



Portable Psychophysics: Measuring Visual Crowding with the Apple Vision Pro

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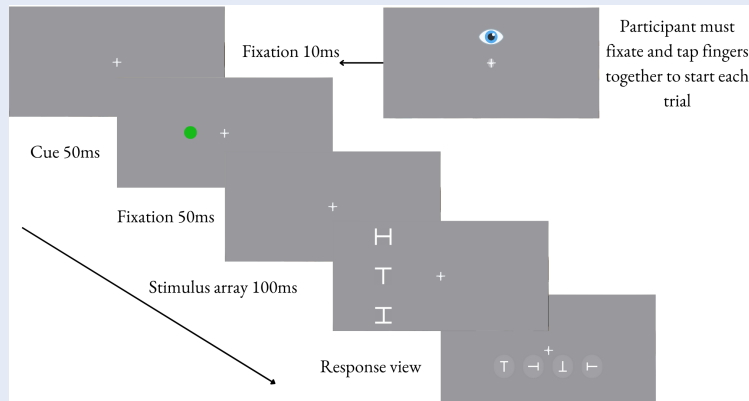
INTRODUCTION

- **Purpose:** Code an app for the Apple Vision Pro that can measure crowding and replicate the finding that covert exogenous spatial attention reduces the critical distance

- Addresses issues of cost and portability
- Allows researchers to reach and test populations that were previously unreachable
- Leverages eye tracking capabilities of Apple Vision Pro as eye tracking is integral to testing many psychophysics phenomena



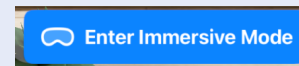
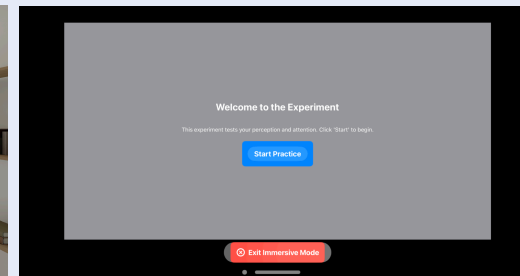
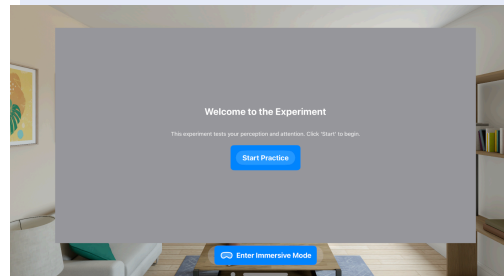
METHODS & TOOLS



- App/experiment was developed Xcode using Swift
- Analysis script was written in Python using Google Colab

APP

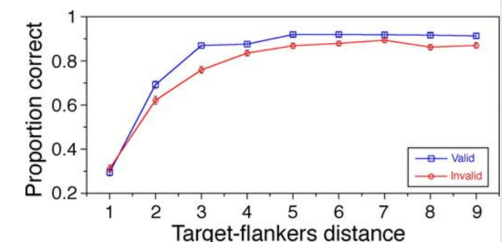
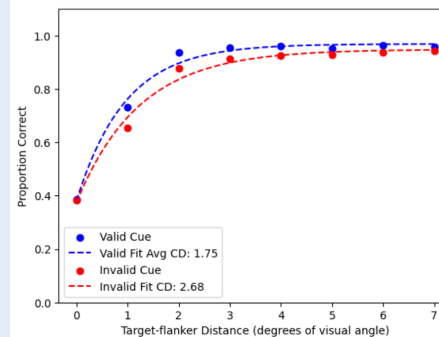
Immersive Mode



CONCLUSION

Our Data vs Original Paper³

Proportion Correct vs. Target-flanker Distance (N=14)



- We were able to successfully measure visual crowding and replicate previous work on the impact of exogenous cueing using the Apple Vision Pro.
- Future possibility of using cheap, portable, and immersive VR systems for visual psychophysics

– Learn more about Psych part from poster in LSC

1. Carrasco M. (2011). Visual attention: the past 25 years. *Vision research*, 51(13), 1484–1525. <https://doi.org/10.1016/j.visres.2011.04.012>
 2. Whitney, D., & Levi, D. M. (2011). Visual crowding: a fundamental limit on conscious perception and object recognition. *Trends in cognitive sciences*, 15(4), 160–168. <https://doi.org/10.1016/j.tics.2011.02.005>
 3. Yeshurun, Y., & Rashal, E. (2010). Precueing attention to the target location diminishes crowding and reduces the critical distance. *Journal of vision*, 10(10), 16. <https://doi.org/10.1167/10.10.16>