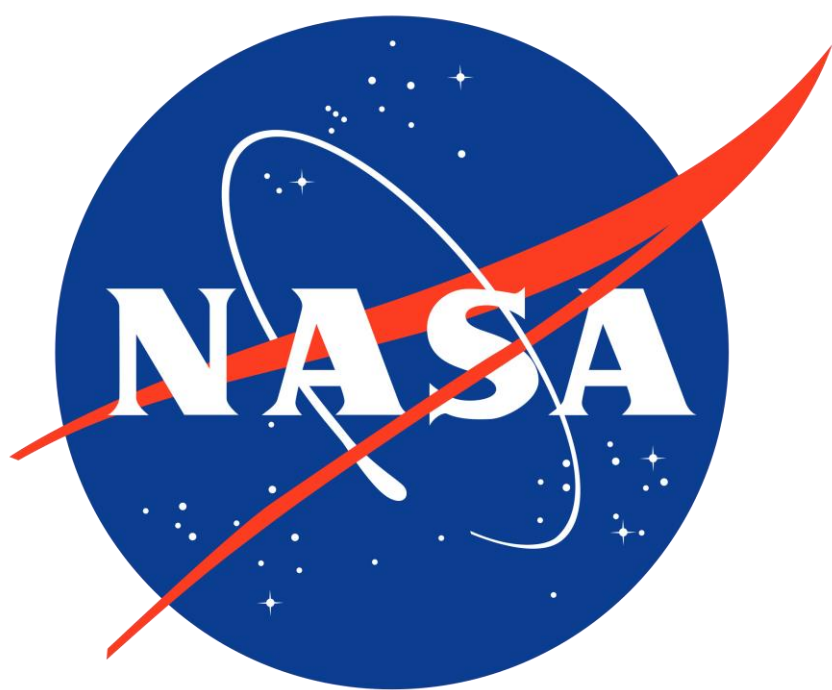


# Distortion of Perceived Visual Space after Eccentric Gaze Holding

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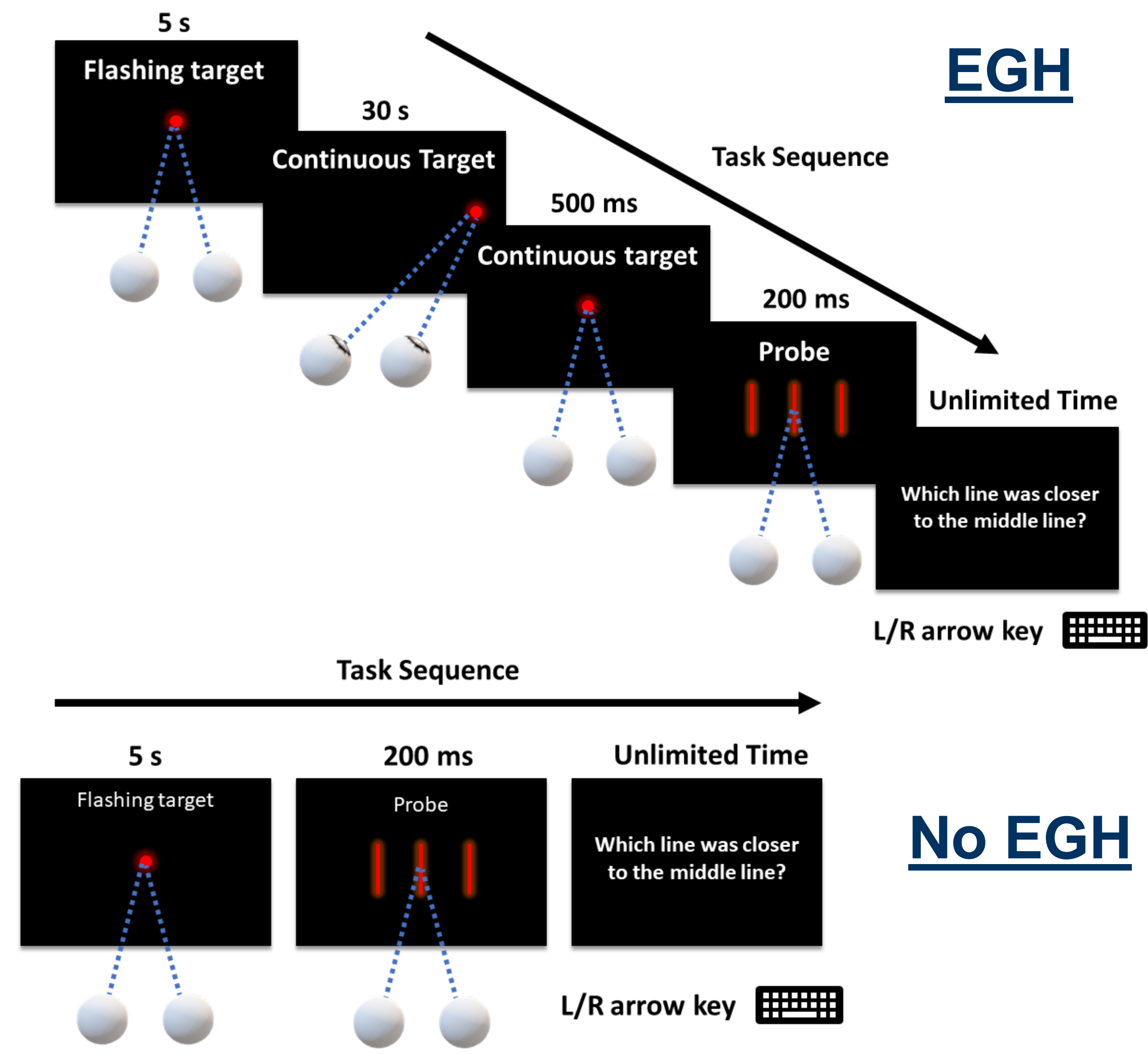


## Introduction

Rebound nystagmus has been shown to be a behavioral probe into the *adaptive* properties of the gaze-holding mechanism, showing that after prolonged **eccentric gaze holding (EGH)** and upon return to central gaze, the eye tends to drift towards the previously held position [1]. Does the perception of space also have a similar adaptive mechanism? The current study seeks to elucidate how holding eccentric gaze changes the perception of space in a relative spatial judgment task.

## Methods

12 subjects (30.1 ± 3.5 years old; 6 females) reported which among two short vertical lines flashed to the left or to the right of the display was closer to a third central line. One line was always at 20 deg and the other one varied from 15 and 25 deg. Perception was assessed after holding eccentric gaze at 40 degrees towards the left or right and compared with control trials without eccentric gaze holding.



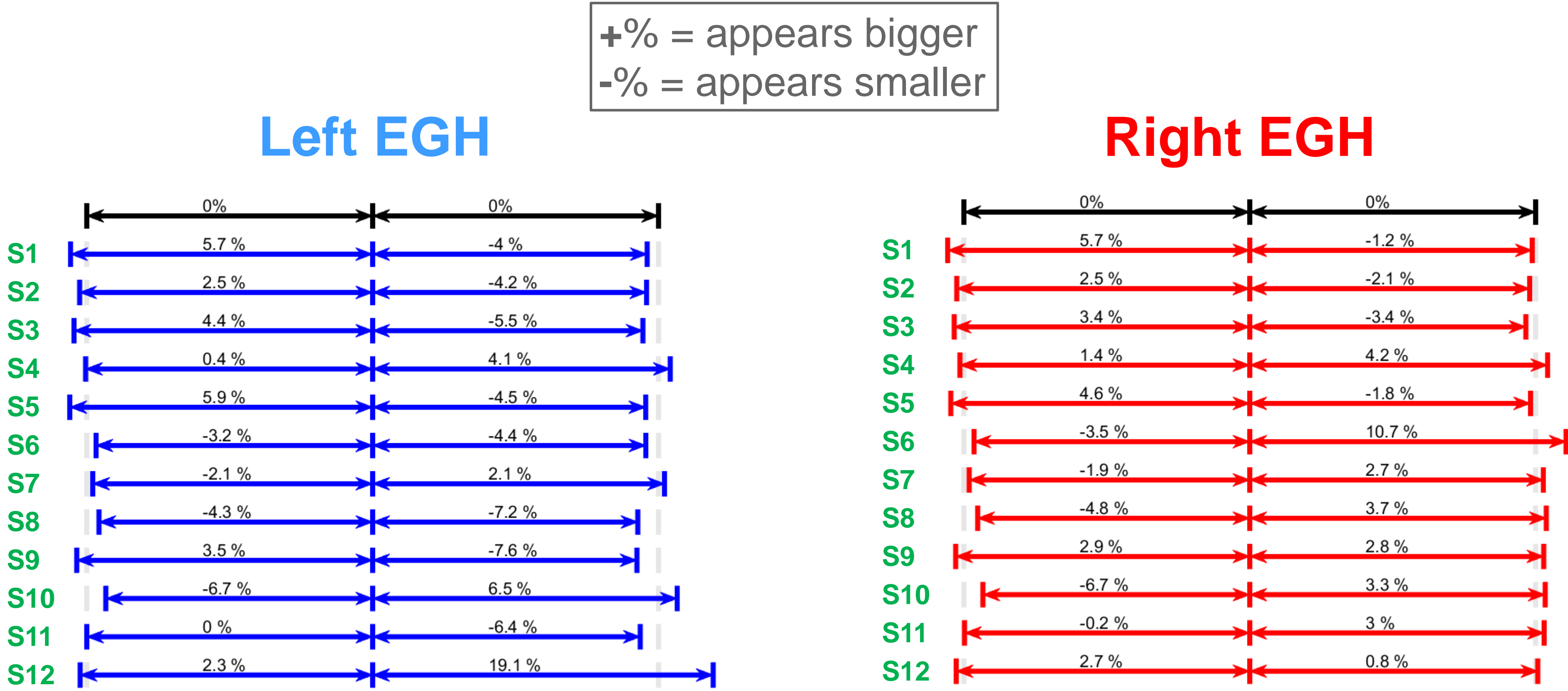
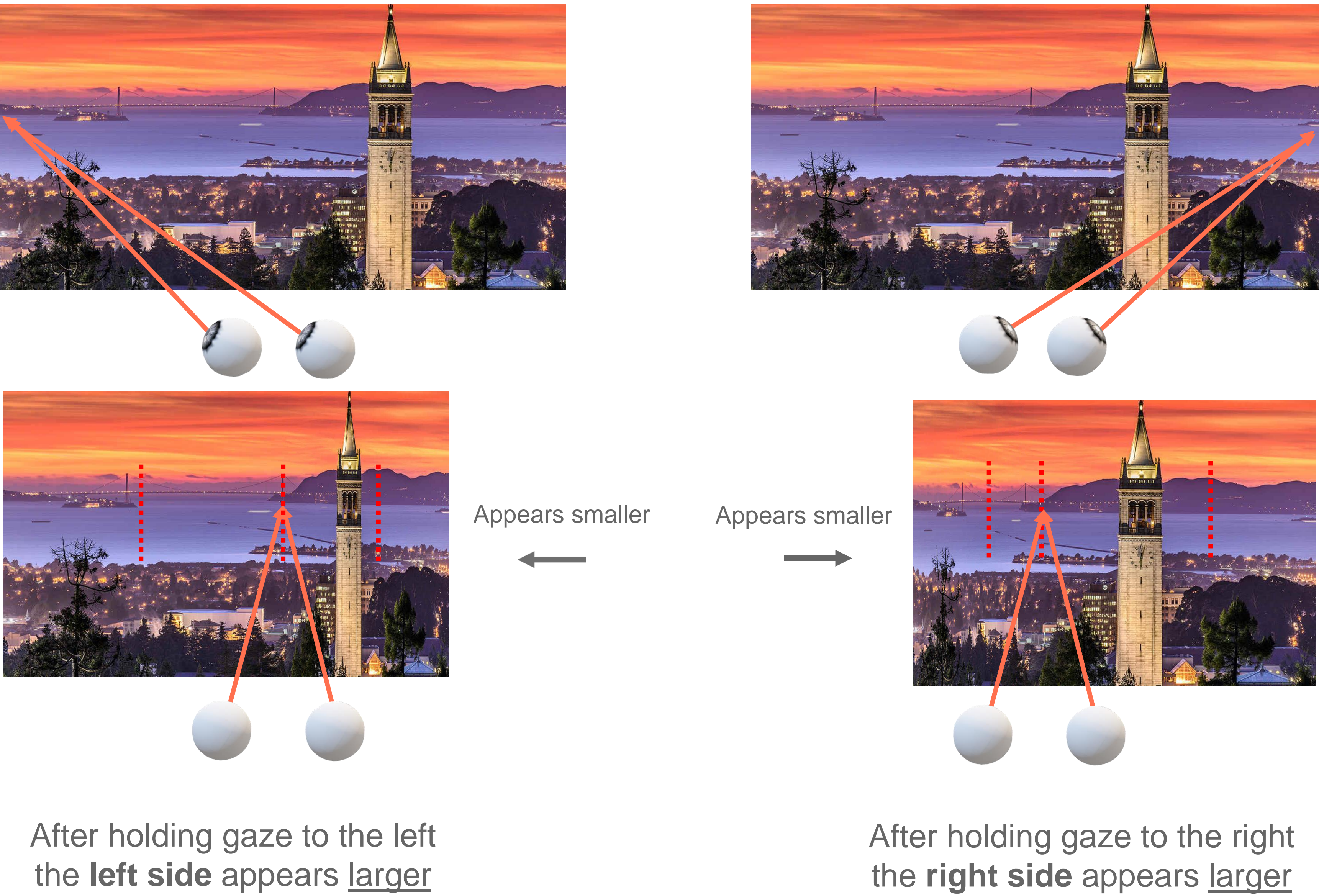
## References

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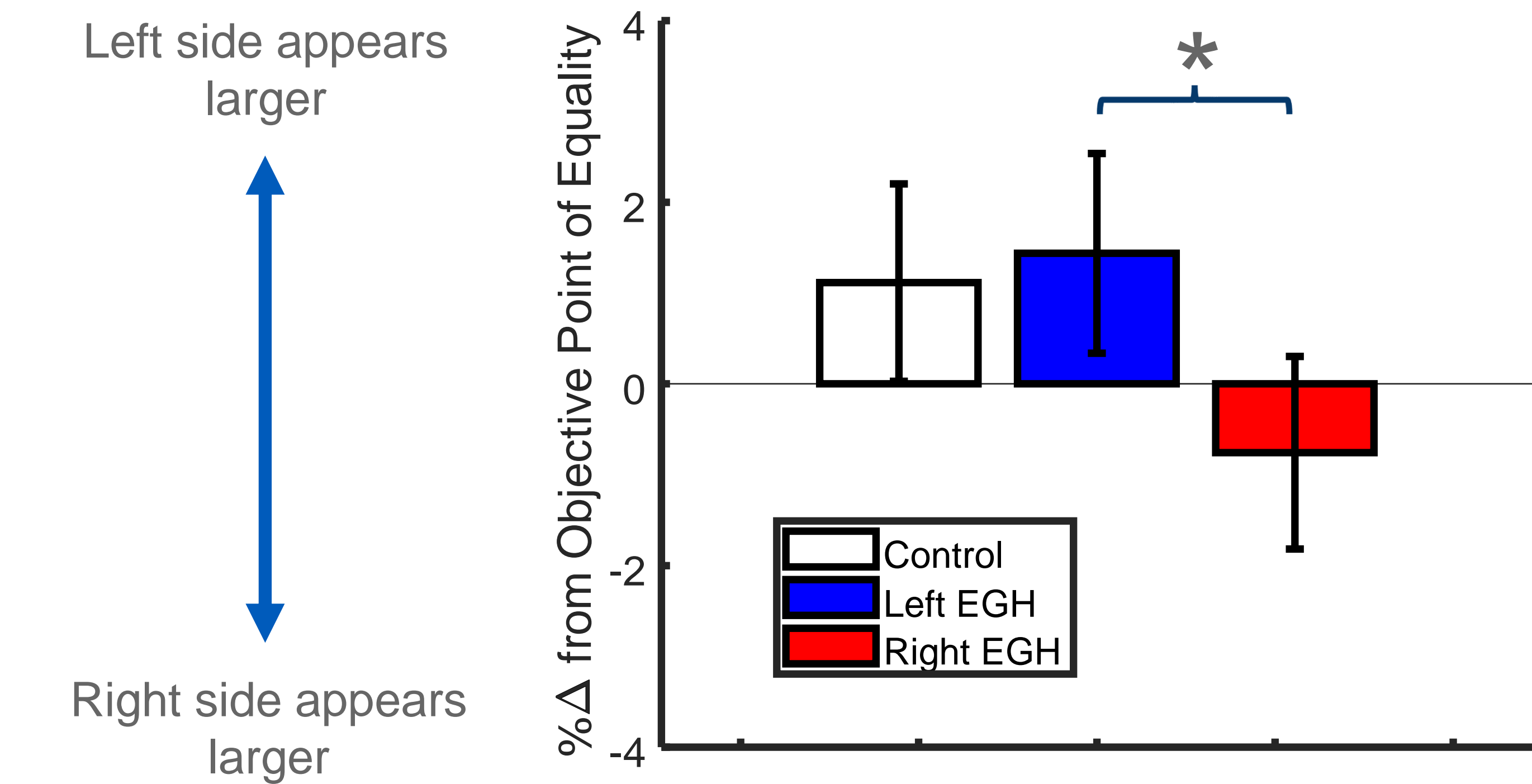
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## Spatial Distortion and Eccentric Gaze Holding

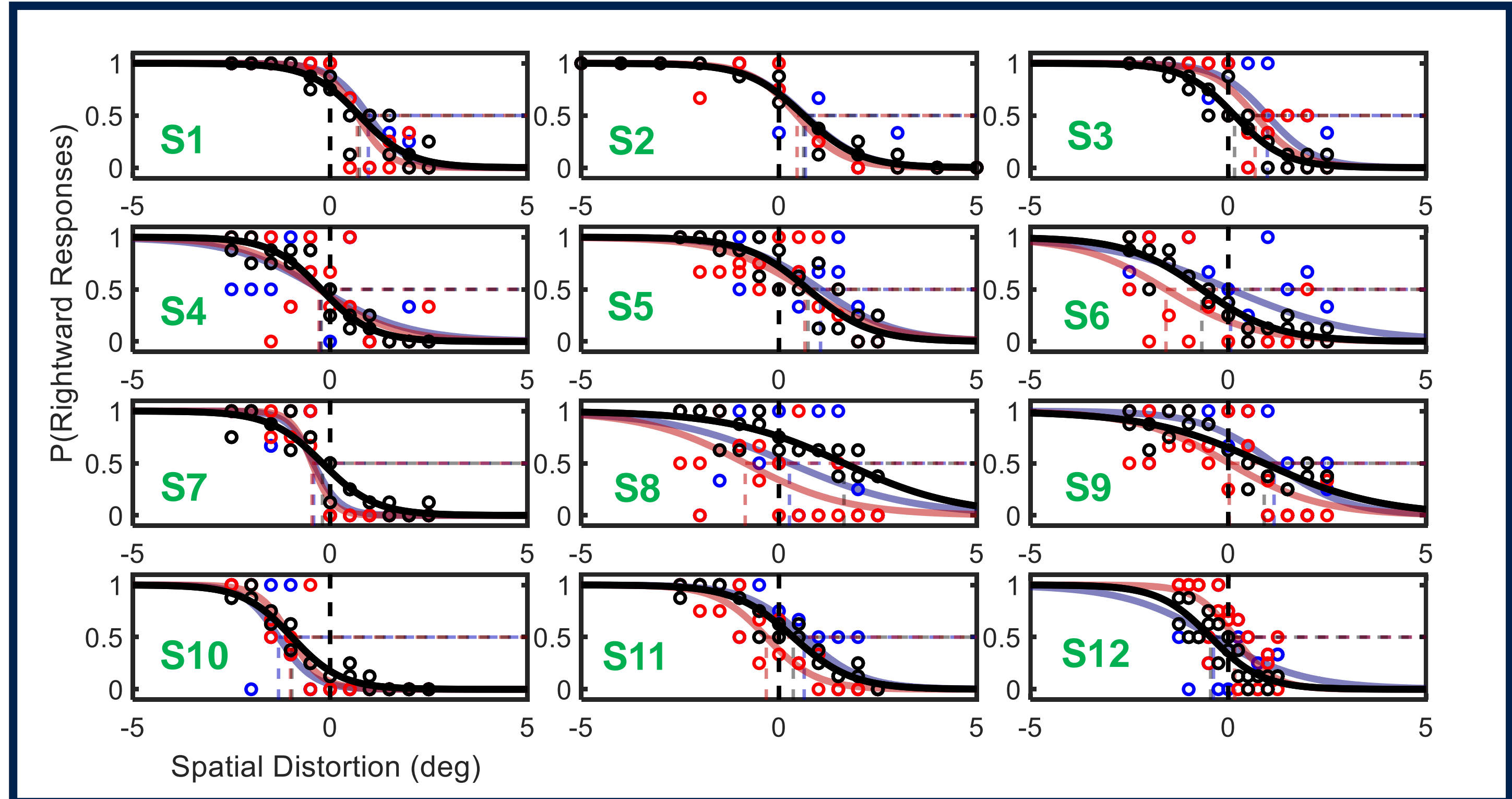
We calculated the spatial distortion as the difference between the perceived left and right eccentricities of the lines. Below is an example of how spatial distortion can be induced by gaze holding. Note: this assumes a lack of binocular disparity and that the visual target is on a frontoparallel plane. A future study will consider these factors in order to account for phenomena such as the slant effect [2].



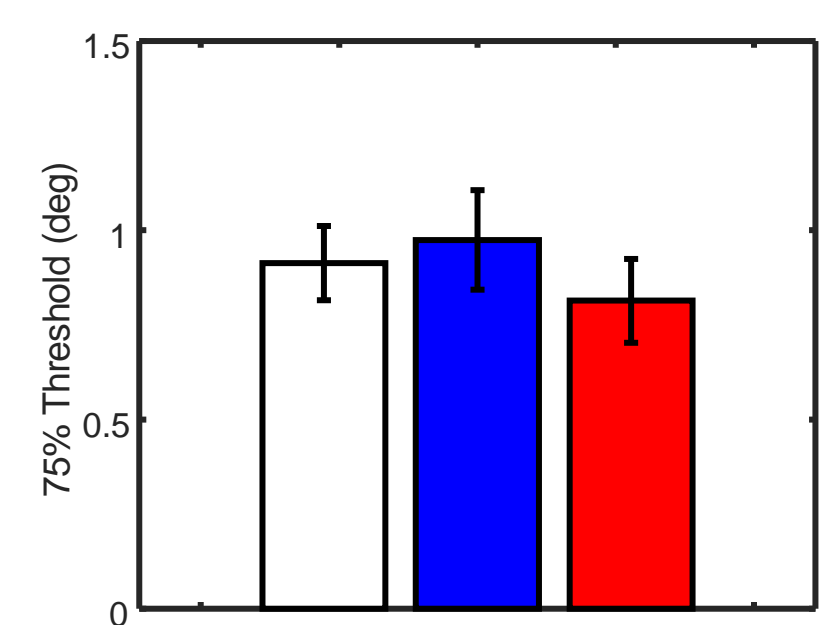
Arrows indicate the perceived relative size difference of the left and right side.



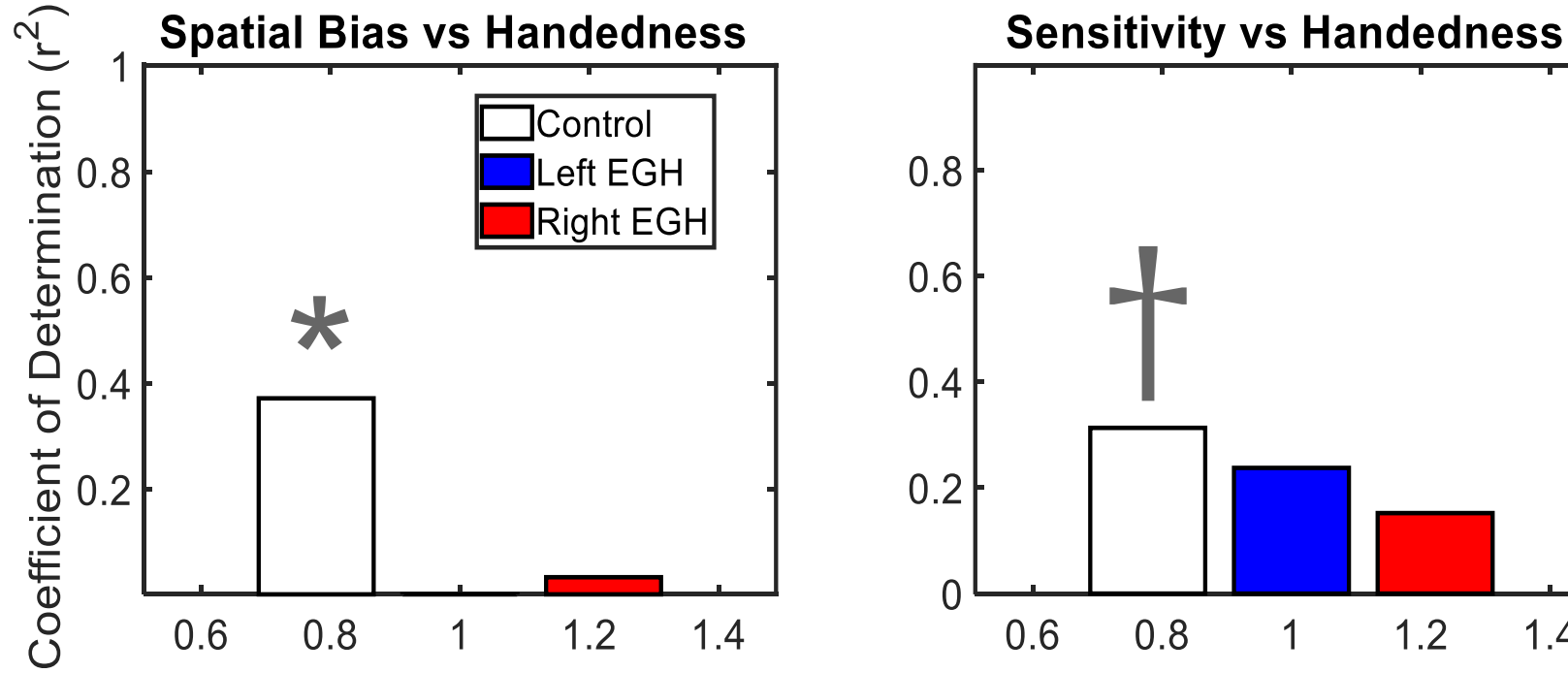
There was a significant difference between left and rightward EGH, suggesting that the visual space changes differently with respect to the side where gaze was held. \* $p < 0.05$ , \*\*\* $p < 0.001$



## Sensitivity



## Handedness and Perceived Space



- There were no differences found between the control and EGH conditions for discrimination sensitivity.
- There was a significant correlation between handedness and spatial bias, but not after EGH. \* $p < 0.05$ ,  $+0.05 \leq p < 0.1$

## Conclusion

Eccentric gaze holding temporarily distorts the perception of space with the fixated side appearing larger. This mechanism may be related to the adaptation of gaze holding which results in rebound nystagmus.

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