

INTRODUCTION

Vision is riddled with ambiguities. Our visual system has made up its mind about most of them, but some remain ambiguous to some degree and allow us to study the processes that help us resolve them.

Depth ambiguity

Biological motion point-light displays and stick-figures are ambiguous with respect to their depth and afford two different interpretations -- both of them being consistent with the familiar shape of a human body. However this consistency requires the reversal in perceived depth to be accompanied by switches in other properties:

- Handedness: left side ↔ right side
- Vertical viewpoint: view from above ↔ view from below
- Horizontal viewpoint: ccw spin ↔ cw spin

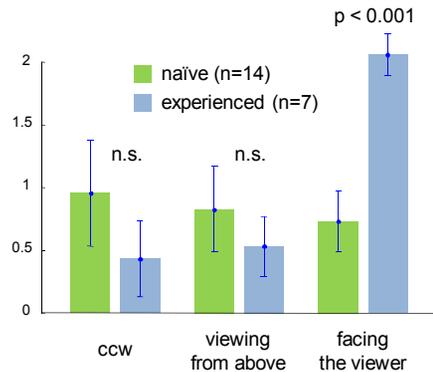
Facing bias and other biases

At least for short presentations, a number of biases are observed:

- ccw rotation (Troje, 2010)
- viewing from above (Troje & McAdam 2010)
- facing the viewer (Vanrie et al. 2004)

VSS 2010

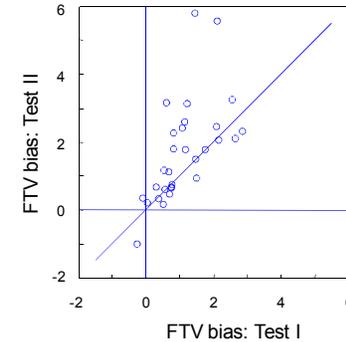
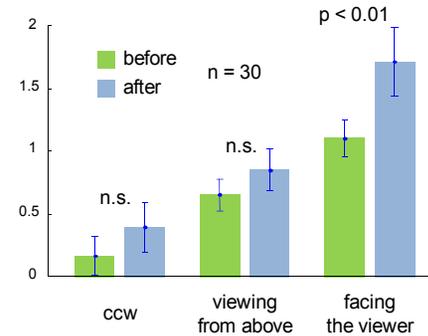
We found the facing bias to much stronger in members of the lab as compared to naïve observers:



Question

Does this "familiarity effect" survive in a controlled experiment? Does extensive exposure to depth-ambiguous point-light walkers result in sharpening the prior? Does the experience of seeing a walker more often as facing the viewer bias the observer to see it even more often facing the viewer?

RESULTS & DISCUSSION



FTV bias after familiarization is not quite as high as in our expert group, but has increased significantly ($p < 0.01$)

How can we explain the increase in facing bias with experience?

- Is it possible that an initially moderate bias enhances itself in the absence of any validity check?
- What should we call this phenomenon? Bootstrapping a prior? Self validation? Run-away validation.
- Can anybody point me to similar phenomena?

METHODS

Stimuli

- Biological motion stick figures



General Design

- 30 participants, 1st year students, no exposure to BM
- Test session I in November, test session II in February
- 8 familiarization sessions between the two tests, one per week

Test session

- Task: *Is the walker rotating CW or CCW?*
- Presentation time: 0.5 s
- Rotation speed: 45 deg/s
- Camera azimuth: 0, 30, ... 330
- Camera elevation: -30, -20, -10, 0, 10, 20, 30
- Total number of trials: 336 stick figures, 84 cubes

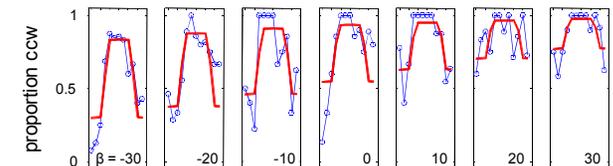
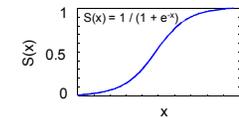
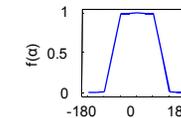
Familiarization session

- 20-30 min to go through seven short tasks, three of which contained BM point light displays, and three contained stick figures
- coherence, detection, distortion, direction, action, gender, identity
- done at home, administered through the internet.

Analysis of test session data

$$r(\alpha, \beta) = S[a + b\beta + c f(\alpha)]$$

- r: rate of ccw responses
- a: ccw bias
- α: horizontal viewpoint
- b: viewing-from-above bias
- β: camera elevation
- c: facing-the-viewer bias



REFERENCES

- Vanrie, J., Dekeyser, M., Verfaillie, K. (2004) Bistability and biasing effects in the perception of ambiguous point-light walkers. *Perception* 33:547 – 560
- Troje, N. F. (2010) Perceptual biases in biological motion perception and other depth-ambiguous stimuli. *Journal of Vision*, 10(7), 792
- Troje, N. F., McAdam, M. (2010) The viewing-from-above bias and the silhouette illusion. *i-Perception* 1:143-148.