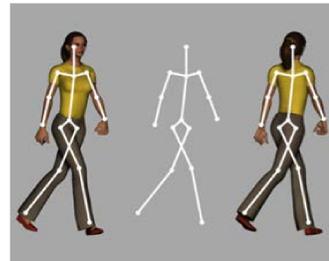


Physical exercise reduces the facing-the-viewer bias for biological motion stimuli

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Introduction

- Some have argued that the facing-the-viewer bias exists for sociobiological reasons.¹
- In support of this, more anxious individuals have greater facing-the-viewer biases.²
- One method of reducing anxiety is by engaging in physical exercise.³



Purpose: To measure facing-the-viewer biases after participants engaged in physical exercise.

Hypotheses: We hypothesized that facing-the-viewer biases would be weaker following exercise compared to controls.

Methods

Design: Participants were randomly assigned to one of the three between-subject conditions in a 3 x 3 mixed design.

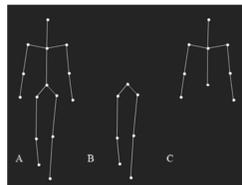
Between-Subjects Factor: Exercise

- Standing (Control) – 0 km/h
- Walking – 4 km/h
- Jogging – 8 km/h



Within-Subjects Factor: Stimulus Type

- Full stick figure walker (A)
- Bottom-half-only (B)
- Top-half-only (C)



Questionnaires:

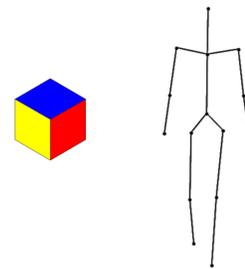
- State-Trait Anxiety Inventory (STAI)
- Social Interaction Anxiety Scale (SIAS)

Physiological Measures:

- Heart Rate (bpm)

Methods - Continued

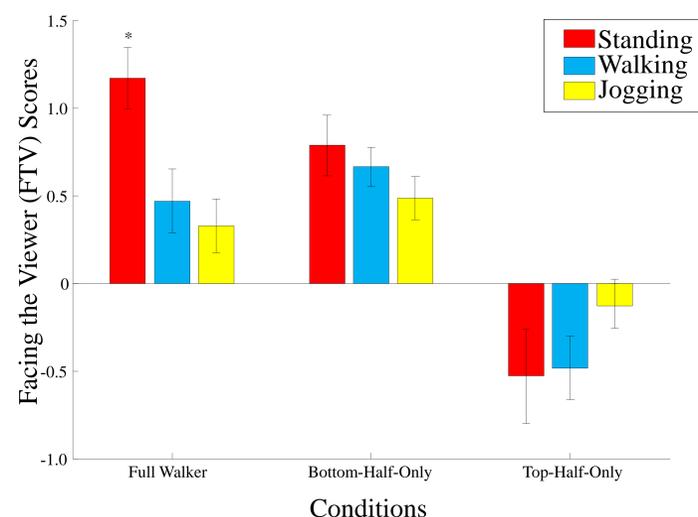
Perceptual Task: All stick-figure walkers were displayed rotating counterclockwise but participants could perceive them rotating in either direction. Participant's task was to report perceived rotation direction.



Solid cube (left) used as control. Stick figure walker (right) can be seen as either facing towards or facing away, but people display FTV bias.¹

Participants were students recruited from a voluntary participant pool comprised of both undergraduate and graduate students. 10 participants were excluded for failing control trials (<75% accuracy; all women). All statistical analyses were conducted on remaining 55 participants (32 women, 23 men, age: $M \pm SD = 19.95 \pm 2.32$ years)

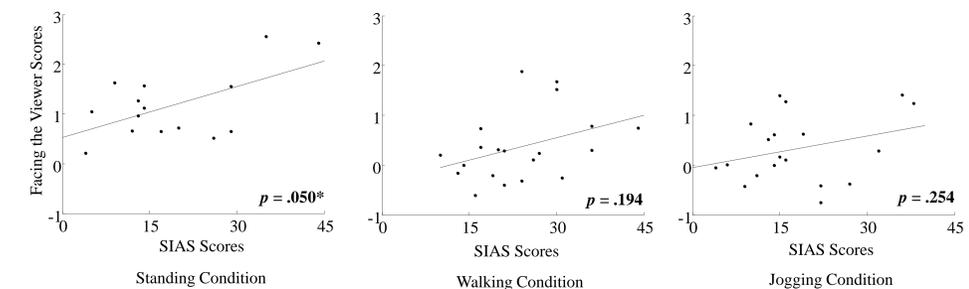
Results



- Our results supported our hypotheses:
- We found a **significant Exercise x Stimulus Type interaction**, Wilk's $\lambda = .76$, $F(4, 104) = 3.83$, $p = .006$, $\eta^2_{\text{partial}} = .13$.
- Participants in the walking ($p = .021$) and jogging conditions ($p = .005$) had significantly lower FTV scores than in the standing condition for full stick figure walkers only (see above Figure).

Results - Continued

- We found that SIAS scores and FTV scores for full stick figure walkers in the standing condition were significantly correlated (see Figure below). This correlation was not significant, however, for either the walking or jogging conditions



- We also found that lower FTV scores for full stick figure walkers were significantly correlated with greater heart rates after participants completed the exercise portion of the study, $r(53) = -.30$, $p = .027$

Conclusions

- Engaging in physical exercise significantly reduced the facing-the-viewer bias.
- Social interaction anxiety was positively correlated with the facing-the-viewer bias only in the control condition.
- Both exercise and anxiety interacted with facing-the-viewer biases for full stick figure walkers only, further suggesting that this bias is related to the social relevance of these figures.
- One way that exercise might provide anxiolytic benefits, therefore, is via reducing the threat bias (i.e., the bias for anxious individuals to interpret threat in situations of ambiguity).
- Future studies should attempt to manipulate anxiety more directly.

References

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3. Wipfli BM, Rethorst CD, Landers DM (2008) The anxiolytic effects of exercise: a meta-analysis of randomized trials and dose-response analysis. *J Sport Exerc Psychol* 30: 392–410.