

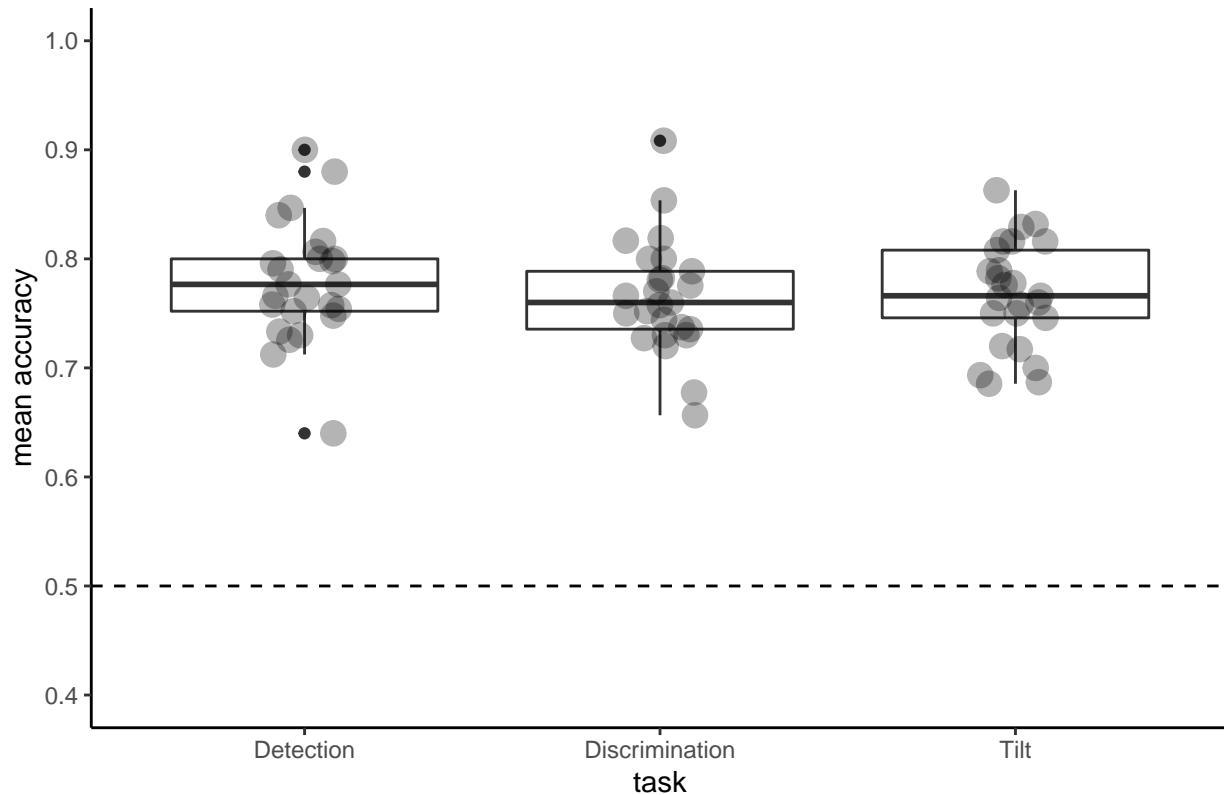
Behavioural Analysis

Chudi Gong

29/05/2020

1. Performance across different tasks.

Fig.1 Mean accuracy



Mean performance for each task

Performance across the three tasks, detection (accuracy = 0.78, $d' = 1.80$), discrimination (accuracy = 0.77, $d' = 1.54$) and tilt recognition (accuracy = 0.77, $d' = 1.96$) was similar. An one-way ANOVA failed to detect a significant difference between the accuracy of these three tasks ($F = 0.47$, $p = 0.63$,) and d' ($F = 3.20$, $p = 0.05$).

The probability of responding YES in detection was $0.46 (\pm 0.07)$, and was significantly different from 0.5 (ADD T TEST RESULTS). The probability of responding CLOCKWISE was $0.51 (\pm 0.11)$ and was not significantly different from 0.5. For the tilt recognition task, the probability of responding TILTED was (0.43 ± 0.07) .

Response time was faster for correct response (1st quartile = 866.66, median = 916.63, 3rd quartile = 951.57 milliseconds) than incorrect responses (1st quartile = 925.50, median = 1000.10, 3rd quartile = 1075.16 milliseconds). A one-way analysis of variance failed to detect a significant overall effect of responses type in

detection (YES vs. NO, $t=0.44$ $p=0.66$), discrimination (CLOCKWISE vs. ANTICLOCKWISE, $t=0.82$, $p=0.41$) and tilt recognition (VERTICAL vs. TILTED, $t=-1.69$, $p=0.09$).

2. Confidence distributions

Fig.2 Detection

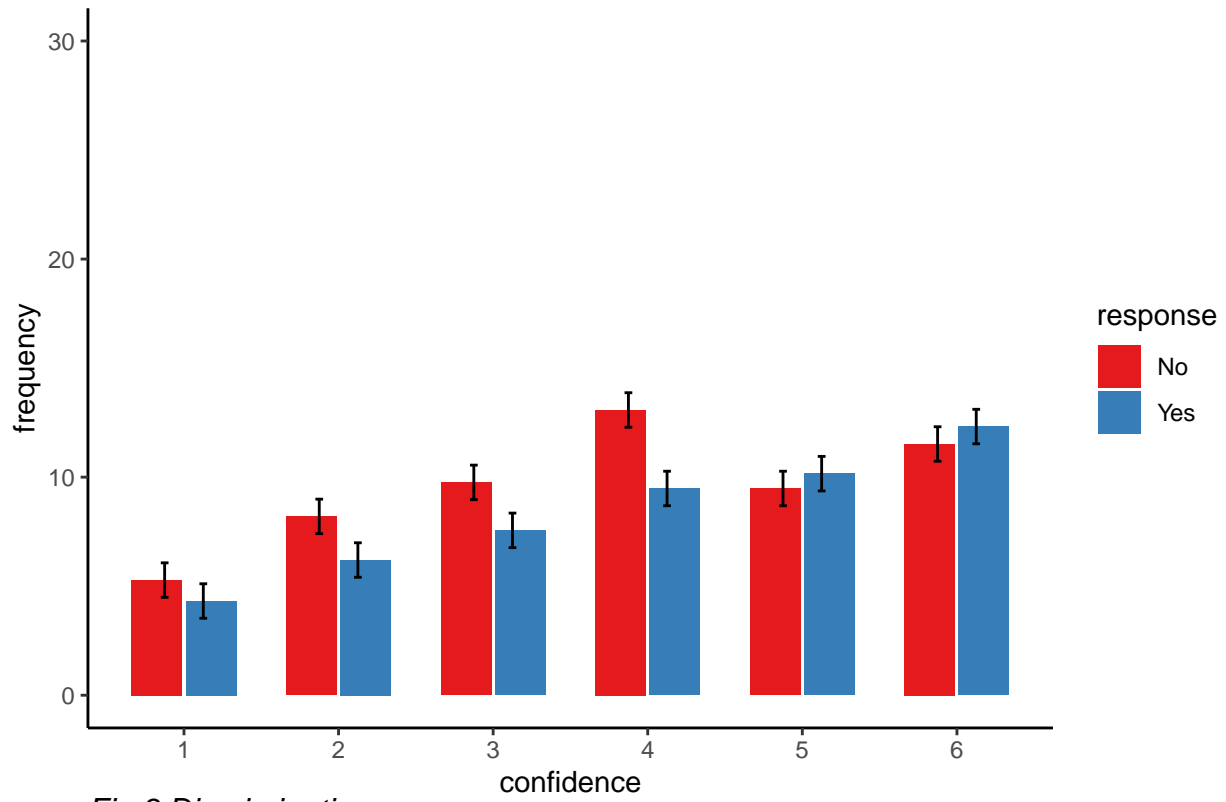


Fig.3 Discrimination

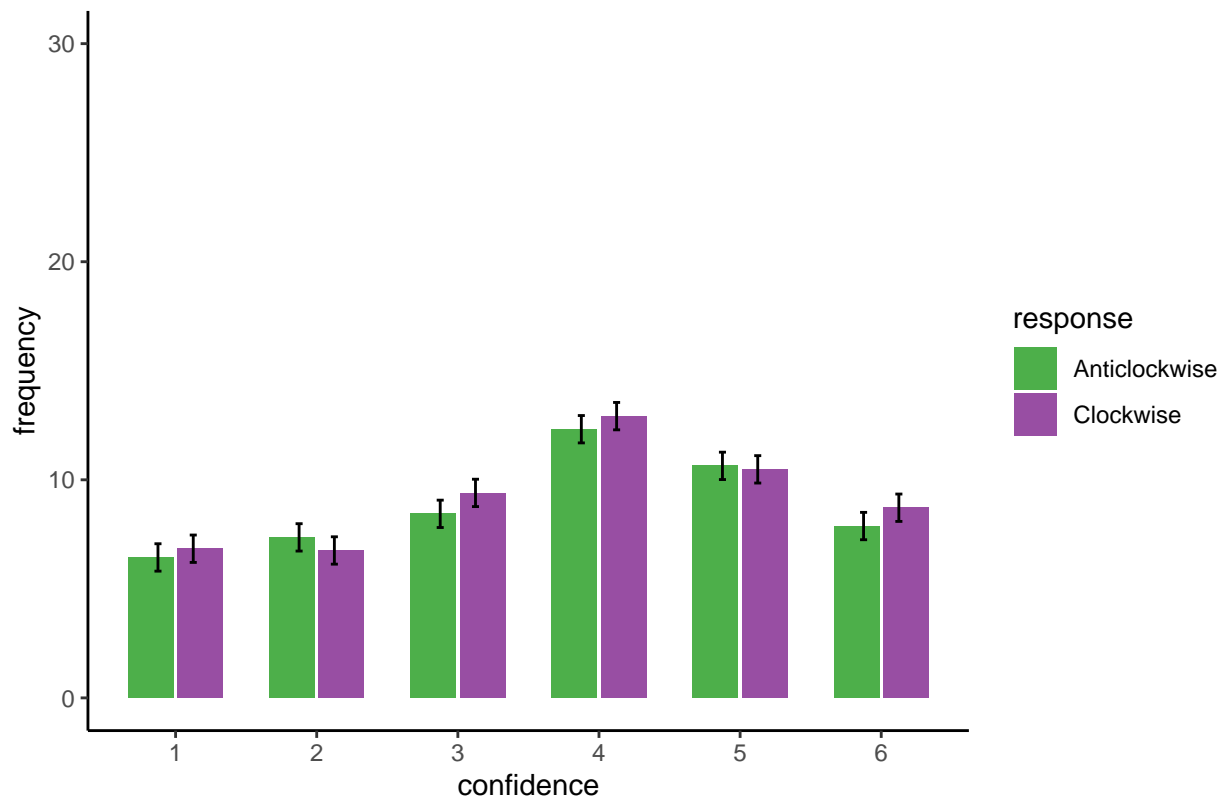
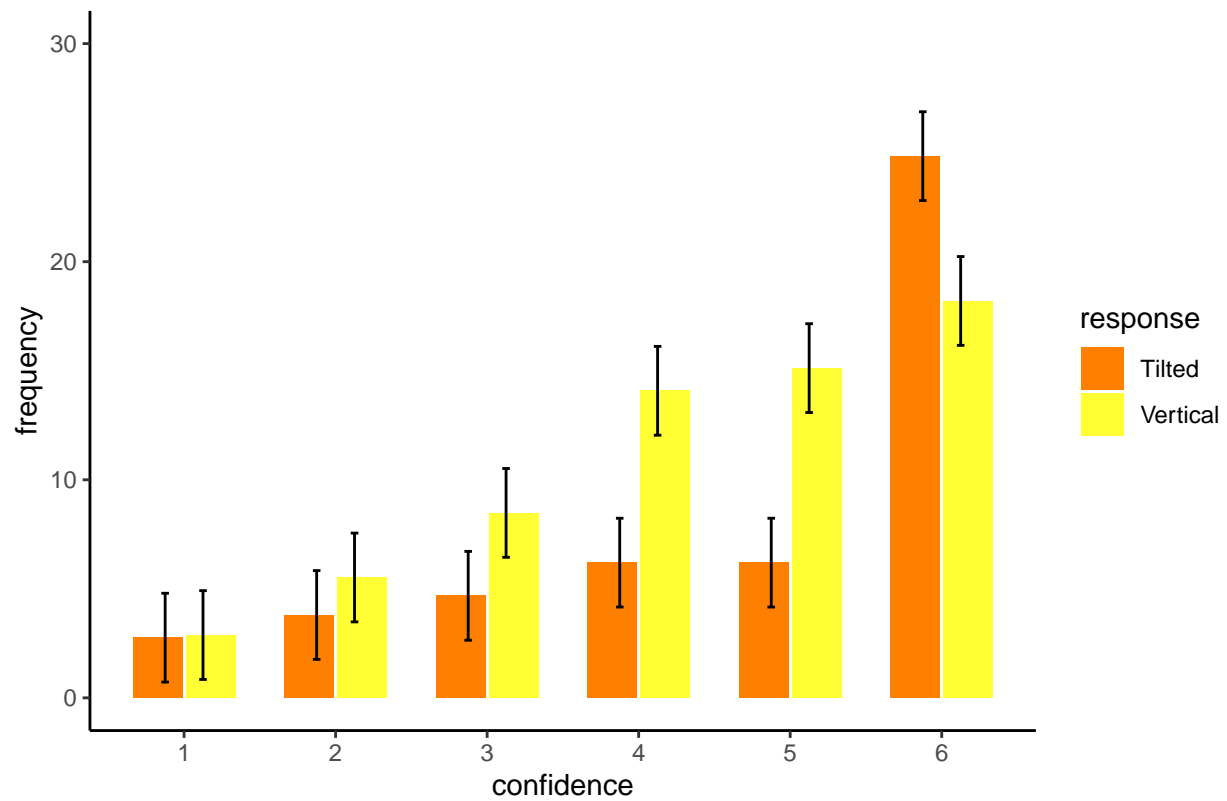


Fig.4 Tilt recognition



Within detection, a significant difference in mean confidence was observed between YES (target present) and NO (target absent) responses (see Fig.4 above), such that participants are more confident in their YES responses ($t=-3.27$, $p = 0.00$) and a statistical significance was also observed in the tilt recognition task between TILTED and Vertical response ($t=-6.23$, $p = 0.00$).

3.Type 1 ROC curves

Fig.5 Type 1 ROC Detection

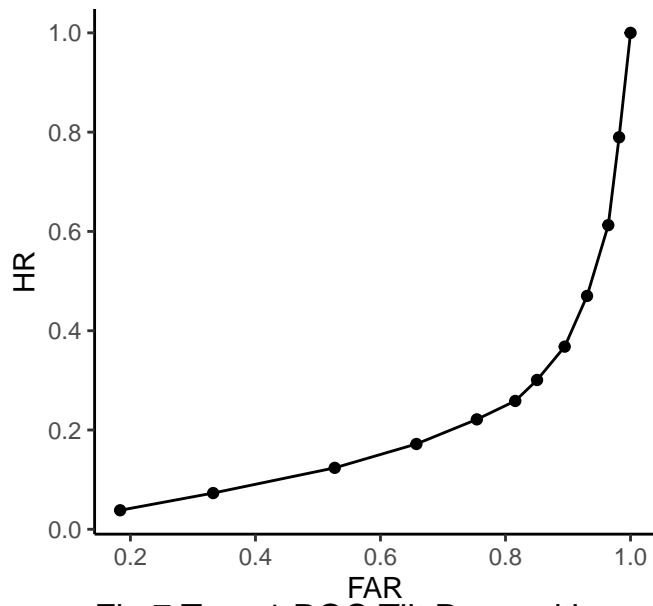


Fig.6 Type 1 ROC Discrimination

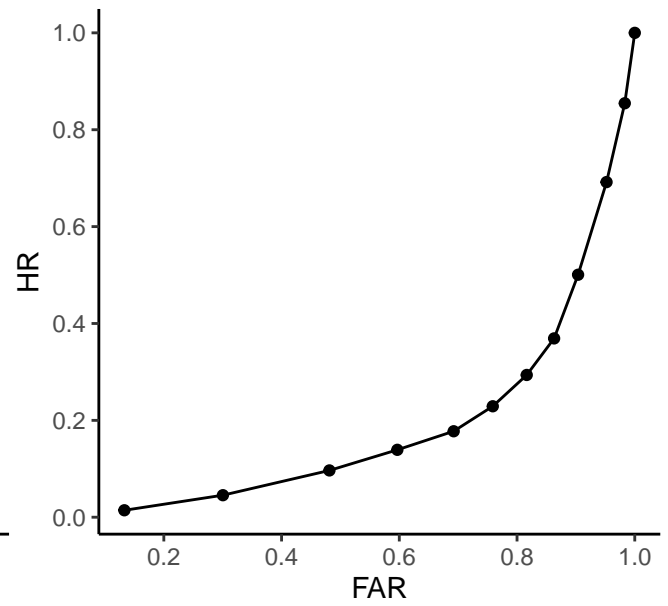
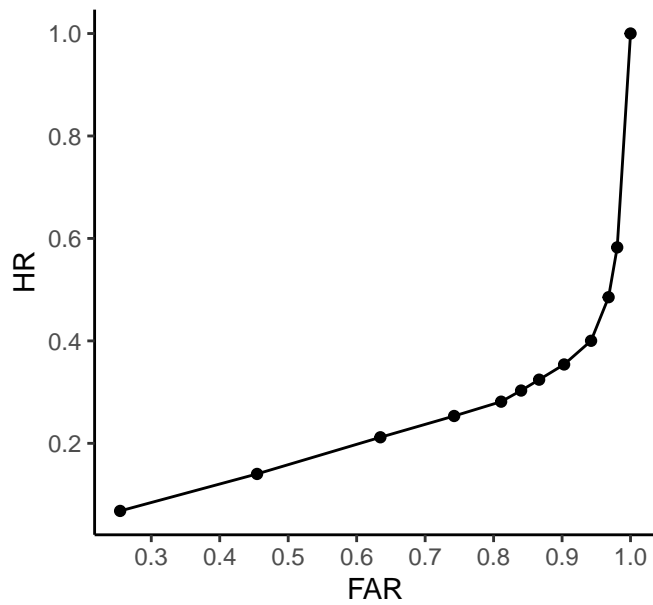


Fig.7 Type 1 ROC Tilt Recognition



4.Type 2 ROC curves

Fig.8 Type 2 ROC Detection

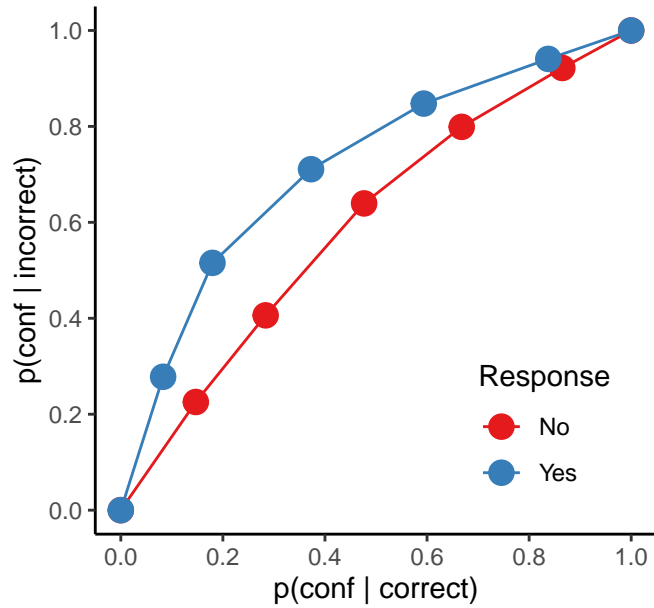


Fig.9 Type 2 ROC Discrimination

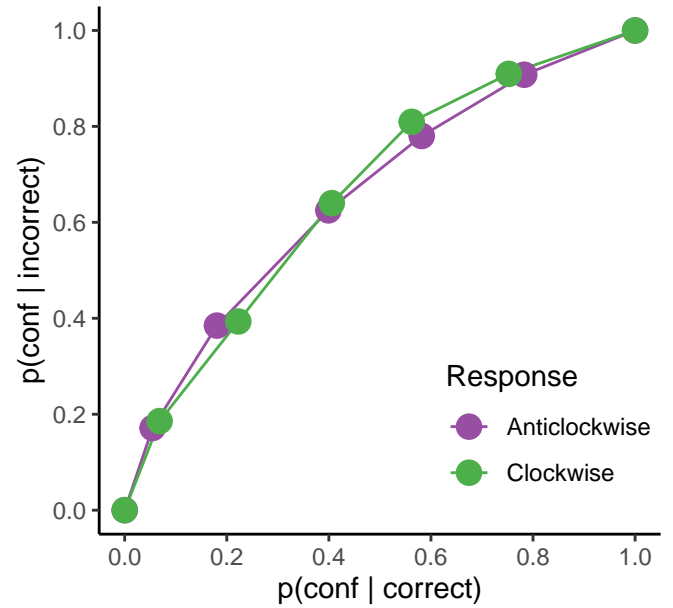
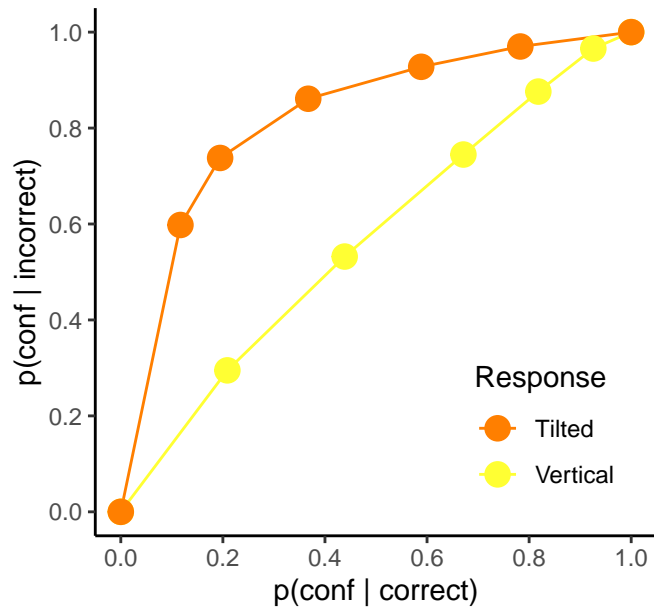


Fig.10 Type 2 ROC Tilt



Citation

(Denison et al. 2018)(Mazor, Friston, and Fleming 2020)

Reference

Denison, Rachel N., William T. Adler, Marisa Carrasco, and Wei Ji Ma. 2018. “Humans Incorporate Attention-Dependent Uncertainty into Perceptual Decisions and Confidence.” *Proceedings of the National Academy of Sciences of the United States of America* 115 (43): 11090–5. <https://doi.org/10.1073/pnas.1717720115>.

Mazor, Matan, Karl J Friston, and Stephen M Fleming. 2020. “Distinct Neural Contributions to Metacognition for Detecting, but Not Discriminating Visual Stimuli.” Edited by Thorsten Kahnt, Joshua I Gold, and Michael Graziano. *eLife* 9 (April). eLife Sciences Publications, Ltd: e53900. <https://doi.org/10.7554/eLife.53900>.