MULTIDIMENSIONAL SPATIAL MEMORY IN BLIND AND SIGHTED PEOPLE

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INTRODUCTION

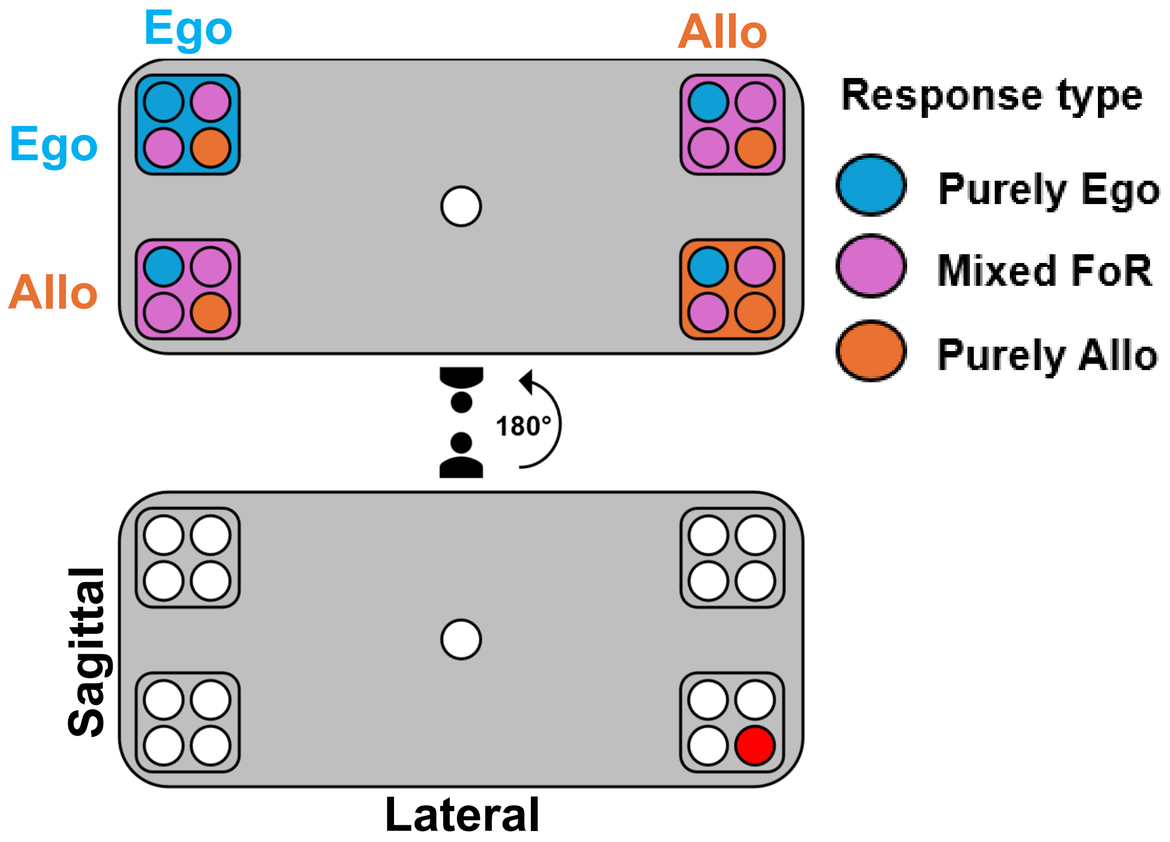
- Humans encode space via **Egocentric** (self-centered) and **Allocentric** (world-centered) Frames of Reference (FoR) that can be flexibly employed on different spatial axes.
- When required to use multiple FoRs **in the same individual action** they tend to prefer Allocentric FoR on the lateral axis and egocentric FoR on the sagittal one (Pitt, 2024).
- **Early blind people** seem to preferentially rely on Egocentric spatial representations (Ruggiero et al., 2009). Yet, most paradigms tend to test just one linear spatial axis, which is hardly how people experience their environment.

1) Are blind people more egocentric than sighted people?

2) Do blind people use different reference frames on different spatial axes, as sighted people do, or are they equally egocentric on any axis?



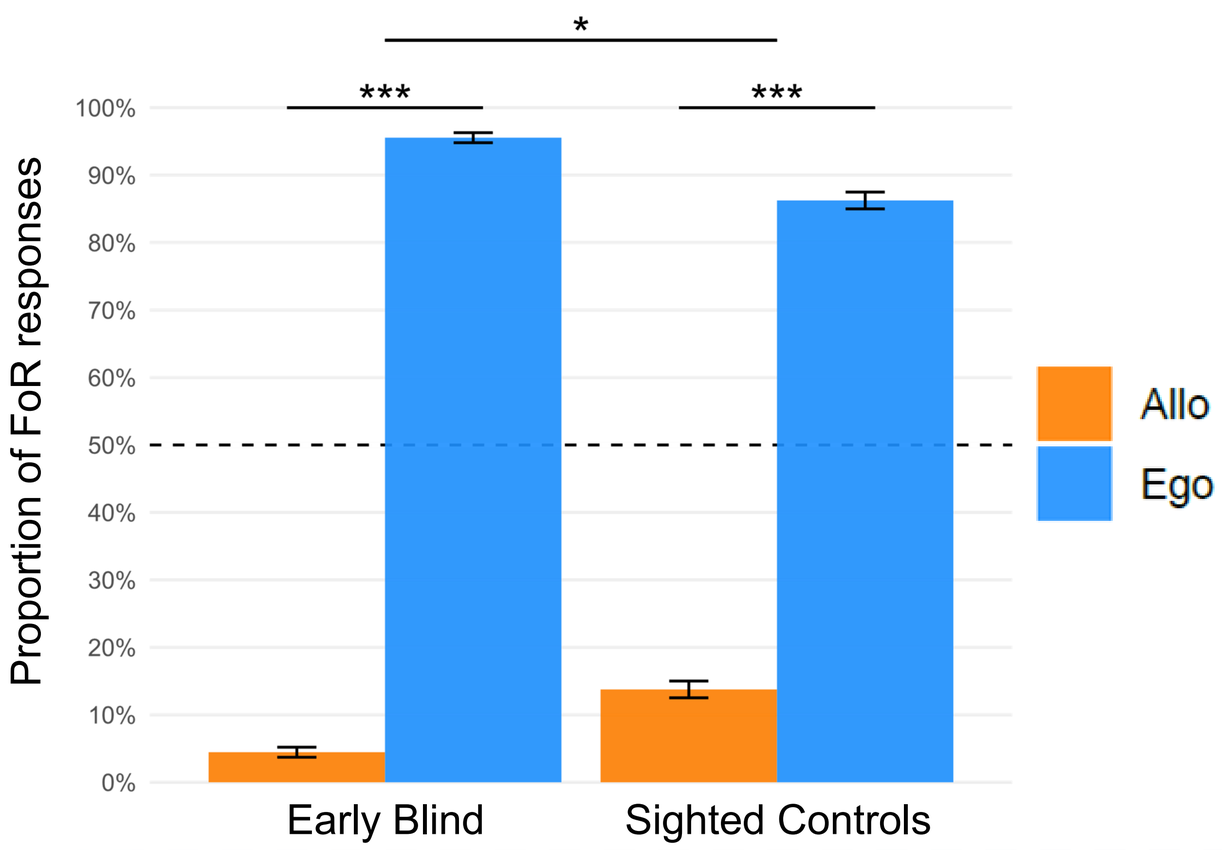
METHODS



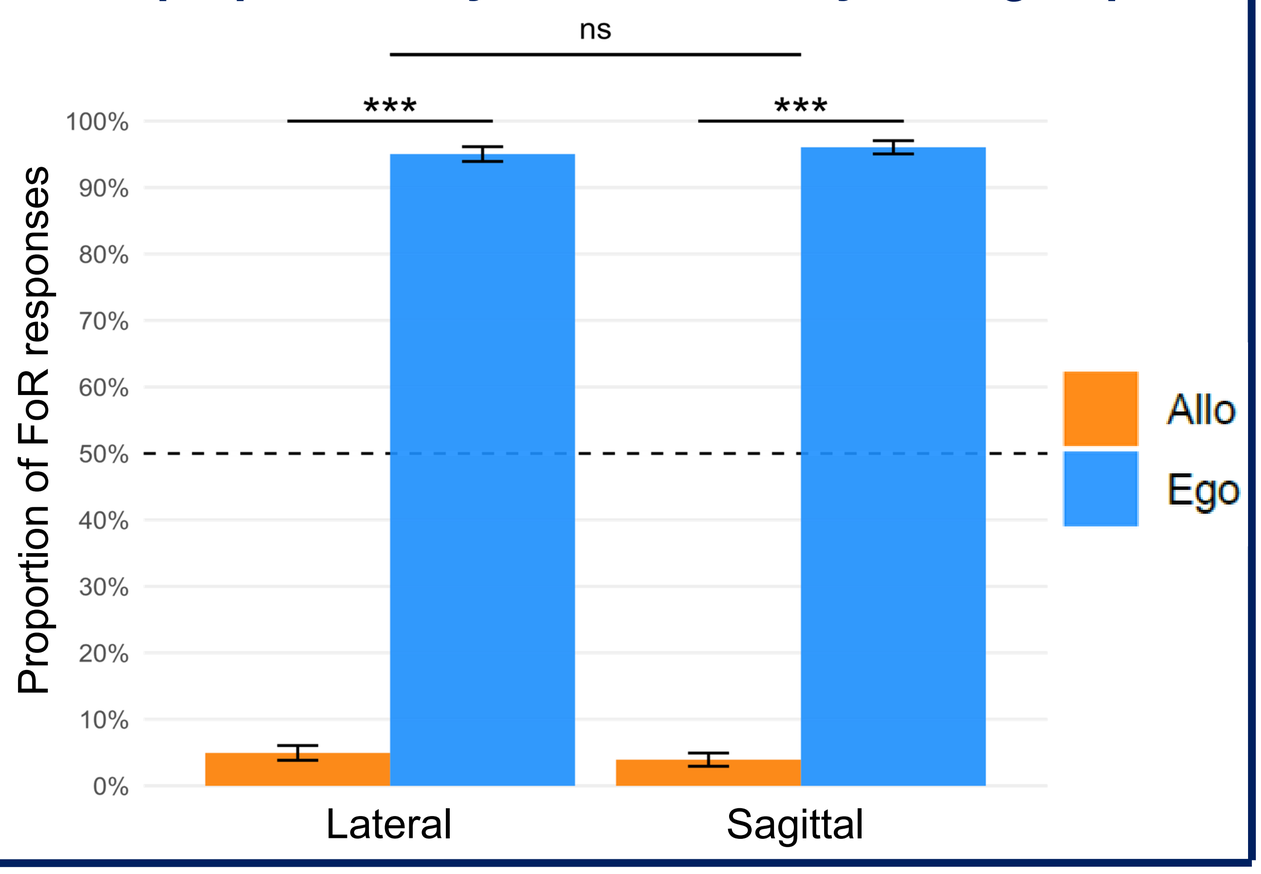
Population: 23 early blind and 23 blindfolded sighted control participants.
Task: spatial memory task.
Generalized linear mixed model: FoR ~ Axis * Group + Level + (1 + Axis * Group | Subject)

RESULTS

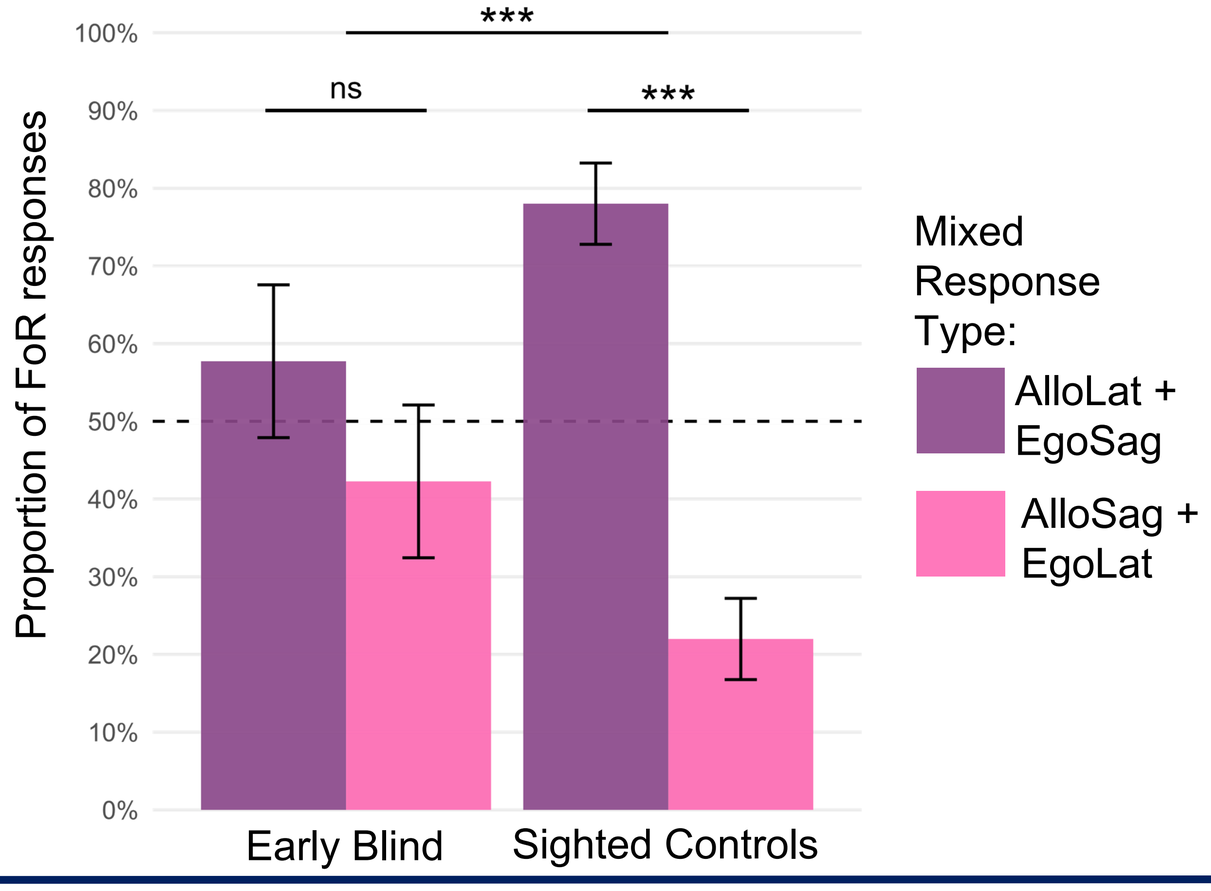
FoR proportions by group.



FoR proportions by axis in the early blind group.



Comparison of different mixed response types within and across groups.



CONCLUSIONS

- Both groups significantly preferred egocentric to allocentric responses, with **early blind** being **more egocentric** than sighted controls.
- Early blind significantly preferred **egocentric** to allocentric responses **on both spatial axes**.
- Sighted controls preferred mixed responses that were Allocentric on the sagittal and Egocentric on the lateral axis, while early blind did not significantly differentiate between the two.

While sighted controls show an effect of axis, in line with previously examined groups (Pitt, 2024), early blind do not exhibit such flexibility, due to their difficulty to switch between different FoRs (Ruggiero et al., 2018).

References:
Pitt B. Proc Ann Meet Cog Sci Soc. (2024) 46:276-82; Ruggiero G et al. Cog Proc. (2009) 10:283-5; Ruggiero G et al. Exp Brain Res. (2018) 236:813-20.