Summary Statistics for Gaze and Head Direction over Time

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Abstract

INTRODUCTION: Average properties of facial identity or emotion can be extracted over both space and time (e.g. Haberman & Whitney, 2009). We have previously shown that average head rotation is more efficiently encoded than gaze deviation over space (Florey et al VSS 2015). Here, using a temporal averaging paradigm to approximate natural viewing behaviour, we examine whether this superiority for head averaging persists and whether judgments of gaze and head direction are prone to recency effects. METHODS: Each trial consisted of a sequence of 8 faces, whose head rotation or gaze deviation were drawn from a normal distribution (sd =16°) with a mean that varied from trial to trial. At the end of each trial (240 per condition), participants (n=19) indicated their perceived mean gaze deviation (head rotation) of the set using an on screen pointer. RESULTS: The standard deviation of participants' responses from the true mean was used as a measure of accuracy. Regression coefficients for each face in the sequence were calculated using a linear regression model. No significant difference was found in participants' accuracy between judging average gaze (mean = 15.8°) or head directions (mean = 14.1°). The regression coefficients indicated all items were being used in participants' estimated average and showed a significant recency (p < .01) effect for the gaze deviation task across all participants but surprisingly not for head rotation. CONCLUSIONS: Observers can average both head rotation and gaze deviation over time, with only gaze deviation judgements showing recency effects. Surprisingly, accuracy of response does not depend on the strategy used (e.g. recency) to perform the task suggesting that other factors such as working memory and internal noise may play a greater role in temporal averaging.

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