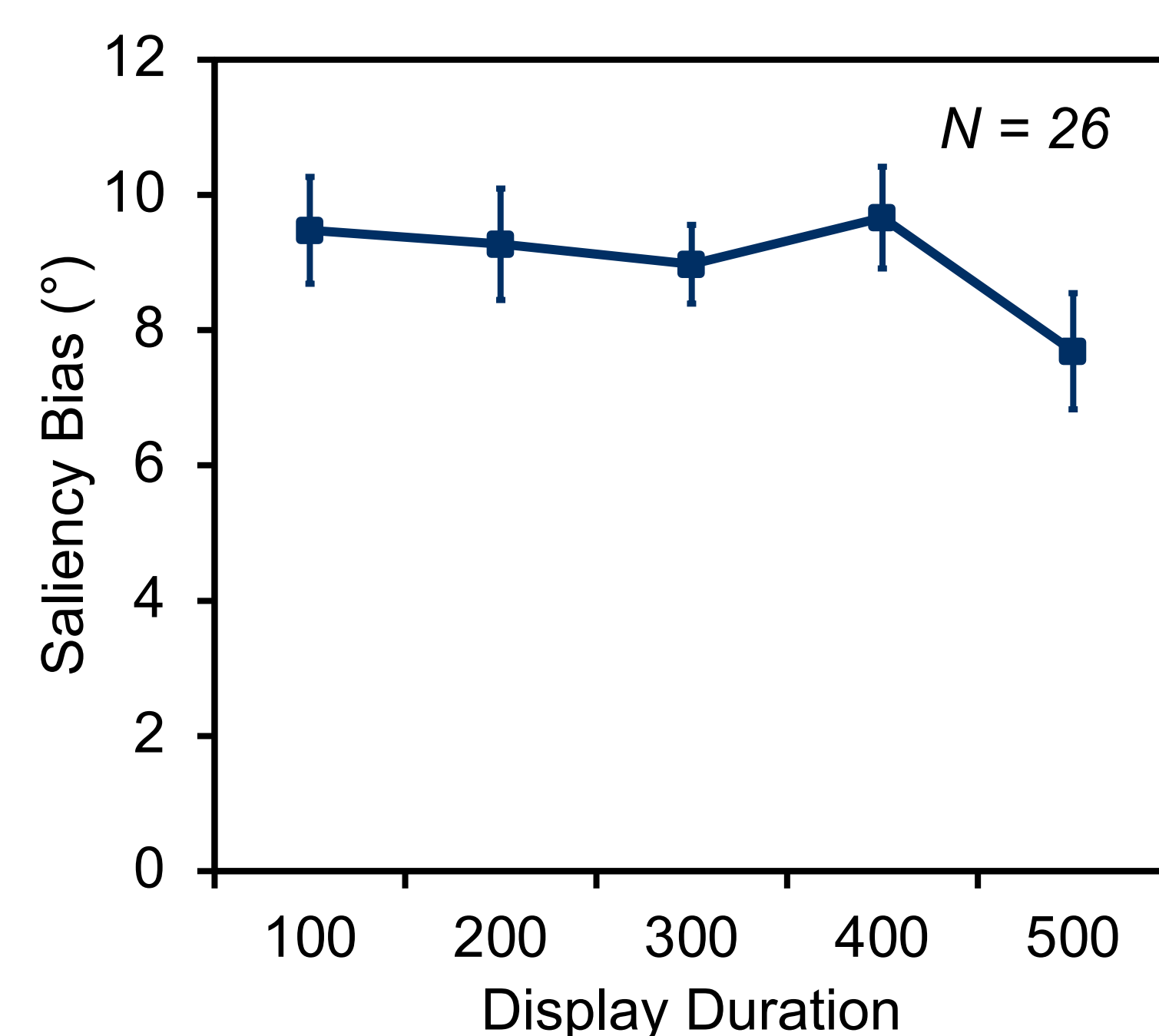
EXPERIMENT 2

Is the effect of masking on saliency-based amplification dependent on the masking latency/display duration?

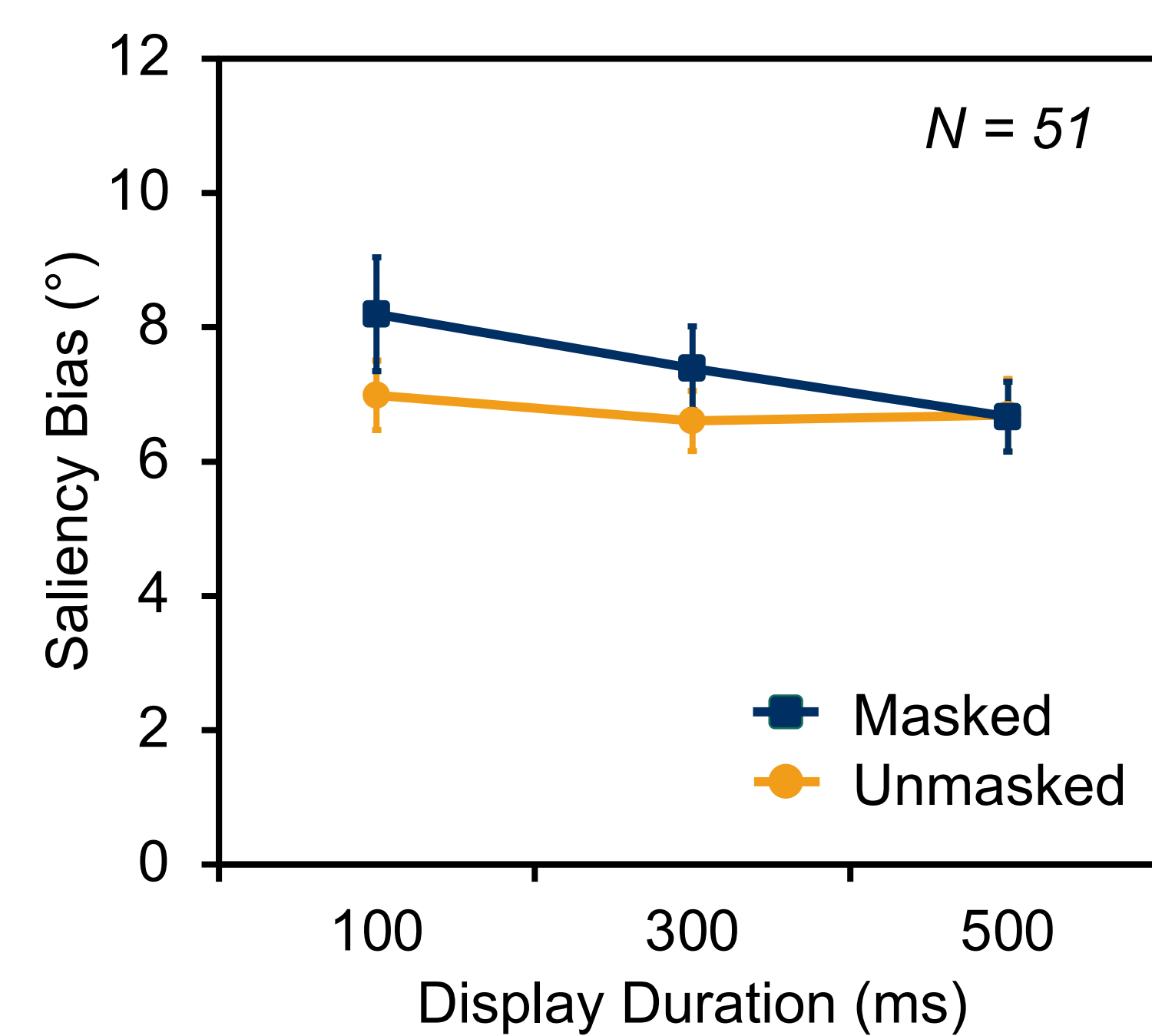


Varied display duration; all displays masked.

Varied display duration; 50% of displays masked.

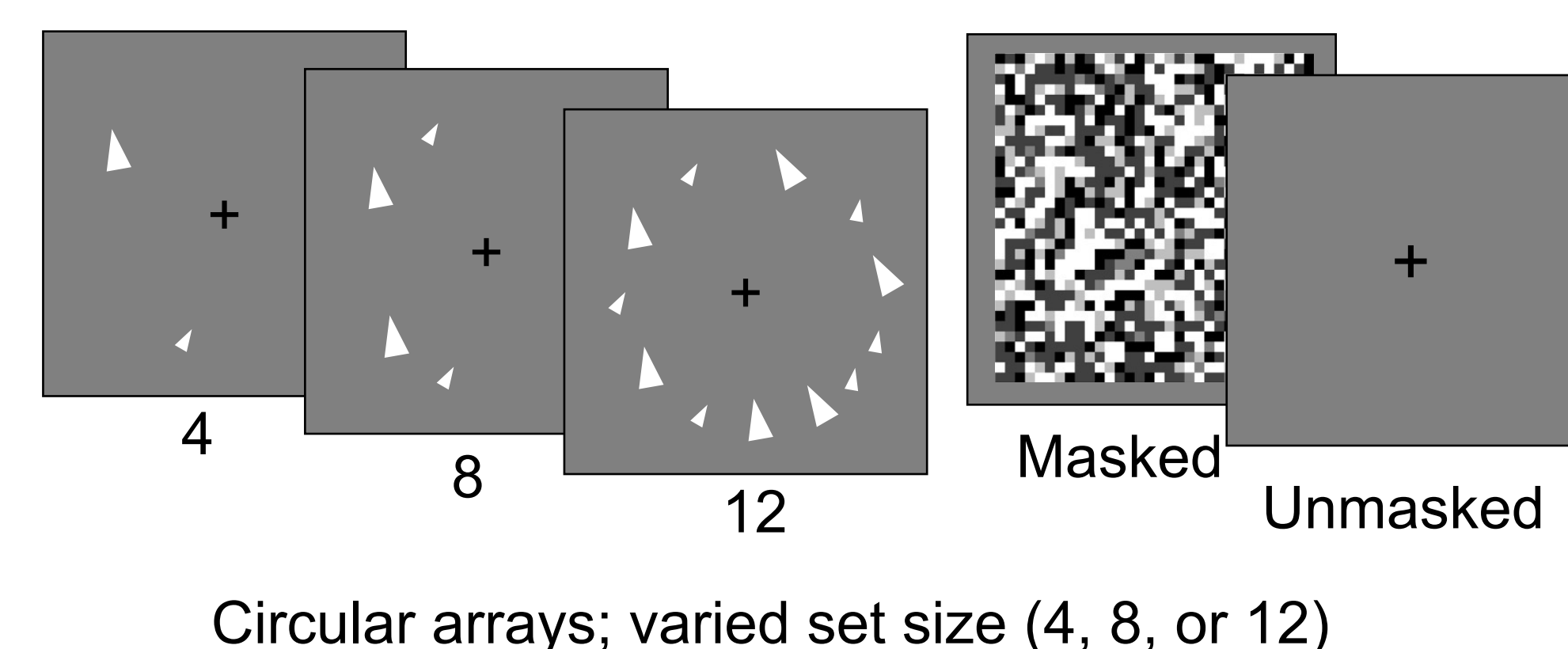


Bias towards salient items is greater when processing time is short and when items are masked.

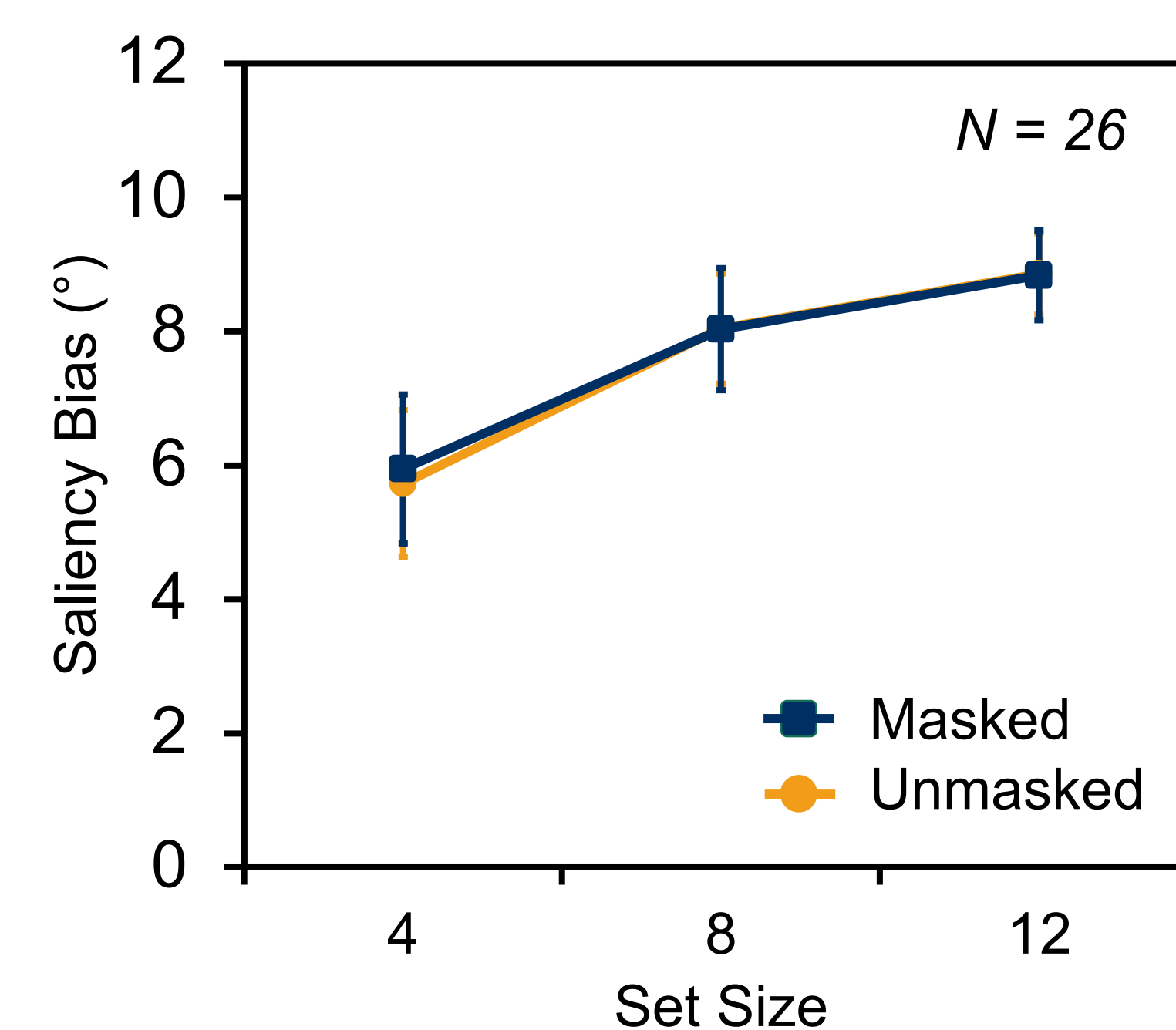


EXPERIMENT 3

Is the effect of masking on the saliency-based amplification effect affected by the arrangement of items?



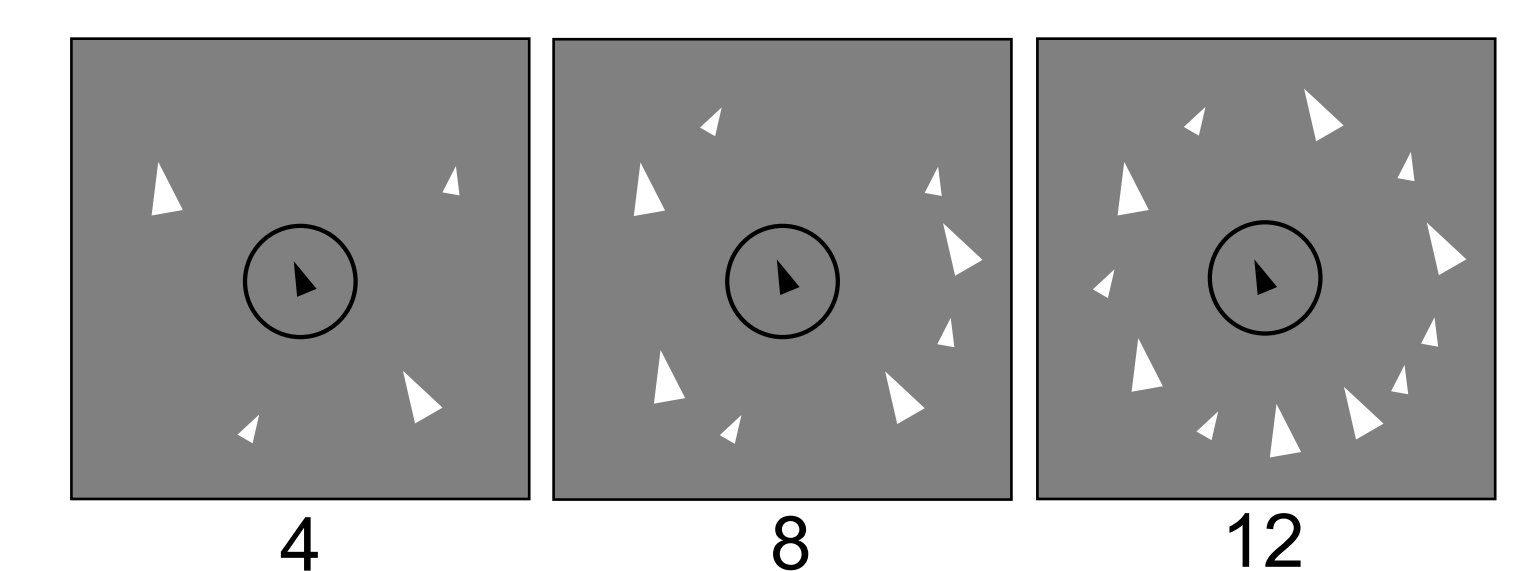
Circular arrays; varied set size (4, 8, or 12)



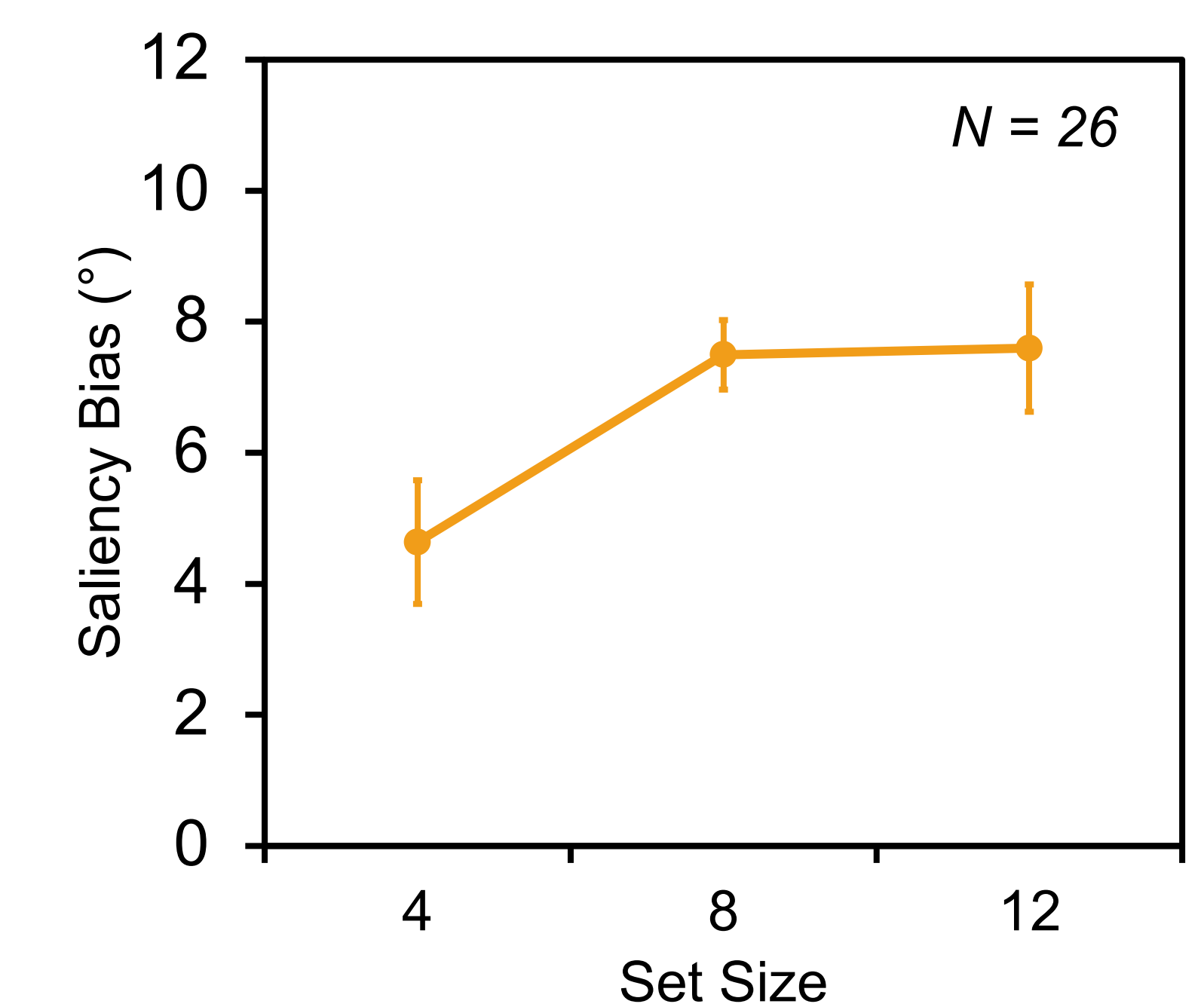
Increased saliency bias at larger set sizes; effect of masking is no longer present.

EXPERIMENT 4

Is saliency-based amplification observed when individuals are given unlimited access to arrow displays?



Average direction judgments made while items remained onscreen (i.e., simultaneous judgments).



Saliency bias remains present when processing is unrestricted, particularly for larger set sizes.