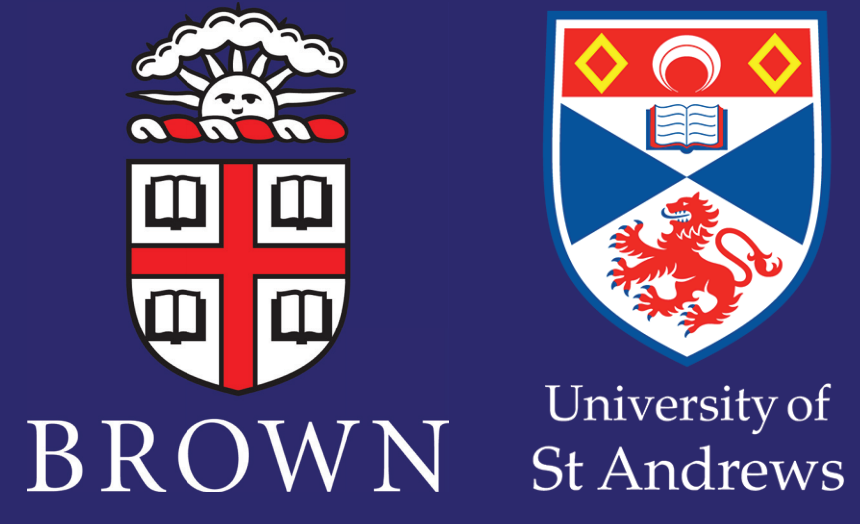
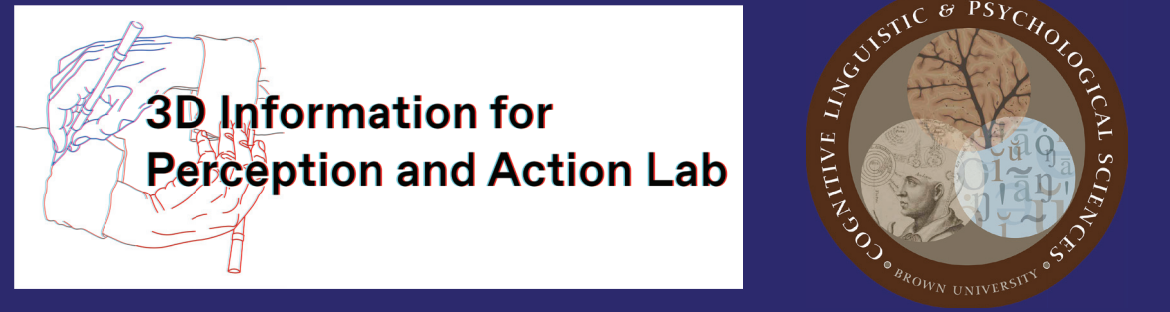


Interplay of exocentric and egocentric information in distance perception for visuomotor tasks

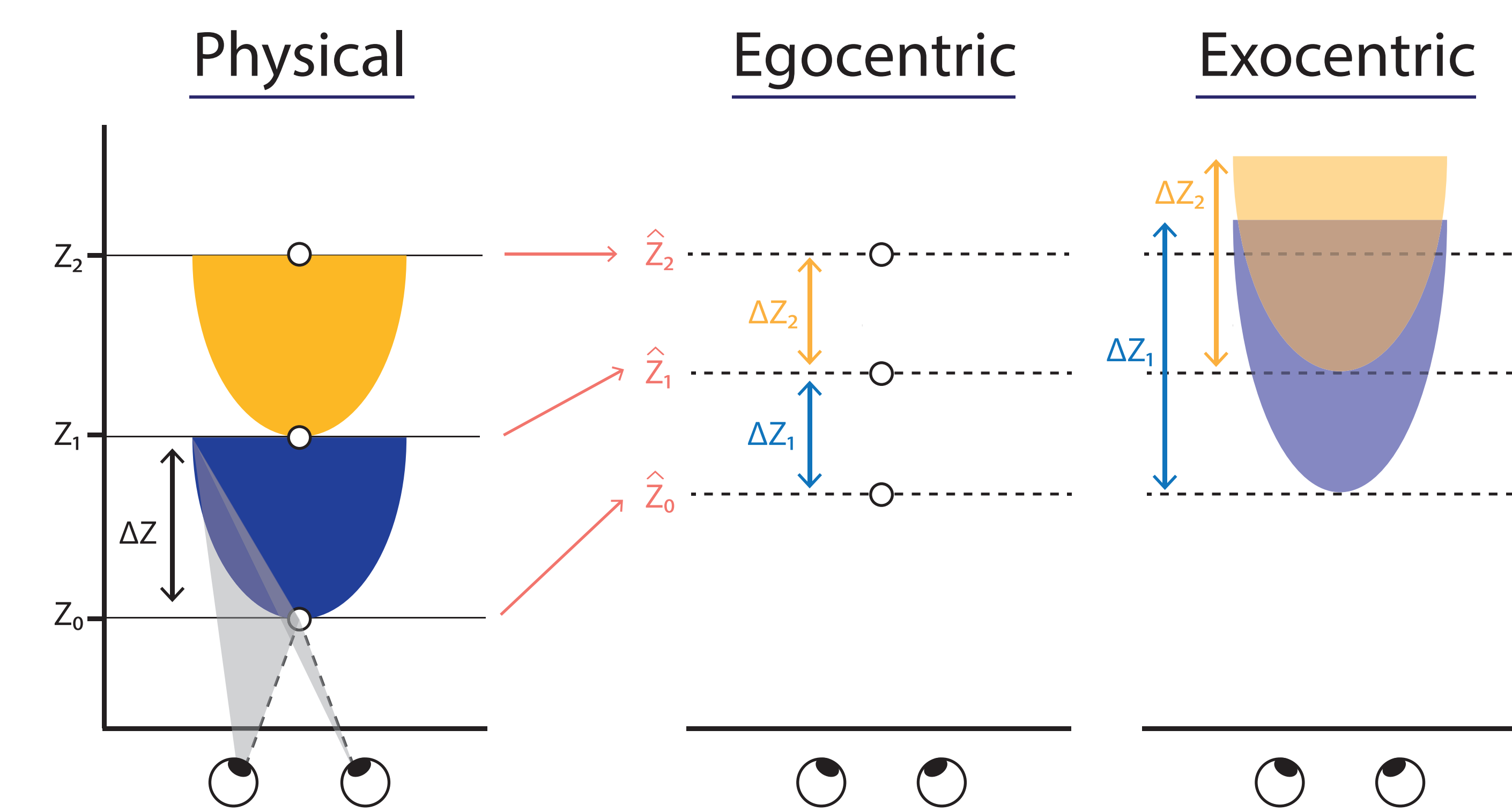


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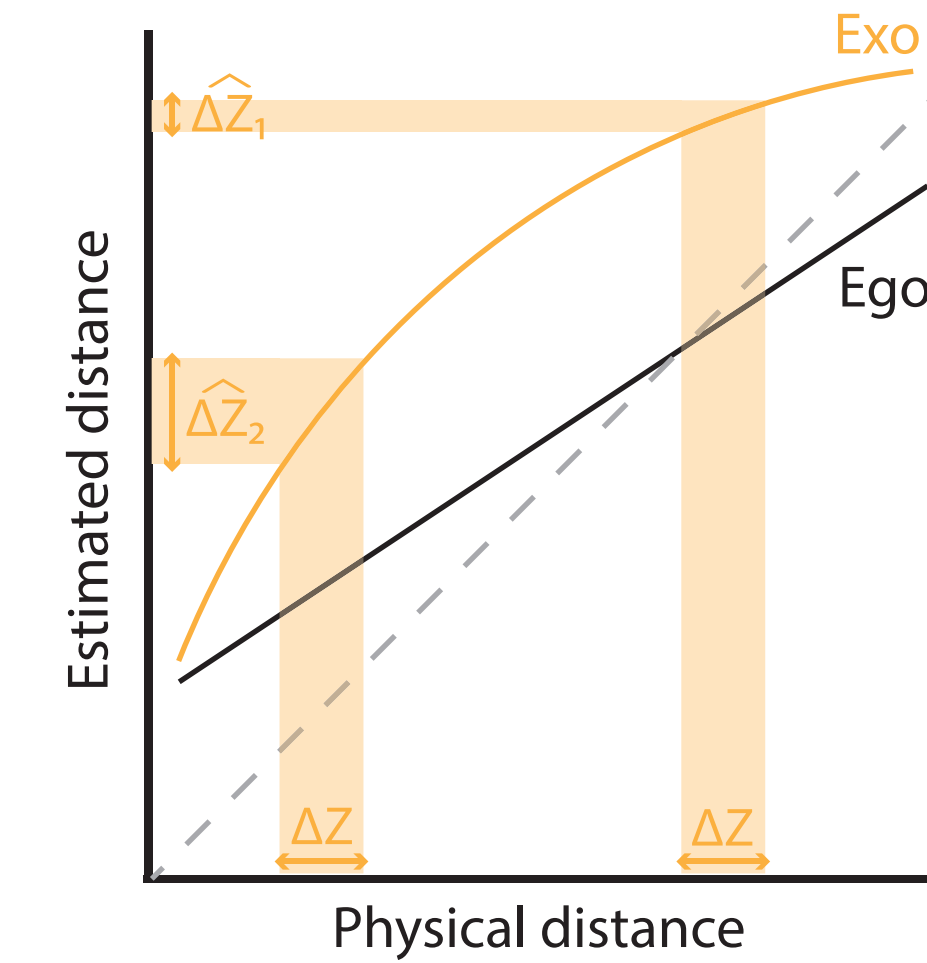
Introduction

Previous studies found distinct biases for egocentric and exocentric estimates of distance along the depth dimension (Campagnoli et al., 2017; Vishwanath, 2023; Warren, 2019)



Inconsistencies between egocentric and exocentric estimates

- Egocentric distance
 - Visuospatial compression ($\Delta Z_1 = \Delta Z_2 < \Delta Z$)
 - But, constant depth interval ($\Delta Z_1 = \Delta Z_2$)
- Exocentric distance (depth)
 - Depth underconstancy ($\Delta Z_1 > \Delta Z_2 > \Delta Z$)



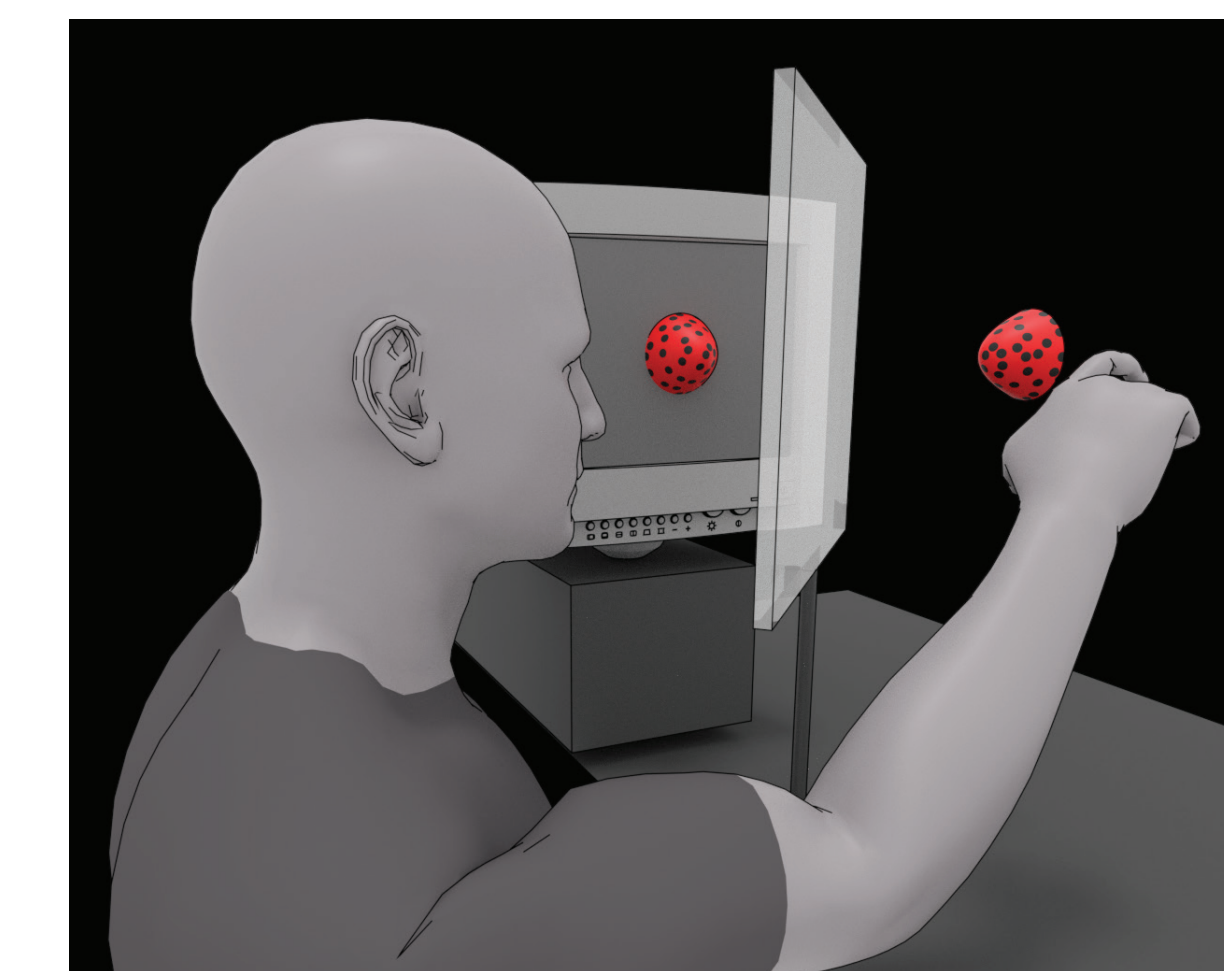
Research Question

If reaching is driven solely by egocentric information and grasping is guided by exocentric information, will there be a dissociation in estimates of the same location depending on the task?

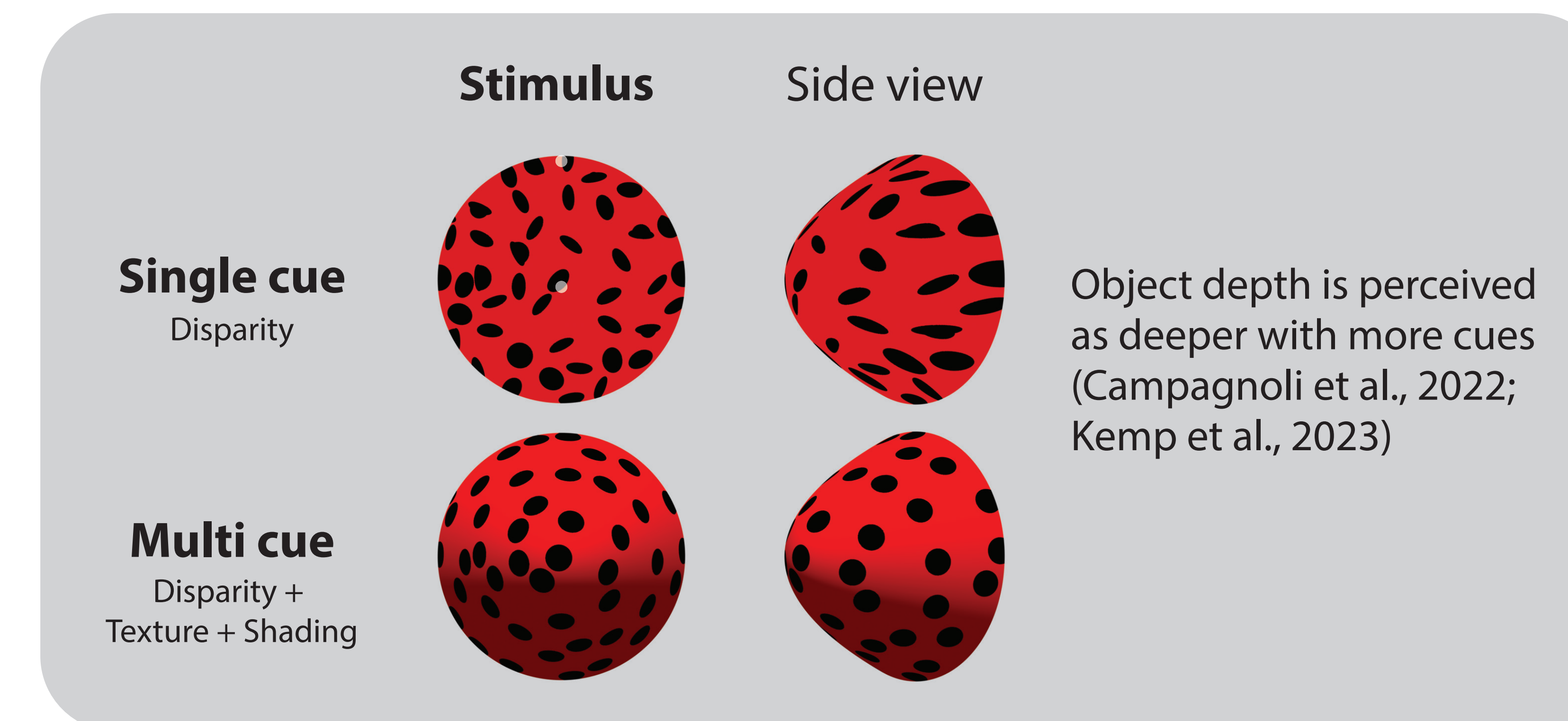
Conclusion

- We found a clear dissociation between egocentric and exocentric estimates for both reaching and grasping.
- Paradoxically, the same physical location was perceived differently based on whether it was part of the front or back of the object due to the visuospatial compression and depth underconstancy.
- This dissociation was intensified by introducing additional depth cues.
- The visual system integrates exocentric and egocentric information for reaching task, even when egocentric information alone is sufficient.

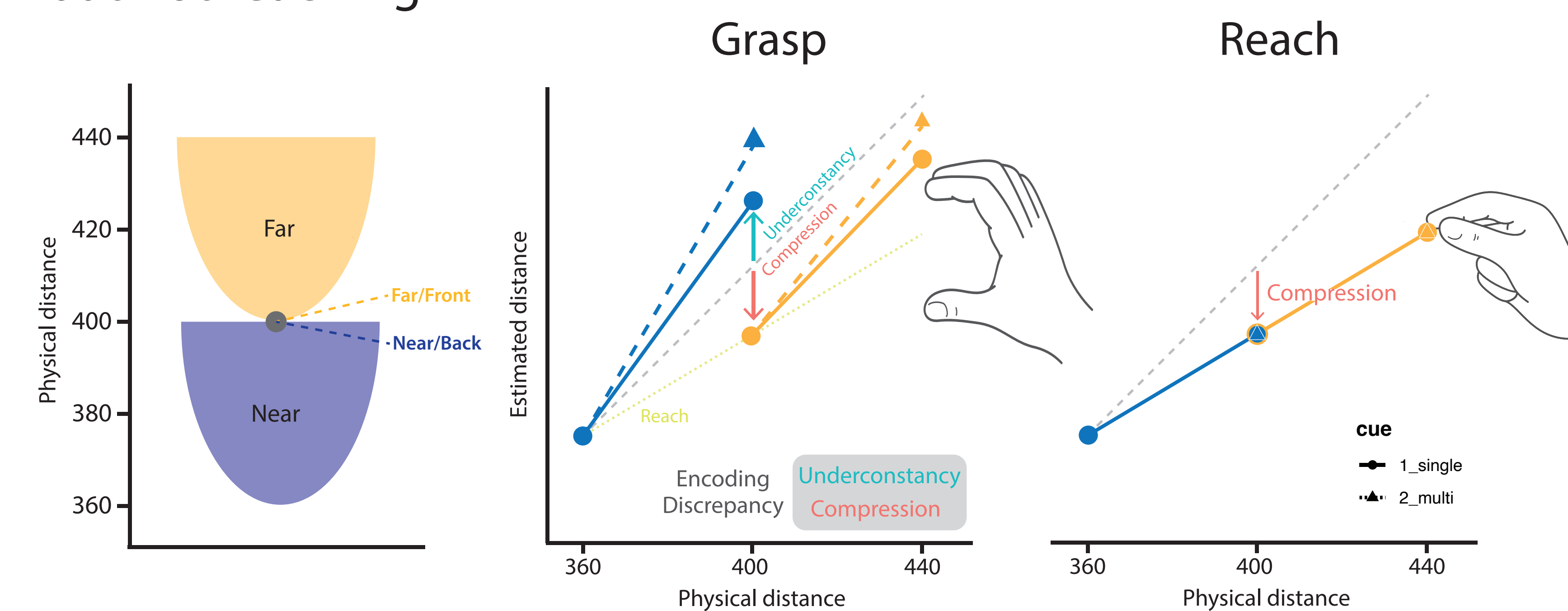
Methods



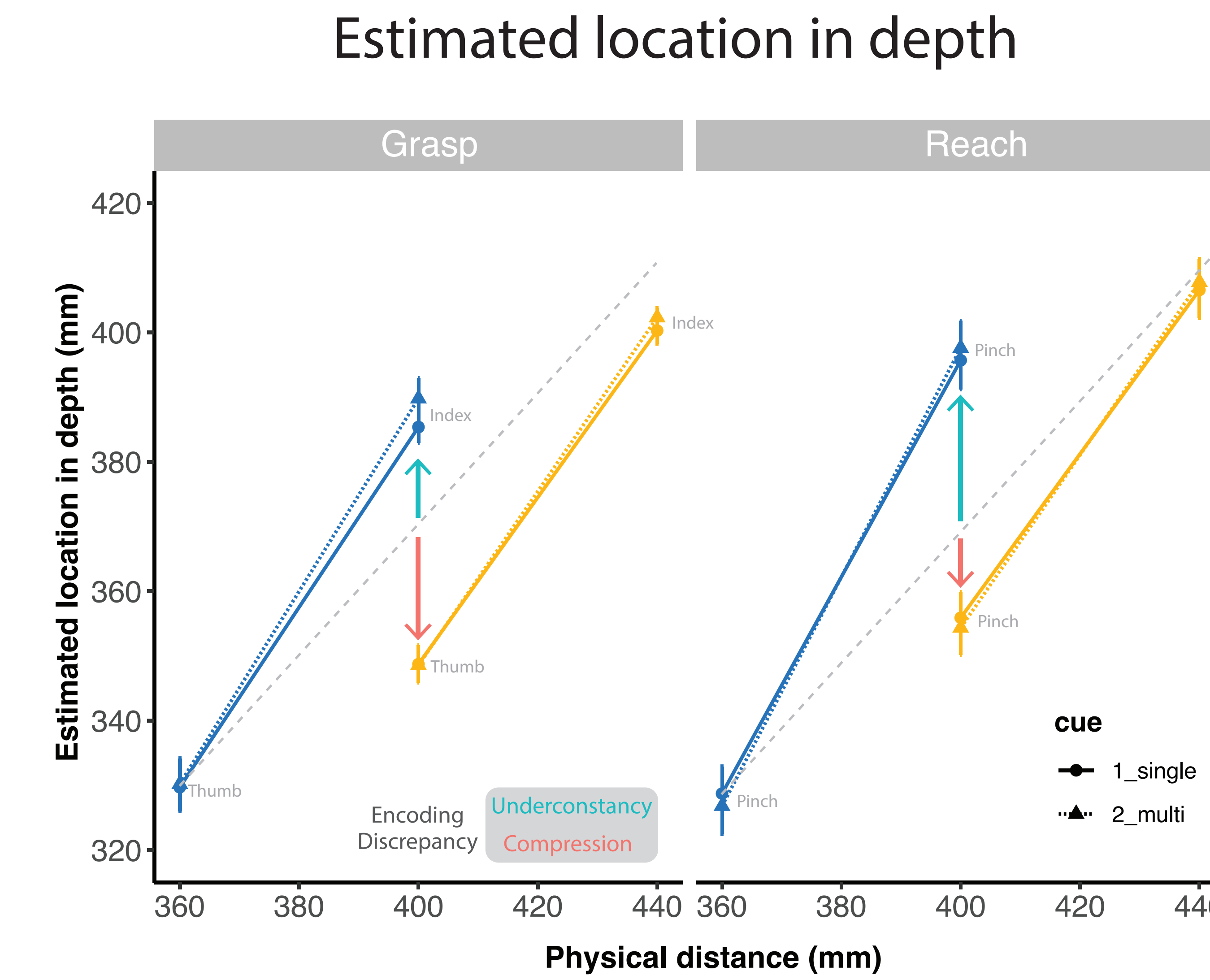
- Compared grasp vs. reach
- Manipulated exocentric information through:
 - Object distance (Depth underconstancy)
 - Number of Cues (Depth overestimation)



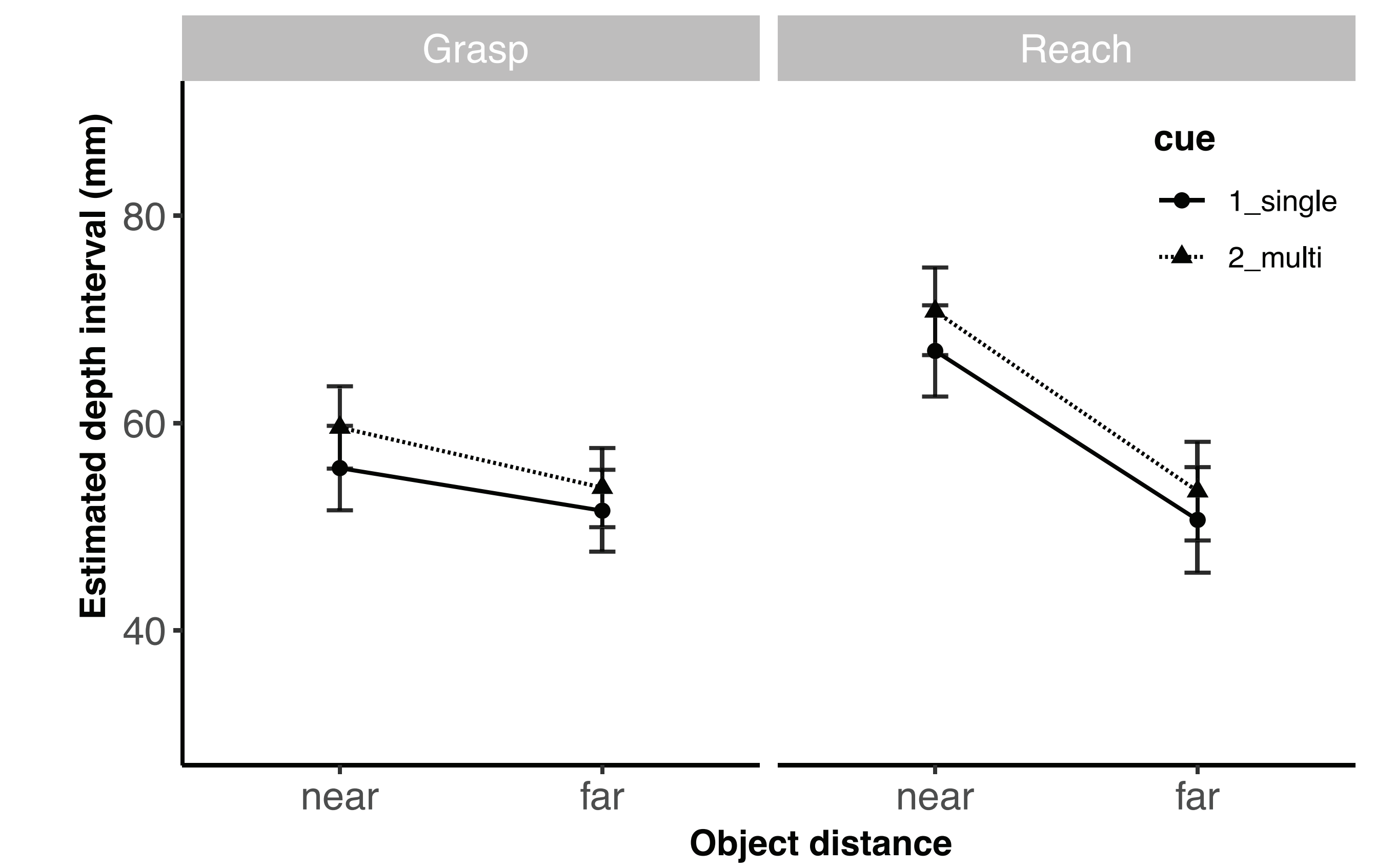
Predicted results if exocentric information affects grasping, but not reaching



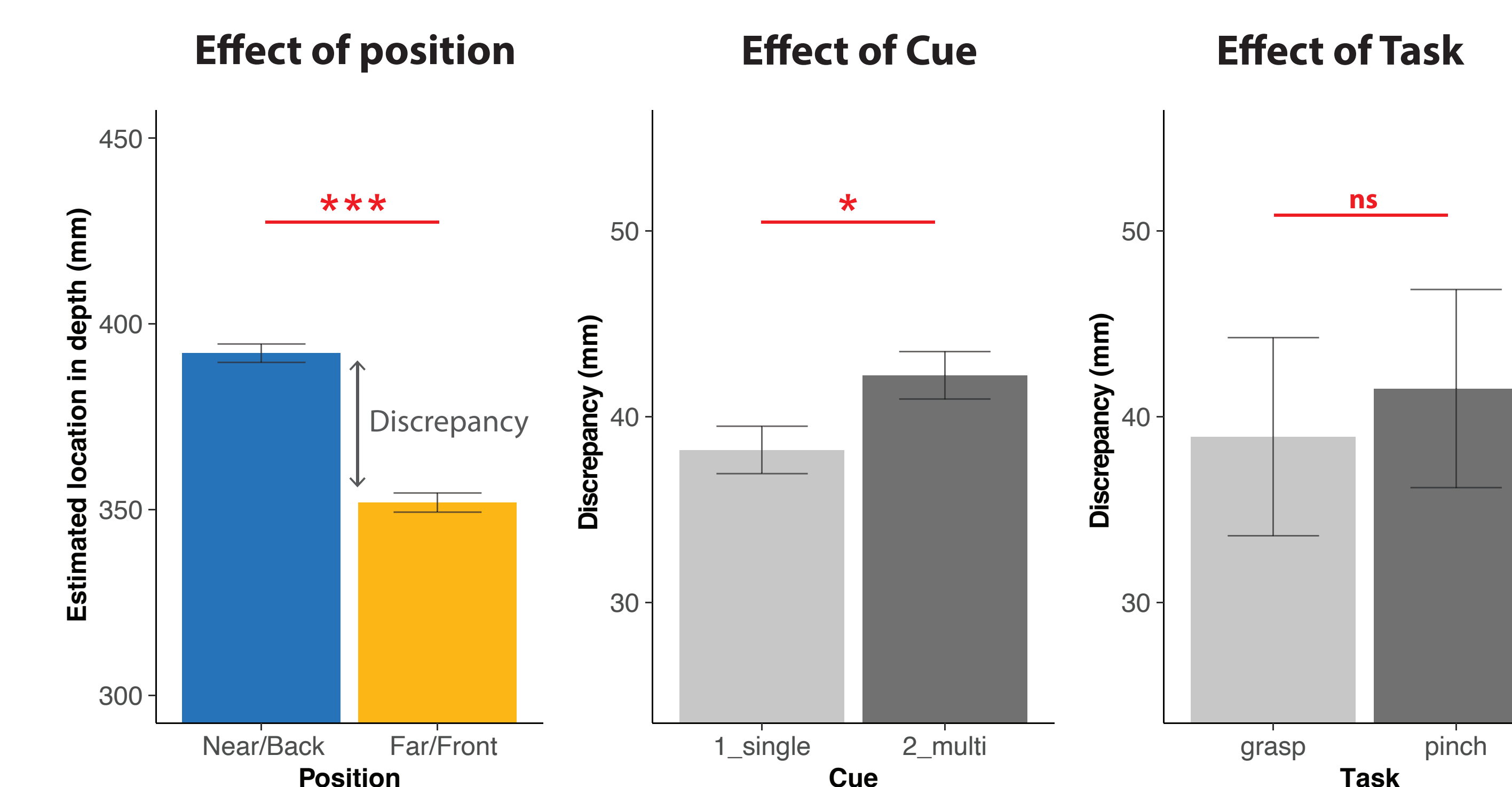
Results



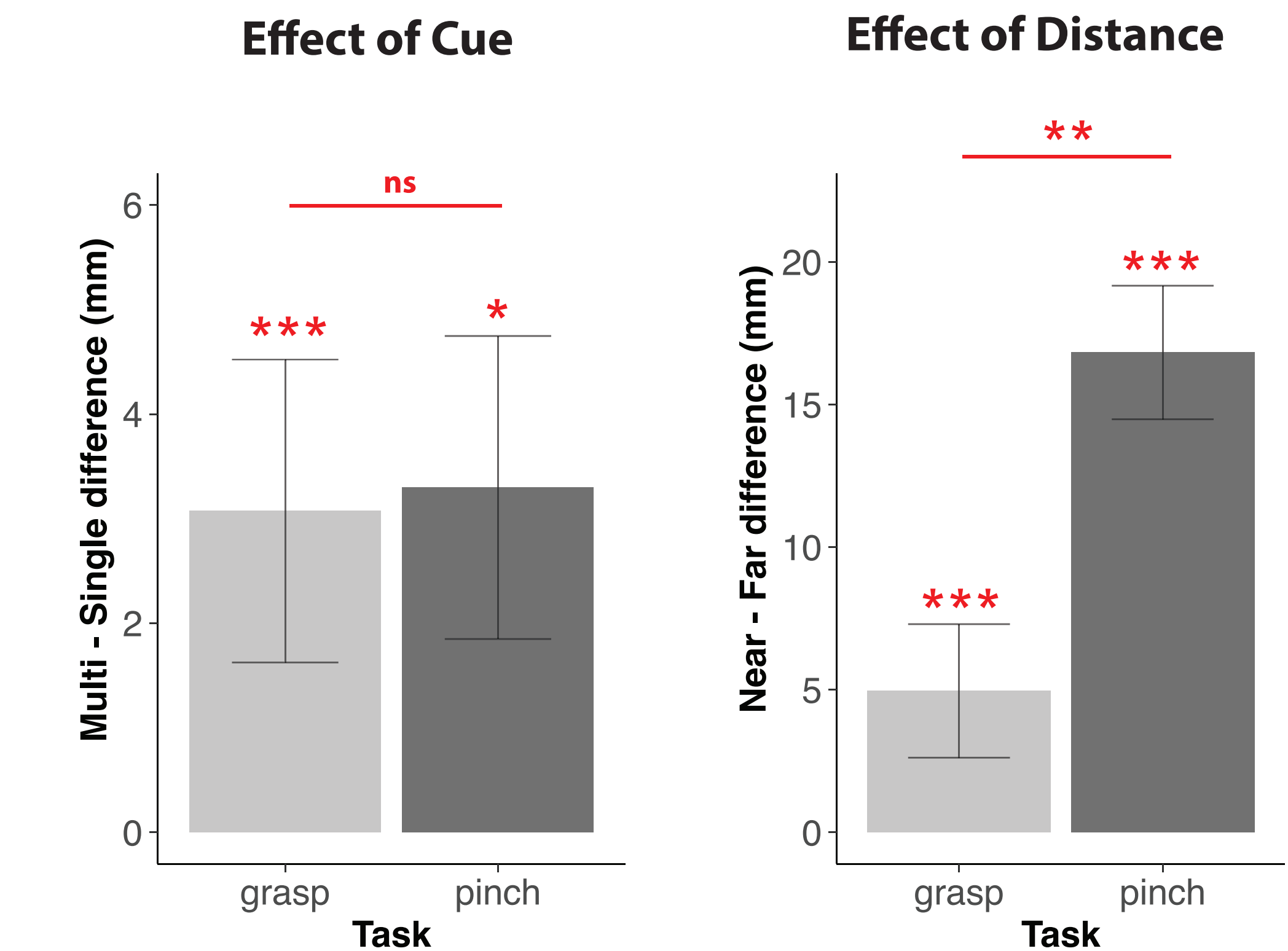
Estimated depth interval (Back - Front)



Encoding Discrepancy (Egocentric vs. Exocentric)



Estimated depth interval difference



References

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