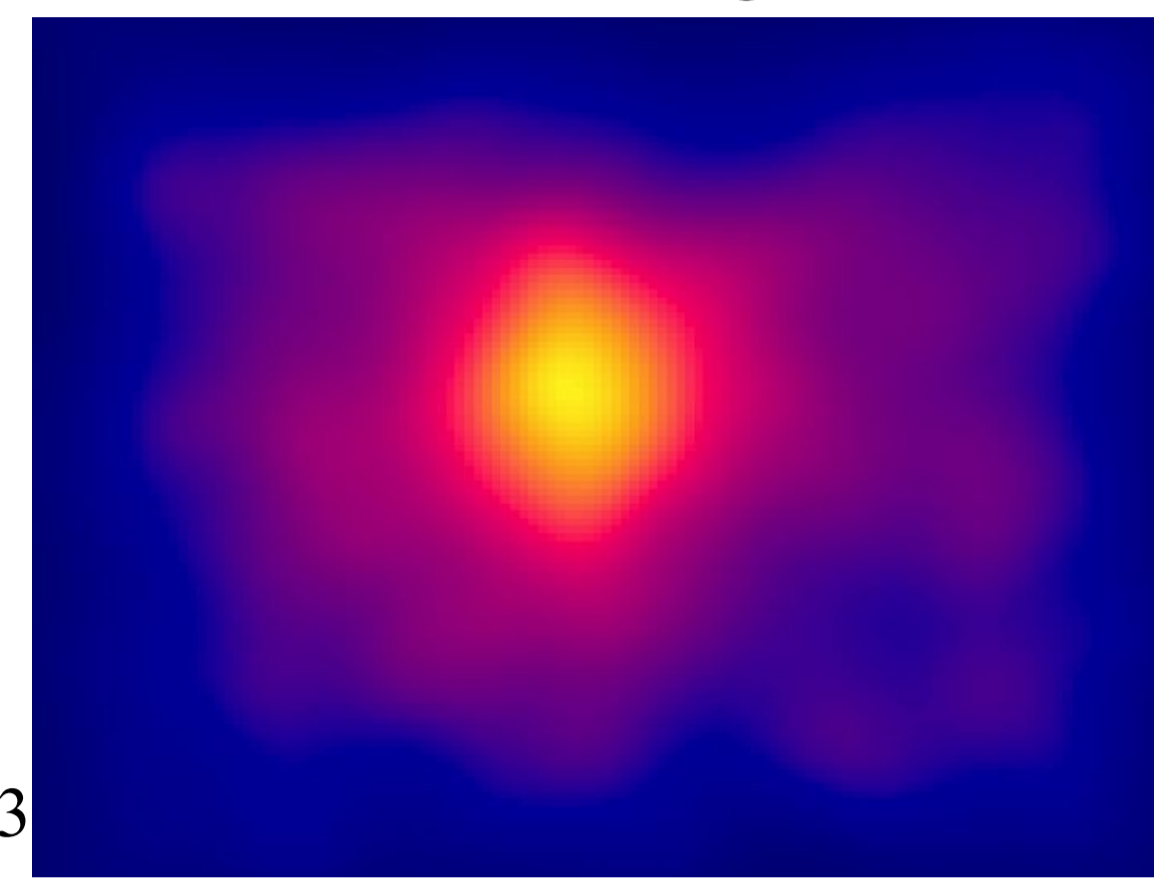


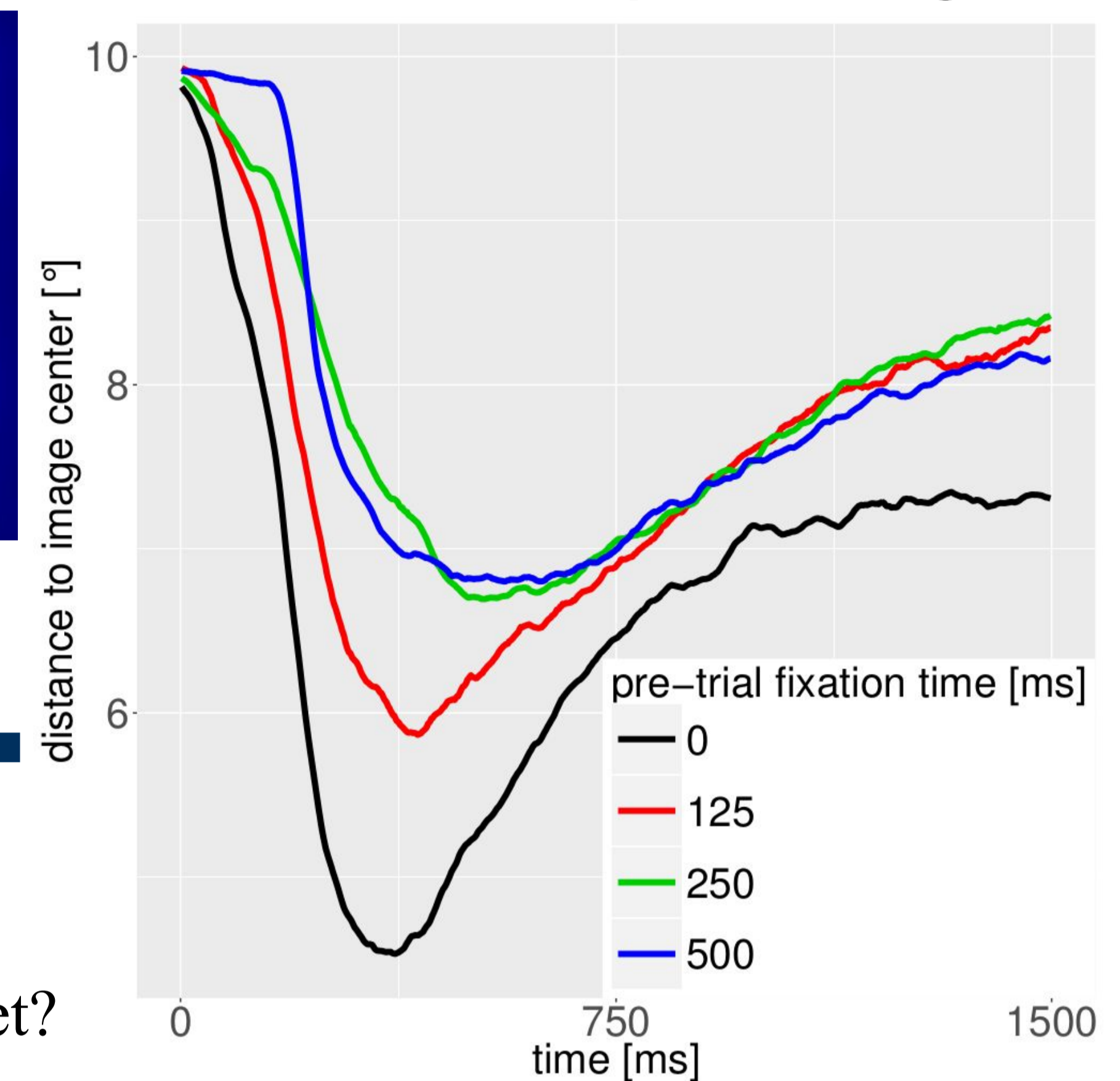
Introduction

- The **Central Fixation Bias (CFB)** shapes early viewing behavior in scene viewing experiments¹
- Participants make the first saccade towards the center of the image
- The effect persists through experimental changes in **monitor** and **fixation cross** position, as well as **feature distribution**^{1, 2}
- CFB can be significantly **reduced** when participants view the image from predetermined positions for as little as **125ms** before exploration³

Fixation density



Reduced CFB when preview is given

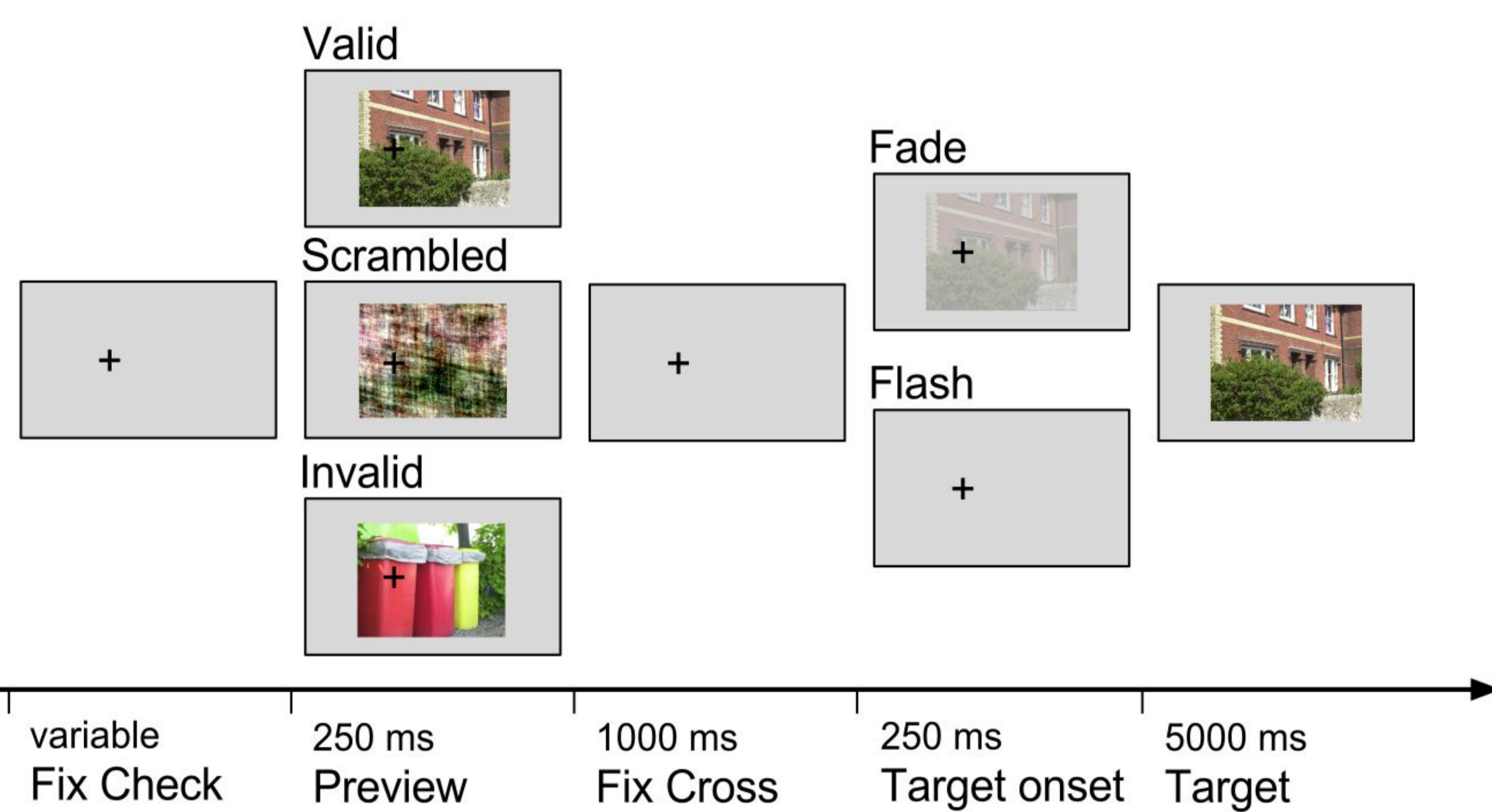


Research Question

Is the **CFB reduction** caused by...

1. **early gist extraction** during the first forced fixation?
2. experimental prohibition of saccades in **reaction to a sudden luminance change** at target onset?

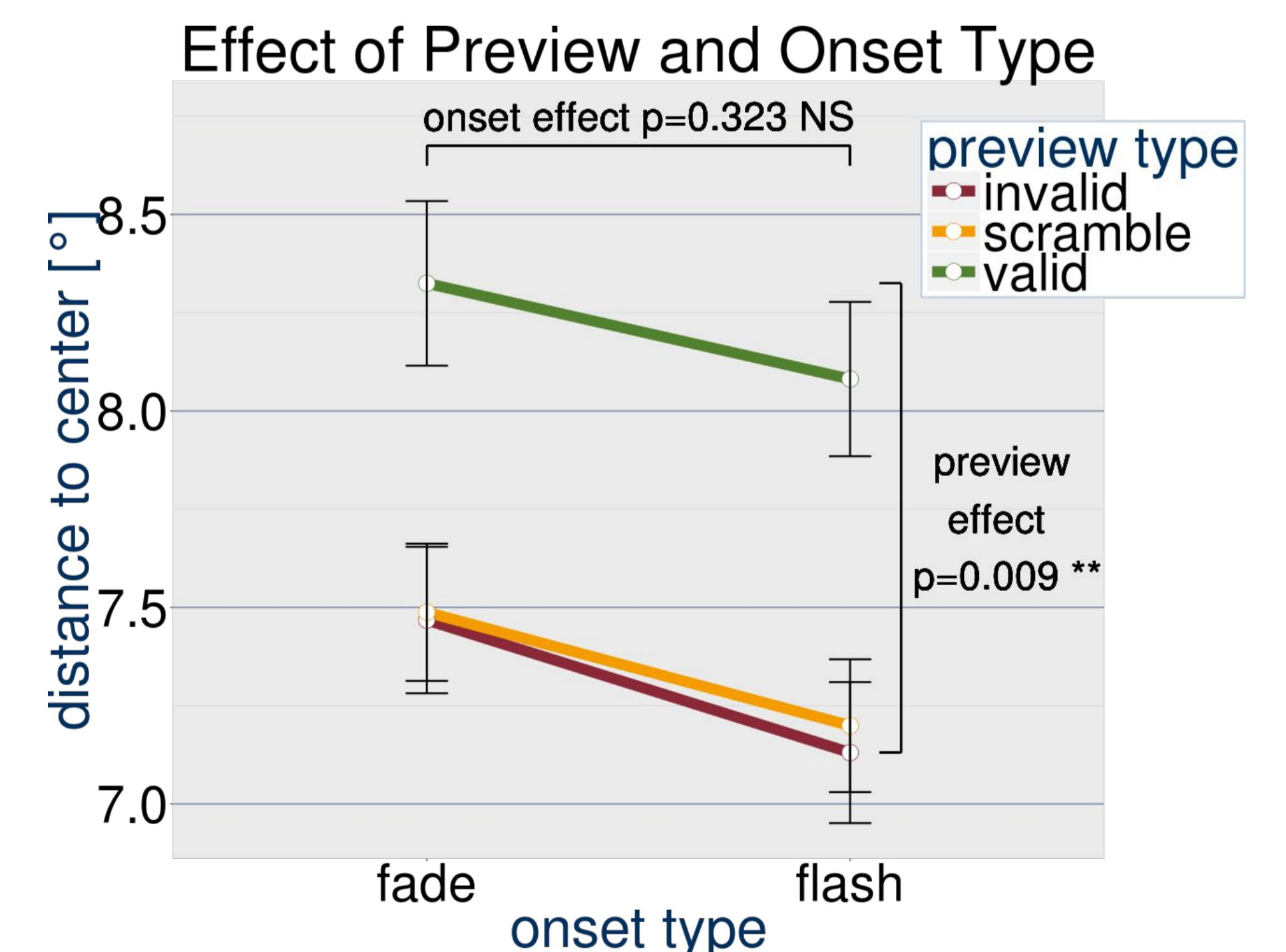
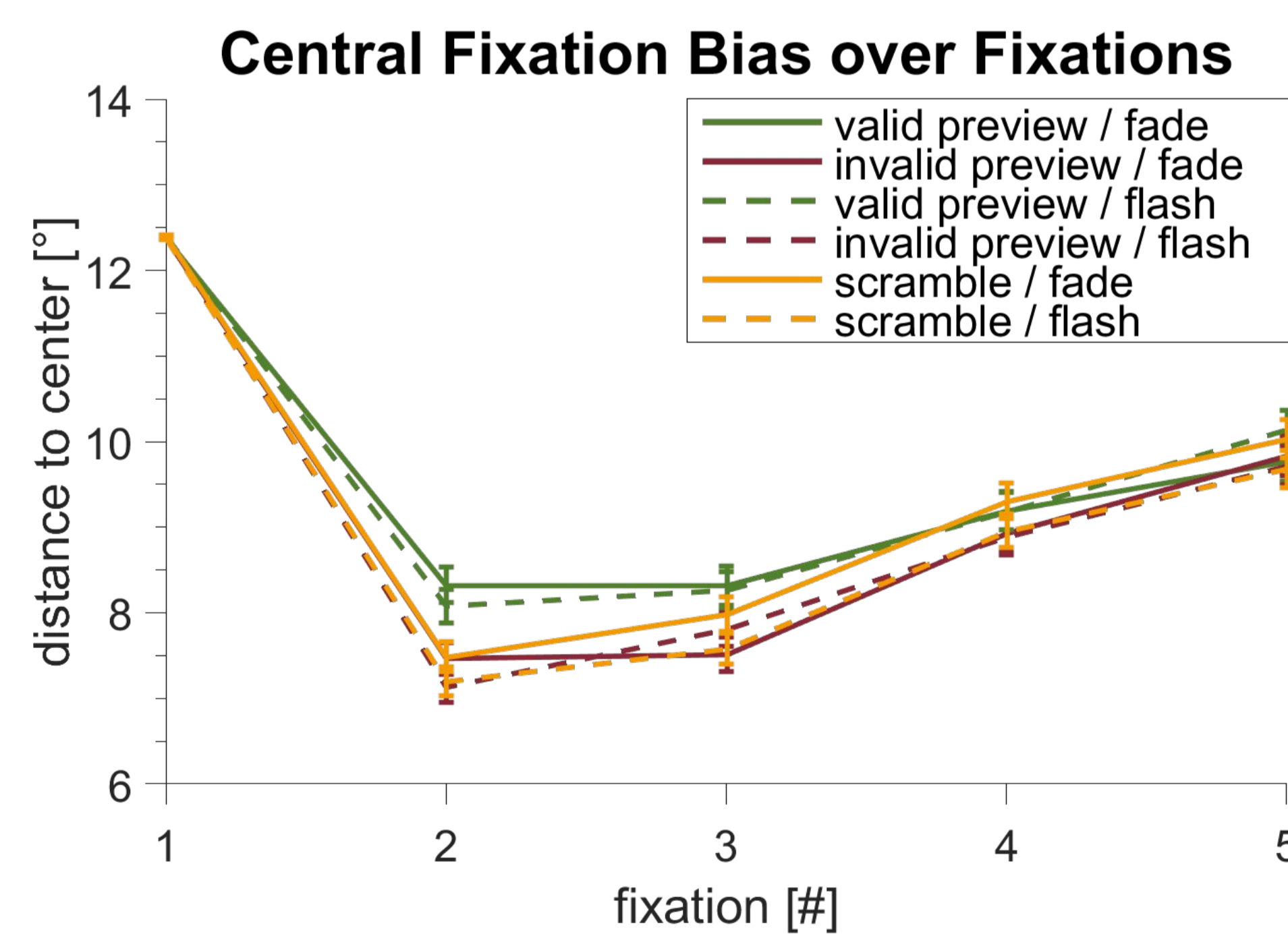
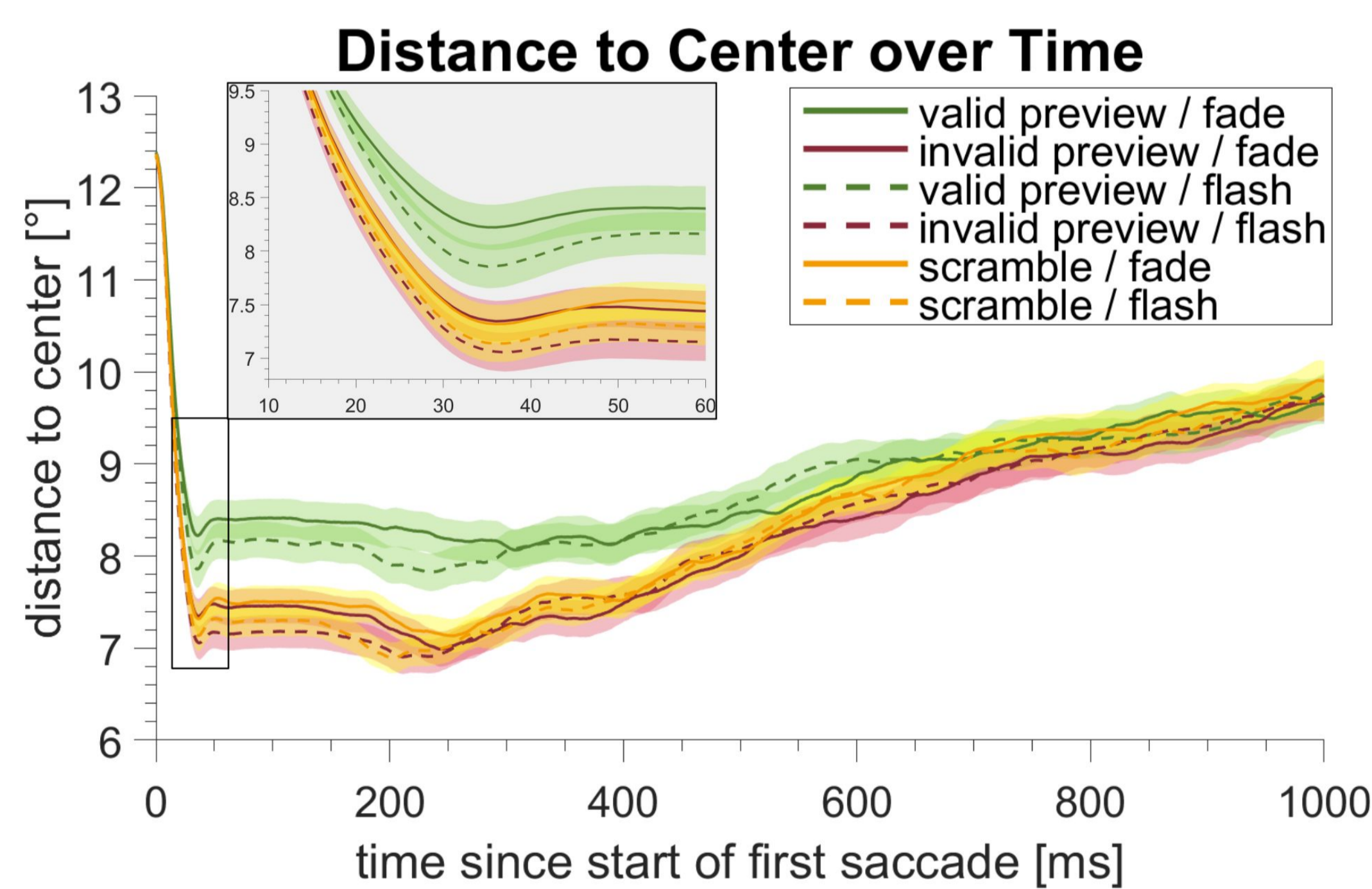
Method



- Eye tracking experiment (Eyelink 1000, SR research)
- 32 participants
- 20 images for each of 6 conditions in a blocked 2x3 design
- Preview types:
 - **valid** (same as target)
 - **invalid** (different from target)
 - **phase scrambled** (only spatial statistics are preserved)
- Image onset types:
 - **flash** (regular appearance of an image)
 - **fade** (image gradually increases in visibility)

Results

- Significant effect of the **preview type** ($p=0.009$)
 - **Valid** preview conditions elicited a less pronounced CFB than invalid or scrambled previews.
- Onset type ($p=0.323$) and interaction ($p=0.951$) were not significant
- Overall the CFB was smaller than in previous experiments, possibly caused by different presentation sequence



Conclusion

The CFB is primarily caused by **early gist extraction** with the image center as the optimal fixation location. We were able to significantly reduce the central fixation bias by giving subjects a 250 ms preview of the target image compared to invalid and scrambled previews. Onset type had no determining role in the strength of the bias.

References

- 1) Tatler, B. W. (2007). The central fixation bias in scene viewing: selecting an optimal viewing position independently of motor biases and image feature distributions. *Journal of vision*, 7 (14), 4.1–17.
- 2) Vitu, F., Kapoula, Z., Lancelin, D., & Lavigne, F. (2004). Eye movements in reading isolated words: evidence for strong biases towards the center of the screen. *Vision Research*, 44 (3)
- 3) Rothkegel, Lars OM, et al. "The temporal evolution of the central fixation bias in scene viewing." arXiv preprint arXiv:1610.05982 (2016).