

# ASSESSING THE INFLUENCE OF BODY-RELATED ATTENTIONAL BIAS IN THE RELATIONSHIP BETWEEN GENDER AND BODY DISSATISFACTION

## A Virtual Reality and Eye-Tracking study



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## Introduction

Several studies have found that women typically present higher body dissatisfaction levels than men (e.g., Tiggemann & Pennington, 1990) suggesting that women and men differ in their body image concerns (Alfano, Hildebrandt, Bannon, Walker, & Walton, 2011) and evaluate their appearance in different ways, for example, by showing a different body-related Attentional Bias (AB) toward their respective body parts (Porras-Garcia et al., 2019).

**ATTENTION:** AB is described as the preference to pay more attention to some type of stimuli or information (e.g., disorder-relevant information) over other sorts of information (Williamson et al., 2004).

Gender differences on AB has been already confirmed on two previous studies, in which Eye-Tracking (ET) and Virtual Reality (VR) technologies were combined to assess gender differences in AB using a VR-based embodiment procedure, in which women showed an AB toward weight-related body parts, while men showed the opposite gaze behavior (Porras-Garcia et al., 2018), specifically toward muscular-related body parts (Porras-Garcia et al., 2019).

**PROPOSAL:** However, little information is available about the impact of gender on body dissatisfaction when the influence of body-related attention is properly controlled. A combination of a VR-based embodiment technique and ET attentional bias assessment was used to assess the relationship between gender, body-related attention and body dissatisfaction

## Methods and Materials

**SAMPLE:** Eighty-two participants (43 women and 39 men) from the University of Barcelona, participated in the study.

**INSTRUMENTS:** The HMD HTC-VIVE with a Pupil Labs ET device add on, was used in this experiment. The virtual environment was a simple room without any furniture, and with a large mirror on the wall in front of the participant's avatar.

All participants were embodied in a virtual avatar with their real measurements (real-size virtual body), while their real-time attention patterns were measured.

Additionally, body dissatisfaction levels after owning a real-size virtual body were measured using a figural drawing scale questionnaire (BIAS-BD, Gardner, Jappe, & Gardner, 2009).

## VIRTUAL REALITY PROCEDURE & EYE-TRACKING ASSESSMENT TASK

**1<sup>st</sup>.** A photo of the whole body of each participant was taken by the experimenters. Different virtual avatar measures (e.g. arms, legs, hips, etc.) were adapted to fit the participant's silhouette.

**2<sup>nd</sup>.** A Visuo-tactile stimulation procedure was applied, consisting of a series of continuous touches to some specific body parts (the arms, the abdomen, and the legs) with one of the HTC-VIVE controllers.



Figure.2.1. Photo of the whole body



Figure.2.2. Visuo-tactile stimulation procedure

**3rd. ET Calibration and validation:** The accuracy of the eye-tracking recordings was measured by a nine-point calibration procedure.

**4th. ET Recording data:** Participants were instructed to look at the avatar reflected in the mirror for 30s while spontaneous eye movements were recorded.

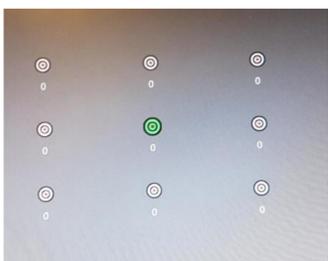
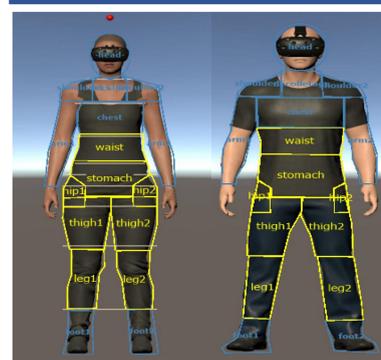


Figure.2.3. Eye-Tracking (ET) nine-point calibration procedure.



Figure.2.3. Eye-Tracking (ET) recording data.

## Areas of interest (AOIs) design



■ No weight-related AOIs  
■ Weight-related AOIs

To analyze the gaze data, **Weight-related Areas of Interest (W-AOIs)** and **Non-Weight-related Areas of Interest (NW-AOIs)** were defined.

\* An additional data transformation was conducted by **subtracting the difference between weight-related and non-weight-related AOIs.**

Figure 3. Visual description of the Weight-related and Non-Weight-related Areas of Interest (AOIs), in the female and male avatar.

## Results

A simple moderation analysis was performed, with complete fixation time as a quantitative moderator.

1. Body dissatisfaction was significantly predicted by gender and by the interaction between gender and complete fixation time toward the body ( $p < .05$ ). Consequently, the conditional effects of gender on body dissatisfaction depended on the attentional bias toward the weight- or non-weight-related body areas.

2. The interaction was probed by testing the conditional effects of gender at three continues levels of complete fixation time toward the body, one standard deviation below the mean, at the mean, and one standard deviation above the mean.

• More specifically, gender differences **were not significantly** related to body dissatisfaction ( $p > .05$ ) in women and men who showed a preference to attend to non-weight-related body areas.

• However, gender differences **were significantly related** to body dissatisfaction ( $p < .05$ ) in participants who showed a preference to attend to weight-related body parts; specifically, women significantly reported higher body dissatisfaction levels than men, when both genders showed an AB toward weight-related body parts.

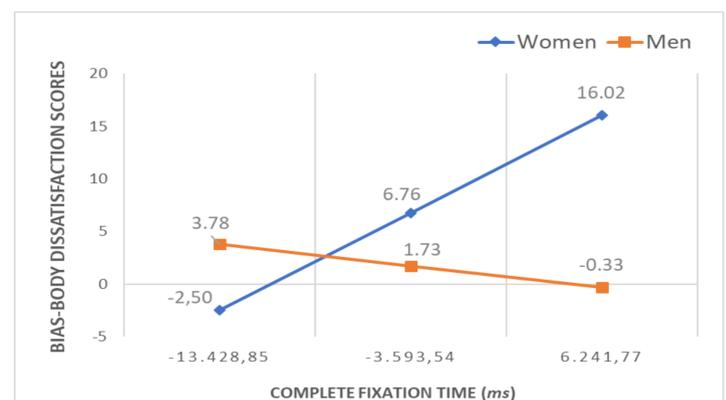


Figure 4. Impact of gender on body dissatisfaction moderated by the influence of body-related attention, after owning a real-size virtual body.

## Discussion

Our results suggest that gender differences observed in body dissatisfaction levels are significantly influenced by the body-related attention, and specifically by AB toward weight-related body parts. Indeed, several studies have found that AB toward one's self-reported unattractive body parts elicits higher body dissatisfaction in women (Smeets, Jansen & Roefs, 2011), adolescents with anorexia and bulimia nervosa, and in healthy adolescents (Bauer et al., 2017). Our results suggest that this influence between body-related attention and body dissatisfaction may differently affect women and men, when both genders attended more at weight-related body areas.

Future psychological interventions that aim to reduce body dissatisfaction levels in healthy participants and Eating Disorder patients should focus on changing dysfunctional body-related attentional patterns separately for women and men. The combination of Virtual Reality and Eye-tracking technologies opens up promising new possibilities in the assessment of, and intervention in, body image dissatisfaction.

## Contact

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