

An anxiety-induced bias in the perception of a bistable point-light walker



Sander Van de Cruys*, Ben Schouten, Johan Wagemans

Laboratory of Experimental Psychology, University of Leuven, Belgium

ARTICLE INFO

Article history:

Received 3 June 2013
Received in revised form 27 August 2013
Accepted 21 September 2013
Available online 17 October 2013

PsychInfo codes:

2323 Visual Perception
2360 Motivation & Emotion
3120 Personality Traits & Processes
3211 Affective Disorders

Keywords:

Biological motion
Emotion
Bistability
Social anxiety

ABSTRACT

Human sensitivity for social cues is exquisite, as illustrated by the ease with which simplified point-light movements invoke social and emotional responses. Compared to faces, these biological motion stimuli only recently started to be used to explore questions regarding social cognition and anxiety. We presented human point-light walkers that could be perceived as facing towards or facing away from the observer, and tested whether participants with high social anxiety would perceive these bistable stimuli differently, because this type of stimuli has particular relevance for them. The results showed that observers with high social anxiety tended to see walkers as facing away more frequently than those with low social anxiety. This may mean that high socially anxious observers are biased towards the more positive perceptual alternative because they are motivated to protect themselves against threatening social experiences, but we also explore alternative explanations. The findings are in line with the evidence for a positivity bias in perception, also called wishful seeing, but in contrast with the attentional negativity bias often found in social anxiety. We discuss reasons for this divergence and possible limitations of the current study.

© 2013 Elsevier B.V. All rights reserved.

1. Introduction

The French–Cuban writer Anaïs Nin wrote “we do not see things as they are but as we are.” For scientists, the question of whether this could literally be true is a fascinating, albeit a thorny one. Surely perception unchecked by external reality (i.e. hallucination) would serve us poorly. But when allowed only a glimpse, a perception biased by our own fears or hopes might enable faster or more appropriate responses. Theoretically, a role of emotion in perception has become more plausible since it has become clear that seeing relies heavily on top-down information flows, which include affective context (Barrett & Bar, 2009). Empirically, two opposing patterns of results have emerged. On the one hand, several studies find a negativity bias: a bias towards negative or threatening emotional stimuli, including the large body of work on attentional bias for negative facial expressions (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & Van IJzendoorn, 2007) and on better detection of negative stimuli (e.g. Dijksterhuis & Aarts, 2003). Reports by Stefanucci, Proffitt, Clore, and Parekh (2008) that acrophobic volunteers estimated vertical distances to be greater also fit within this negativity bias. Finally, negative emotional faces seem to break through more easily in continuous flash suppression (Yang, Zald, & Blake, 2007) and in binocular rivalry (Alpers & Gerdes, 2007), although for the latter a general emotional enhancement, irrespective of valence, is also reported.

By contrast, a second line of studies reports a positivity bias, also called wishful seeing. This line dates back to the 1940s, when it was found that observers tended to perceive the interpretation of an ambiguous figure that was previously rewarded (e.g., Schafer & Murphy, 1943). This tradition has received renewed attention recently with two studies confirming a role for motivation in perception. One used distance estimation and a throwing task to find that desired objects are seen to be closer (Balcetis & Dunning, 2010), while another showed that the first percept we experience for a bistable figure (e.g. 13 vs. B) can be influenced by what we currently prefer to see (Dunning & Balcetis, 2013). Finally, Voss, Rothermund, and Brandtstädter (2008) rewarded or punished ambiguous color patches differently and found that positive or non-negative stimuli required less information to be classified and were processed faster. Hence, the enhanced perception of positive perceptual alternatives seems to be more than just a post-perceptual decision bias.

Apparently, it can be hard to predict what type of bias (positive or negative), if any, will emerge in a particular perceptual situation involving emotional stimuli. Indeed, task context and even personality traits may play a crucial role. For example, trait emotion could be an important modulating factor, but most studies only looked at stimulus-emotion or short-term induced emotion. Gray, Adams, and Garner (2009) did look at trait anxiety in relation to binocular rivalry with faces and found that highly anxious individuals tend to perceive angry and fearful faces as more dominant, consistent with a negativity bias. Additionally, methodological concerns hamper the evaluation of the available evidence. The studies using distance estimation are prone to post-perceptual decision

* Corresponding author at: University of Leuven (KU Leuven), Laboratory of Experimental Psychology, Tiensestraat 102, Box 3711, BE-3000 Leuven, Belgium.

E-mail address: sander.vandecruys@ppw.kuleuven.be (S. Van de Cruys).

biases, while in the binocular rivalry studies there is the additional problem of low-level differences between neutral and emotional stimuli (e.g. faces) which could cause the observed differences in perception. We used a different bistable stimulus, an ambiguous point-light walker, to accommodate for these shortcomings.

Vision scientists have embraced biological motion stimuli, constructed from a handful of moving dots placed on the joints of a moving actor, because of the balance they strike between fine manipulability and immediate social and ecological relevance. Viewers easily recognize the gender, emotions and intentions of these figures based on gait dynamics (for a review, see Blake & Shiffrar, 2007). Fewer studies explored their potential bistability, first noticed by Vanrie, Dekeyser, and Verfaillie (2004). When projected without perspective information (orthographic projection), a walking figure facing the viewer can just as well be seen as facing away from the viewer, a categorically different percept (Fig. 1). Both interpretations are anatomically plausible and in principle equally likely. Importantly, low-level input characteristics remain exactly the same for both percepts. It turns out, however, that people perceive the walker in about 80% of the cases as facing them (Vanrie et al., 2004). The social or biological relevance of a person facing you is considered to be at least partly responsible for this so-called facing bias (Brooks et al., 2008; Vanrie et al., 2004). Indeed, the cost of not detecting an approaching person is potentially much higher than that of a false alarm.

Although social anxiety disorder (social phobia) only appeared in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) in 1980, it is today one of the most common psychiatric disorders. The 12 month prevalence in the general population is 15.6%, but signs of social anxiety as a personality trait (shyness, fear of public speaking, social avoidance) are widespread in healthy populations (Furmark et al., 1999). Assuming that for people with high social anxiety the difference in relevance of the two percepts of the biological walker is even more pronounced, we conjectured that this would be reflected in how these people perceive the walkers. In the real world, a person walking up to you implies an imminent social interaction with this agent. Note, however, that the body is reduced to a few dots in these stimuli, and the face is completely absent (one dot). Hence, these walkers are objectively neutral and any bias will be in the eye of the beholder. Since no fear-inducing cues (e.g. a facing face) are present, they can be considered to be the cleanest test for a fear of approach as such.

Based on the studies finding a stronger attentional and interpretational bias in phobics towards objects of their fears (Bar-Haim et al., 2007), and one report of increased dominance of negative faces in binocular rivalry for anxious people (Gray et al., 2009), we deemed it

likely that a similar tendency would hold for our bistable stimuli. Namely, that people with high social anxiety would perceive the walker in its more threatening, approaching configuration and thus would report more facing towards viewer percepts, compared to non-anxious subjects. Still, we acknowledged from the outset that our stimuli were in several ways quite different from those previously used, most importantly that there was no explicit emotional manipulation within them. We were also aware of the studies finding a positivity bias, which led to the formulation an alternative hypothesis that predicts what one could call a self-serving bias in perception: a tendency to perceive the safer configuration of a person walking away from you. The latter bias could come about by an active enhancement of the more positive percept signaling no social interaction, or by an active avoidance of the more negative percept signaling a future social interaction, consistent with what is found for social stimuli in daily life in social anxiety.

2. Method

2.1. Participants

On the basis of a validated, reliable questionnaire for social anxiety (Liebowitz Social Anxiety Scale; Fresco, Coles, & Heimberg, 2001; Liebowitz, 1987) we selected high and low socially anxious participants from a pool of 450 first bachelor psychology students. People with low anxiety had a total score lower than 25 (percentile .25, $n = 19$, $M = 15.3$, $SD = 4.53$, all females), while those with high social anxiety had a score higher than 65 (percentile .88, $n = 18$, $M = 76.8$, $SD = 8.02$, all females). The cutoffs were chosen to closely match the normative study of Fresco et al. (2001), in which non-anxious controls had a mean score of 14.5, while the patients diagnosed with social anxiety disorder had a mean score of 74.5 on the questionnaire. To avoid artifacts and to exclude clinical anxiety, people with very low (<5) and very high (>85) scores were excluded. A brief questionnaire after the actual experiment confirmed that none of the participants were diagnosed with a clinical mental disorder. They received course credit for their participation. All the participants had normal or corrected-to-normal vision. The study was approved by the Ethical Committee of the Faculty of Psychology and Educational Sciences of the University of Leuven. Written informed consent was obtained from all participants.

2.2. Stimuli and procedure

Following a procedure developed by Schouten and Verfaillie (2010), we parametrically varied the amount of perspective information in the point-light walkers to systematically measure the bias for each participant. In practice, this boils down to disambiguating the walker by adding small amounts of perspective information of a walker that either approaches or walks away. In perspective projection a change in the distance between the collection of dots and the projection plane (or equivalently the field of view angle) causes a change in the relative locations of the 2-D projections of the dots on the display (for more details, see Schouten & Verfaillie, 2010). A period of two to four months separated the screening from the actual experiment, which made the link less obvious. Participants were not informed about their social anxiety score, and the experimenter was blind to the social anxiety group the participants belonged to. In a dimly lit, soundproof room the participants were randomly presented with a point-light walker (15 dots placed on coordinates from Troje (2002); 8° of visual angle) of one out of 13 different levels of perspective information, for a total of 520 trials (40 repetitions per level). Observers had to respond with the up and down arrows of the keyboard to indicate whether they saw the walker as facing towards or away from them (2-alternative forced choice). The walker remained on screen till the subject responded (no time limit). We instructed participants to focus on the center of the stimulus throughout the presentation and to respond according to their first impression.

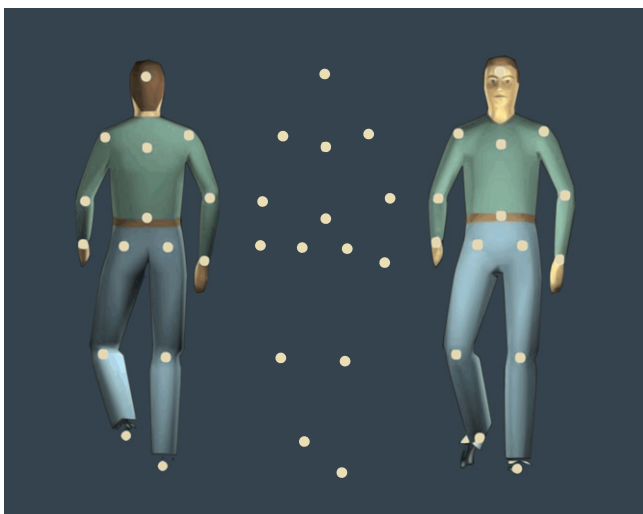


Fig. 1. Point-light stimulus (middle) flanked by overlays illustrating the two possible interpretations.

Download English Version:

<https://daneshyari.com/en/article/10453806>

Download Persian Version:

<https://daneshyari.com/article/10453806>

[Daneshyari.com](https://daneshyari.com)