Brief research report

# Seeing ghosts: Negative body evaluation predicts overestimation of negative social feedback

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## ARTICLE INFO

## ABSTRACT

The current study investigated whether negative body evaluation predicts women's overestimation of negative social feedback related to their own body (i.e., *covariation bias*). Sixty-five female university students completed a computer task where photos of their own body, of a control woman's body, and of a neutral object, were followed by nonverbal social feedback (i.e., facial crowds with equal numbers of negative, positive, and neutral faces). Afterward, women estimated the percentage of negative, positive, and neutral social feedback that followed their own body, the control woman's body, and the neutral object. The findings provided evidence for a covariation bias: negative body evaluation predicted higher estimates of negative social feedback for women's own body, but not for the other stimuli. Additionally, the covariation bias was not explained by differences in how women interpreted the social feedback (the facial stimuli). Clinical implications of the covariation bias to body image are discussed.

## Introduction

Cognitive-behavioural perspectives on body image propose that body evaluation (i.e., satisfaction or dissatisfaction with one's body) has a profound influence on cognitive processing, and vice versa (see Cash, 2011, for a review). For example, individuals with negative body evaluation may demonstrate various distortions in cognitive processing, such as dichotomous thinking (e.g., "If I'm not a size 0 then I must be fat!"), biased social comparisons (e.g., with media models), and magnification/minimisation (e.g., of perceived flaws in appearance; Cash, 2011; Jakatdar, Cash, & Engle, 2006). In turn, distortions in cognitive processing may serve to reinforce and maintain negative body evaluation (Williamson, White, York-Crowe, & Stewart, 2004).

Likewise, cognitive-behavioural perspectives propose that interpersonal experiences play a crucial role in shaping body evaluation (Cash, 2011). Social feedback, ranging from implicit body language and gaze to explicit comments and teasing, has the power to make individuals feel dissatisfied with their body (for details, see Carlson Jones, 2011; Cash & Fleming, 2002; Fredrickson & Roberts, 1997; Tantleff-Dunn & Lindner, 2011). In addition, negative body evaluation may also cause individuals to behave in ways that actually elicit negative social feedback from others (e.g., by avoiding eye contact, by not approaching others), thereby creating a self-fulfilling prophecy that confirms their beliefs (e.g., "I really am fat and unapproachable!") and maintains negative body evaluation (Cash & Fleming, 2002; Tantleff-Dunn & Lindner, 2011).

In the present study, we sought to integrate the domains of cognitive processing and interpersonal experiences with regard to body evaluation. In particular, we investigated the role of negative body evaluation on covariation bias with regard to interpersonal experiences, which has not been investigated before.

*Covariation bias* is a distortion in cognitive processing whereby an individual overestimates the contingency between a certain stimulus and an aversive outcome, even when in reality the contingency is absent or is correlated in the opposite direction (Chapman & Chapman, 1967). In the field of psychopathology, covariation bias has most often been studied with regard to anxiety. For example, experimental studies have shown that individuals with spider phobia overestimate the association between images of spiders and an electric shock (e.g., De Jong, Merckelbach, Arntz, & Nijman, 1992; Tomarken, Mineka, & Cook, 1989; Tomarken, Sutton, & Mineka, 1995). Furthermore, there is also evidence to suggest that individuals with social anxiety disorder overestimate the relation between social stimuli (e.g., ambiguous social situations) and aversive outcomes (e.g., negative social feedback; Hermann, Ofer, & Flor, 2004). Regardless of the context in which it is studied, covariation bias may

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have a direct and powerful influence on confirming danger expectations, enhancing fear, and maintaining psychological distress (De Jong, Van Den Hout, & Merckelbach, 1995; Hirsch & Clark, 2004).

We proposed that a covariation bias may also play a role in individuals with a negative body evaluation. Similar to covariation bias in individuals with social anxiety disorder, it could be that individuals with a negative body evaluation overestimate the relation between their own body (the stimulus) and negative social feedback (the aversive outcome). Consequently, this covariation bias may confirm negative expectations (e.g., "Everyone really does think that I am unattractive!") and maintain psychological distress (i.e., negative body evaluation; Bentz, Williamson, & Smith, 1999; Williamson et al., 2004). Further, this covariation bias could be an additional distortion in cognitive processing that affects body evaluation, one that may influence how individuals perceive their interpersonal experiences and thus how individuals feel about their body.

In the present study, women completed a computer task wherein photos of their own body, of a control woman's body, and of a neutral object, were followed by nonverbal social feedback (i.e., facial crowds with equal numbers of negative, positive, and neutral faces). Images of faces are commonly used to simulate social feedback in research about social anxiety (Hirsch & Clark, 2004) and have been shown to produce corresponding physiological responses in participants (e.g., photos of angry faces increase skin conductance responses; Dimberg, 1997; Merckelbach, van Hout, van den Hout, & Mersch, 1989). After the computer task, women estimated the total percentage of negative, positive, and neutral social feedback that they thought followed their own body, the control woman's body, and the neutral object. This type of estimate, in which participants estimate the frequency that a stimulus (e.g., their body) is followed by a particular outcome (e.g., angry faces), is commonly used to investigate covariation bias (Hermann et al., 2004; Hirsch & Clark, 2004; Tomarken et al., 1995).

Reflecting the proposed covariation bias, we hypothesised that women with a more negative body evaluation would estimate a higher level of negative social feedback for their own body. We included the additional stimuli (photos of the control woman and of the neutral object) to control for the selectivity of the covariation bias. In addition, we recorded how positively or negatively women rated the social feedback stimuli to test whether body evaluation also predicted the interpretation of the stimuli.

## Method

### Participants

Participants were 65 women aged between 18 and 30 years ($M = 21.17$, $SD = 2.60$) with a self-reported body mass index (BMI) between 16.76 and 29.41 ($M = 21.17$, $SD = 2.42$).[1] The participants were students at a university in the south of the Netherlands, where the student population is predominantly Caucasian. A power analysis using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) showed that the power achieved by this sample size was .73.

### Materials

**Computer task**. Participants received the following information on the computer screen: (a) in one of four quadrants they would see a photo of themselves, a photo of another woman (i.e., the control woman), or a photo of an object; (b) as soon as they saw the photo, they should click on it as quickly as possible; (c) after they clicked

on the photo, a group of portrait photos would briefly appear; and (d) Steps (a) to (c) would be repeated until they reached the end of the computer task.

The photos for Step (a) were three full-body photos of the participant, three full-body photos of a control woman, and three photos of a neutral object. Each photo was presented 30 times, for a sum of 270 trials. The control woman was a female university student of average build, dressed in a black t-shirt and pants. A standing lamp was chosen as the neutral object because it roughly resembled a human shape.

The photos used for Step (c) were different than those used for Step (a). The photos for Step (c) were chosen from the NimStim Facial Stimuli Set (Tottenham et al., 2009) and consisted of sets of portrait photos of nine Caucasian men and nine Caucasian women, chosen based on the highest validity for the emotions portrayed. There were portrait photos signalling negative (angry, mouth closed), positive (happy, mouth closed), and neutral (mouth closed) social feedback for each man and woman (54 portrait photos total). The portrait photos were arranged in a $4 \times 3$ matrix, which was presented for 400 ms per trial (Baccus, Baldwin, & Packer, 2004). The matrix for each trial was different because the portrait photos that composed the matrices were randomised per participant. However, for each matrix the following rules were met: (a) there was an equal proportion of negative, positive, and neutral social feedback; (b) 50% of the portrait photos were of female faces; and (c) portrait photos could only appear once in each matrix. So, each matrix consisted of 12 portrait photos that were of six different women (two angry, two happy, two neutral) and six different men (two angry, two happy, two neutral). Each portrait photo was presented an equal number of times across the computer task.

**Estimates of social feedback**. Participants estimated the amount of negative, positive, and neutral social feedback that they perceived during the computer task, with regard to: (a) their own body, (b) the control woman's body, and (c) the neutral object (the lamp). Therefore, a total of nine estimates of social feedback were retrieved. An example of these items is, "All in all, how many (%) of the portrait photos were positive (smiling) after the presentation of the photos of your own body?" Participants indicated their estimates on the computer by sliding a small tick across a bar ranging from 0% to 100%. Each estimate of social feedback was given separately and the order of the questions was randomised per participant. To disguise the purpose of the study, we also included six filler estimates (e.g., about the percentage of portrait photos of women).

**Body evaluation**. The Multidimensional Body-Self Relations Questionnaire (MBSRQ; Brown, Cash, & Mikulka, 1990; Cash, 2000) was used to measure trait body evaluation. The MBSRQ consists of 69 items (e.g., "I like my looks just the way they are") rated on 5-point scales (1 = *definitely disagree* to 5 = *definitely agree*). Only items from the Appearance Evaluation subscale (satisfaction with one's appearance; seven items) and the Body Areas Satisfaction Subscale (satisfaction with specific aspects of one's appearance; nine items) were used. As suggested by Cash (2000), we averaged the normalised Z-scores of these two subscales, with higher scores reflecting more positive body evaluation. The Appearance Evaluation Subscale and the Body Areas Satisfaction Subscale evidenced good internal consistency ($\alpha = .88$ and .73) and one month test–retest reliability ($r = .91$ and .74) in women over 18 years old (Cash, 2000). In the current sample, the internal consistency for the items of these two subscales together was $\alpha = .88$.

The Body Image States Scale (BISS; Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002) was used to measure state body evaluation. The BISS consists of six 9-point scale items that measure the following dimensions based on how the participant feels "right now, at this very moment:" (a) dissatisfaction-satisfaction with physical appearance, (b) dissatisfaction-satisfaction with body

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[1] Seventeen participants did not provide information about their height and/or weight, so their BMI could not be calculated.