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ORIGINAL ARTICLE

Gender differences in state body satisfaction, affect, and body-related attention patterns towards one's own and a peer's body: an Eye-Tracking Study with Women and Men

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Abstract

Background Body-related attentional biases are assumed to contribute to the development and maintenance of body-related concerns or specific mental disorders such as eating disorders. However, while studies have indicated gender-specific differences in body-related concerns, less is known about gender-specific differences in body-related attention allocation.

Methods An eye-tracking paradigm was used to assess women's ($n = 41$) and men's ($n = 42$) attention patterns towards their own and a peer's body. Additionally, state body satisfaction and affect were examined.

Results While both women and men showed higher state positive and negative affect after viewing one's own body than after viewing a peer's body, only women displayed worse state body satisfaction after viewing one's own body than after viewing a peer's body. Conversely, both genders showed a similar deficit-oriented attention pattern, irrespective of the presented body type.

Conclusions The findings provide evidence of gender-specific differences in state body satisfaction after viewing one's own and a peer's body. However, these differences do not seem to be reflected by gender differences in body-related attention allocation. As both women and men showed a deficit-oriented attentional bias, they might benefit from interventions which aim to establish a functional or self-serving way of looking at one's own body.

Keywords Gender differences · Body-related attention allocation · Body-related attentional bias · State body satisfaction · State affect

Introduction

A growing number of studies in the recent years have provided evidence that body dissatisfaction is widespread among both women and men (e.g., Fallon et al., 2014). However, body dissatisfaction seems to manifest differently between the two genders. While thinness-oriented body dissatisfaction seems to be more pronounced in women than in men, muscularity-oriented body dissatisfaction tends to be higher in men than in women (Karazsia et al., 2017; Pritchard & Cramblitt, 2014). It is consistently found that women are more likely to engage in behavioral strategies to lose or control weight, use restraint eating, or exercise with the intention of weight loss, whereas men are more likely to perform muscularity-enhancing behaviors and exercise in order to increase muscularity (McCabe & James, 2009; Haynos et al., 2018). Accordingly, weight- or thinness-related body dissatisfaction has been found to be more prevalent in women than in men (Frederick et al., 2006; Matthiasdottir et al., 2012; Rodgers et al., 2009). However, studies that

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also focused on muscularity-oriented body dissatisfaction (e.g., dissatisfaction with one's own muscle tone) likewise reported higher dissatisfaction rates in women (Fallon et al., 2014). Consistently, it was found that women place greater importance on their own appearance and would be willing to invest more time to achieve their individual body ideal (Quittkat et al., 2019). Furthermore, previous studies also indicated that men tend to evaluate themselves or their own bodies in a more favorable way than do women (e.g., men are less likely to consider themselves as overweight) (Lemon et al., 2009) and are more likely to show self-serving double standards in the form of an upward revaluation of idealized bodies when these are combined with their own faces (Voges et al., 2019). Nevertheless, in previous studies, body dissatisfaction was found to be associated with various negative outcomes in both women and men, including increased eating disorder pathology (e.g., Wei et al., 2021), body dysmorphic disorder symptoms (e.g., Hartmann et al., 2018), and depressive mood (e.g., Sharpe et al., 2018), as well as low self-esteem (e.g., Paxton et al., 2006). Therefore, it seems to be of high clinical relevance to identify the factors that potentially trigger and maintain body dissatisfaction and related psychopathology in women and men, and to explore the mechanisms that might contribute to the mentioned gender-specific differences.

Within this context, it has been suggested that, amongst other factors such as the perceived sociocultural pressure to comply with specific appearance norms (see, for instance, Johnson et al., 2015), body-related attentional biases might play a crucial role in initiating and/or perpetuating body dissatisfaction or related psychopathology, e.g., body image disturbance (Cordes et al., 2015) and eating disorder pathology (Aspen et al., 2013; Williamson et al., 2004). More specifically, these cognitive-behavioral models assume that body-related attentional biases are associated with negative emotions such as disgust or shame towards one's body, as well as with the initiation of dysfunctional compensatory behaviors (e.g., including dieting or excessive exercise). While such behaviors lead to short-term relief, in the long run they may lead to adverse effects such as initiating or maintaining body image disturbance or disordered eating (see Aspen et al., 2013; Cordes et al., 2015; Williamson et al., 2004). In line with these suggested associations, and in view of findings pointing to widespread body dissatisfaction in both women and men (e.g., Fallon et al., 2014), previous research has provided evidence of dysfunctional body-related attention allocation (e.g., towards one's own subjectively unattractive body areas). This was reported in women with eating disorders (Tuschen-Caffier et al., 2015), in women with elevated eating disorder pathology (Jansen et al., 2005), and in women with an unrestrained eating style who had a higher body mass index and had evaluated their own body more negatively than another woman's body (Roefs et al., 2008). Correspondingly, men with muscle dysmorphia as well as healthy non-weight-training controls were found to show dysfunctional body-related attention patterns, characterized specifically by biased attention allocation towards subjectively unattractive areas of one's own body and towards subjectively attractive areas of a lean-muscular peer (Waldorf et al., 2019). Moreover, there is evidence of divergent attention patterns in men with a high drive for thinness and men with a high drive for muscularity. For instance, Cordes et al., (2016) found that men with a high drive for thinness displayed a rather deficit-oriented attention pattern towards their own body (i.e., they looked longer at their own subjectively unattractive body areas than at their own subjectively attractive body areas). Conversely, those with a high drive for muscularity were more likely to allocate their attention towards subjectively attractive areas of their own body. However, as this latter viewing pattern might also represent a kind of body-checking behavior (e.g., to check one's own muscle size or growth), it might not necessarily be interpreted as being functional but may equally be associated with elevated body-related concerns (Cordes et al., 2016; Walker et al., 2009).

While the above-mentioned studies consistently indicated that biased body-related attention allocation might be present in both women and men and may also be associated with body-related concerns, it is worth noting that only a small number of studies have explored gender-specific differences (see Cho & Lee 2013; Porras-Garcia et al., 2019; Warschburger et al., 2015). Given the large number of studies pointing to gender differences in body dissatisfaction (e.g., Karazsia et al., 2017; Matthiasdottir et al., 2012), it appears to be of high clinical relevance to explore whether there are equivalent differences in body-related attention allocation. This may help identify which factors potentially contribute to gender differences in body dissatisfaction and inform the development of suitable gender-specific preventive strategies to effectively maintain mental health in both women and men. So far, research has already provided evidence of gender-specific differences in body-related attention allocation towards a diverse set of computer-generated bodies (i.e., a thin, normal, muscular, and fat female/male body) (Cho & Lee, 2013). More specifically, women with high body dissatisfaction were found to show an attentional bias towards an idealized thin body while men with high body dissatisfaction allocated their attention towards an idealized muscular body (Cho & Lee, 2013). In line with this, Porras-Garcia et al., (2019) found that when participants were sequentially exposed to three gender-matched virtual bodies, two of which corresponded to the participant's actual body size, women showed an attentional bias towards weight-related body parts (i.e., the thighs, legs, buttocks,

hips, stomach, and waist), whereas men paid more attention to muscularity-related body parts (i.e., the chest, arms, shoulders, abdomen, and lower legs). However, to the best of our knowledge, only one previous study has compared women and men on how they evaluate their subjectively attractive and unattractive body areas (see Warschburger et al., 2015). In contrast to prior expectations, this previous study found that normal-weight and overweight women looked longer at subjectively attractive body areas than did men, while men paid more attention to subjectively unattractive body areas than did women (Warschburger et al., 2015). Nevertheless, as the study did not assess participants' cognitive-affective reactions during or shortly after viewing the body pictures, it remains unclear whether the positive attentional bias in women indeed represents a rather functional viewing pattern, or whether it instead reflects a kind of avoidance or coping behavior (e.g., to handle negative feelings associated with looking at one's own body) (Warschburger et al., 2015).

Consequently, to help close this research gap, the current study aimed to analyze whether there are gender-specific differences in cognitive-affective measures (i.e., in state body satisfaction and affect) after viewing one's own and a peer's body, and whether these are reflected by equivalent gender differences in body-related attention patterns towards one's own and a peer's subjectively attractive and unattractive body areas. For this purpose, participants were shown pictures of their own and a peer's body while their eye movements were tracked. Subsequently, participants completed attractiveness ratings for their own and the peer's body as well as questionnaires on state body satisfaction and affect. As previous studies suggested higher body dissatisfaction in women than in men (e.g., Fallon et al., 2014; Matthiasdottir et al., 2012), more rigid appearance norms for women than for men (e.g., Buote et al., 2011), and a greater tendency to engage in unfavorable appearance-based social comparisons in women than in men (e.g., Franzoi et al., 2012), we first assumed that compared to men, women would show worse state body satisfaction (hypothesis 1), lower positive affect (hypothesis 2), and higher negative affect (hypothesis 3) after viewing one's own and a peer's body. Accordingly, we assumed that women and men would also differ in their specific attention allocation towards subjectively attractive and unattractive areas of their own and a peer's body. Specifically, women were expected to show an attentional bias towards subjectively unattractive areas of their own body and towards subjectively attractive areas of a peer's body, while men were expected to show a balanced attention pattern towards their own and a peer's subjectively attractive and unattractive body areas (hypothesis 4).

Method

Participants and Recruitment

The data of the current study were derived from a broader research project. In addition to the exploration of gender differences in body-related attention allocation, the broader research project also examined the familial transmission of attention allocation within mother-daughter dyads (Bauer et al., 2017a) and father-son dyads (Arkenau et al., 2022). Initially, fifty women and fifty-one men were recruited. Of these, nine women and nine men were excluded from the current analyses (e.g., due to incomplete questionnaires or dropout), thus resulting in a sample size of forty-one women and forty-two men ($N = 83$). The recruitment of the female and male participants was conducted via press releases and email lists of the local university, as well as notices on social media platforms and in regional newspapers and local leisure facilities (e.g., gyms, sports clubs). Acute suicidality and self-harm behavior were applied as exclusion criteria. These criteria were assessed by an M.Sc.-level clinical psychologist using the following questions: "Do you harm yourself intentionally?" and "Do you currently have negative thoughts about your life or do you think about ending your life? Do you currently have concrete plans to end your life or have you already taken concrete actions for this purpose?".

Long-Term Psychometric Measures

Diagnostic Interview for Mental Disorders. To assess whether participants met the criteria for a current mental disorder at the time of study participation, we applied the Diagnostic Interview for Mental Disorders (Schneider & Margraf, 2011). This structured clinical interview is based on the fourth revision of the Diagnostic and Statistical Manual of Mental Disorders (German-language version: Saß et al., 2003) and the tenth revision of the International Classification of Mental and Behavioural Disorders (German-language version: Dilling et al., 2015) and was conducted by an M.Sc.-level clinical psychologist.

Eating Disorder Examination-Questionnaire (EDE-Q). Potentially existing eating disorder symptoms and body-related concerns during the last 28 days were examined using the EDE-Q (Fairburn & Beglin, 1994; German-language version: Hilbert & Tuschen-Caffier 2016). The EDE-Q is a self-report questionnaire that consists of 22 items allocated to the following four subscales: *Restraint* (five items), *Eating Concern* (five items), *Weight Concern* (five items), and *Shape Concern* (eight items). The items are rated on a 7-point Likert scale ranging from 1 = *no days/*

not at all to 6 = *every day/markedly*. In the current study, the Cronbach's alpha of the EDE-Q subscales ranged from α = 0.76 – 0.88 for women and from α = 0.74 – 0.89 for men.

Short-Term/State Psychometric Measures

Body Areas Attractiveness Ranking. To examine the perceived attractiveness of specific areas of one's own and the peer's body after body picture presentation, participants were asked to form a gender-specific attractiveness hierarchy. Following a previously applied procedure (Bauer et al., 2017c), the female participants had to rank the following 12 body areas: abdomen, décolleté, chest, upper arms, forearms, thighs, lower legs, upper back, lower back, bottom, feet, and hands. Due to gender-specific anatomical differences and in view of previous findings indicating that men pay a great deal of visual attention to the genital area of their own and other men's bodies (Cordes et al., 2016), the attractiveness hierarchy for the male participants was adapted by replacing the body area "décolleté" with the body area "shoulders" and adding the body area "genitals" (see Cordes et al., 2016). Participants were asked to rank the body areas from *most unattractive* to *most attractive*.

Body Image States Scale (BISS). The BISS (Cash et al., 2002; German-language version: Vocks et al., 2007) was used to assess participants' state body image after looking at the pictures of one's own and a peer's body. This self-report questionnaire encompasses six items representing the following dimensions: satisfaction with overall physical appearance, satisfaction with height and body shape, satisfaction with weight, feelings of physical attractiveness, and the current evaluation of one's own physical appearance relative to one's usual estimation, or relative to an average-looking person, respectively. The items are rated on a 9-point Likert scale ranging from 0 = *very satisfied/attractive/much better* to 8 = *dissatisfied/unattractive/much worse*. In the current study, the internal consistencies of the BISS scores ranged from α = 0.90 – 0.91 for women and from α = 0.91 – 0.92 for men.

Positive and Negative Affect Schedule (PANAS). To assess participants' affective states after viewing the pictures of their own and the peer's body, the *Positive Affect* (PANAS-PA) and the *Negative Affect* (PANAS-NA) subscales of the PANAS (Watson et al., 1988) were used (German-language version: Krohne et al., 1996). The PANAS consists of ten affective adjectives per subscale, which are rated on a 5-point Likert scale from 1 = *not at all* to 5 = *extremely*. The Cronbach's alpha of the PANAS-PA scores ranged from α = 0.88 – 0.89 for women and from α = 0.88 – 0.89 for men, and the Cronbach's alpha of the PANAS-NA scores ranged from α = 0.82 – 0.85 for women and from α = 0.75 – 0.90 for men.

Eye-Tracking Stimuli and Assessment

For each participant, an individual photo presentation, encompassing pictures of one's own and a peer's body, was created prior to the eye-tracking session. The photos were taken under standardized conditions (i.e., in the same laboratory, in front of a white background with standardized lighting, and using a Panasonic Lumix DMC-TZ8 digital camera). Furthermore, participants were instructed to take the same four body positions (i.e., the front and back view and the side views), each time photographed from the neck down to the feet. All participants wore identical neutral grey underwear (underpants and bra for women and underpants for men) and were photographed by a gender-matched study assistant. The body pictures of the respective peer were taken under the same conditions and using the same procedure as described above. The female peer was 41 years old and had a BMI of 23.60 kg/m^2. The male peer was 40 years old and had a BMI of 26.56 kg/m^2. The anthropometric measurements correspond to the respective gender- and age-specific average height, weight, and BMI data determined for a German population-based sample (Destasis, 2018).

The eye-tracking assessment was conducted using the remote contact-free eye-tracking system *SMI RED 500* (SensoMotoric Instruments, Teltow, Germany). The system has an accuracy of 0.4°, a sampling rate of 500 Hz, and a spatial resolution of 0.03°. The eye-tracking stimuli (i.e., the pictures of one's own and the peer's body) were displayed on the accompanying 22'' computer monitor, which was placed about 60 to 80 cm in front of the participants. Prior to each eye-tracking trial, a 5-point calibration procedure was conducted. The participants' mean accuracy values (women: $M = 0.46$, $SD = 0.18$; men: $M = 0.43$, $SD = 0.18$) corresponded to the standards of adequate eye-tracking data quality as recommended by Holmqvist et al., (2011).

The analysis of participants' gaze behavior was limited to the frontal body pictures, as this most likely resembles the habitual perception of one's own body, and also increases comparability to other studies (e.g., Cordes et al., 2016; Roefs et al., 2008; Waldorf et al., 2019). To quantify participants' gaze behavior, specific areas of interest (AOIs) were defined. These AOIs were adapted based on the participants' gender and the aforementioned body areas attractiveness ranking. For the female participants, the AOI definition encompassed the following body regions: abdomen, chest, décolleté, upper arms, forearms, hands, thighs, lower legs, and feet. Accordingly, for the male participants, the AOI "décolleté" was adapted to the AOI "shoulders", and

additionally, the AOI "genitals" was defined (see Cordes et al., 2016). As a specifier of attention allocation, the variable fixation duration was extracted for each of the defined AOIs. In accordance with previous eye-tracking studies (e.g., Bauer et al., 2017c; Horndasch et al., 2012), the minimum fixation duration was set to 100 msec. Finally, the fixation duration on the respective three body areas rated as most attractive and most unattractive were summed up separately for one's own and the peer's body, thus resulting in four standardized variables of interest for each participant.

Procedure

Following an initial telephone contact, participants were informed about the main study procedure. Once participants verbally agreed to participate in the current study, they were sent written study information, the declaration of consent, as well as various questionnaires by mail. Approximately two weeks later, participants were then invited to the eye-tracking session at the laboratories of the local university and were asked to bring along the completed questionnaires. After providing written informed consent and being screened with respect to acute suicidality and self-harm behavior by an M.Sc.-level clinical psychologist, the body pictures were taken, and the participants' height and weight was measured. Prior to the following eye-tracking session, the participants were told the cover story that the study aimed to assess various measures such as spontaneous pupil dilation in response to particular stimuli, in order to prevent participants from deliberately controlling their gaze behavior (see Waldorf et al., 2019; Cordes et al., 2016). Participants were then assigned to one of the two conditions by throwing a die to determine whether they would view their own or the other person's body pictures first. Each photo set was shown twice, with participants' spontaneous gaze behavior being recorded during the first trial. During both trials, a centered fixation cross was displayed for 2000 msec, directly followed by the presentation of each body picture for 6000 msec. During the first trial, participants were asked to simply look at the body pictures, and during the second trial they were asked to examine the body pictures closely, as they would subsequently be asked to evaluate them. During this second trial, and directly after viewing one's own or the peer's body pictures, respectively, participants completed the body areas attractiveness ranking, the BISS, and the PANAS. Finally, the presence of a current mental disorder was checked using the Diagnostic Interview for Mental Disorders (Schneider & Margraf, 2011). Following the subsequent debriefing procedure, each participant received an expense allowance of 30 €. The study protocols were approved by the Ethics Committee of the Ruhr-University Bochum, Germany. The study was performed in accordance with the ethical standards of the Declaration of Helsinki.

Data Analysis

Prior to the data analysis, the eye-tracking data quality was checked following the guidelines provided by Holmqvist et al., (2011). Due to insufficient eye-tracking data quality, $n = 3$ women and $n = 5$ men were excluded from the analysis of the participants' gaze behavior towards one's own and the peer's body. The statistical analysis was performed using the software IBM SPSS (Version 26). Differences in sample characteristics regarding participants' age, BMI, physical activity, and mean EDE-Q subscale scores were analyzed using separate independent *t*-tests. Furthermore, participants' gaze behavior towards the specific AOIs and the attractiveness ratings concerning one's own and the peer's body were analyzed on a descriptive level. Gender differences in state body satisfaction (BISS), positive affect (PANAS-PA), and negative affect (PANAS-NA) after viewing the pictures of one's own and the peer's body were analyzed by conducting three separate 2×2 mixed-design ANOVAs with the between-subject factor Gender (women vs. men) and the within-subject factor Body (one's own vs. the peer's body). Participants' gaze behavior towards the subjectively attractive and unattractive body areas was analyzed using a $2 \times 2 \times 2$ mixed-design ANOVA with the between-subject factor Gender (women vs. men) and the two within-subject factors Body (one's own vs. the peer's body) and Attractiveness (subjectively attractive vs. unattractive body areas). In the case of significant interaction terms, the mixed-design ANOVAs were followed by simple effects analyses. Homogeneity of variances and equality of covariance matrices were tested using Levene's test or Box's test, respectively. If violated, this was reported, and post-hoc *t*-tests were conducted and interpreted only. Bonferroni correction was used to account for multiple comparisons. To quantify the effect sizes of the post-hoc *t*-tests, Hedges' g_s (between subjects) and Hedges' g_{av} (within subjects) were used, with g_s and $g_{av} = 0.20$ indicating a small effect, g_s and $g_{av} = 0.50$ indicating a medium effect, and g_s and $g_{av} = 0.80$ indicating a large effect (Lakens, 2013). With respect to violations of the assumption of normality, no adjustments or corrections were made, as the ANOVA is assumed to be robust to this kind of violation (e.g., Schmider et al., 2010). Moreover, the data were checked with respect to outliers. As only a few outliers emerged, which were not related to measurement or typing errors, these participants were not excluded from the respective analyses in order to maintain the full variance.

Results

Sample Characteristics

The sample characteristics including participants' age, BMI, number of hours of physical exercise per week, and the mean scores on the EDE-Q subscales are displayed in Table 1. Significant differences only emerged with respect to participants' BMI and mean scores on the *Restraint* subscale of the EDE-Q, in each case with women showing lower values than men. On all other variables, the participants had similar values (Table 1). In both groups, the educational level was comparatively high: $n = 14$ (34.2%) women and $n = 23$ (54.8%) men reported having a degree from a university or a university of applied sciences; $n = 12$ (29.3%) women and $n = 8$ (19.1%) men had university entrance-level qualifications or an advanced technical college certificate; and $n = 15$ (36.5%) women and $n = 10$ (23.8%) men had medium-track secondary school-leaving qualifications (missing data among men: $n = 1$, 2.4%). As indicated by the Diagnostic Interview for Mental Disorders (Schneider & Margraf, 2011), there was a comparable number of participants meeting the criteria for a current mental disorder in the two groups. Among women, these disorders included depressive disorder ($n = 1$, 2.4%), social phobia ($n = 1$, 2.4%), substance abuse ($n = 1$, 2.4%), and sexual dysfunctions ($n = 1$, 2.4%), and among men, they included depressive disorder ($n = 3$, 7.1%), social phobia ($n = 2$, 4.8%), and insomnia ($n = 2$, 4.8%). These participants were not excluded from further analyses.

State Body Satisfaction and Affect after Viewing One's Own and a Peer's Body.

Participants' BISS, PANAS-PA, and PANAS-NA scores assessed after the presentation of one's own or the peer's body pictures, respectively, are displayed in Table 2. The 2 × 2 mixed-design ANOVA on participants' BISS scores yielded a significant main effect of Body, $F(1, 81) = 22.61$, $p < .001$, $\eta_p^2 = 0.22$, and a significant interaction of Body × Gender, $F(1, 81) = 4.95$, $p = .029$, $\eta_p^2 = 0.06$. With respect to the factor Gender, simple effects analyses showed that women and men did not differ from each other regarding their state body satisfaction after viewing one's own ($p = .456$) or the peer's body ($p = .101$), respectively. However, when comparing body types, simple effects analyses indicated that women's state body satisfaction was significantly worse after viewing one's own body than after viewing the peer's body ($p < .001$), while no significant difference emerged for men ($p = .076$).

Table 2 State measures after viewing one's own and the peer's body

			Own body	Peer's body
		n	*M* (*SD*)	*M* (*SD*)
BISS	Women	41	3.39 (1.41)	2.96 (1.30)
	Men	42	3.63 (1.55)	3.48 (1.53)
PANAS - Positive	Women	41	2.35 (0.75)	2.23 (0.70)
	Men	42	2.07 (0.71)	1.92 (0.74)
PANAS - Negative	Women	41	1.40 (0.48)	1.15 (0.27)
	Men	42	1.39 (0.51)	1.19 (0.27)

Note. *M* = mean; *SD* = standard deviation; BISS = Body Image States Scale (0 = *very satisfied/attractive/much better*, 8 = *dissatisfied/unattractive/much worse*); PANAS = Positive and Negative Affect Schedule (1 = *not at all*, 5 = *extremely*).

With respect to participants' PANAS-PA scores, the 2 × 2 mixed-design ANOVA yielded a significant main effect of Body, $F(1, 81) = 9.40$, $p = .003$, $\eta_p^2 = 0.10$, indicating higher positive affect after viewing one's own body than after viewing the peer's body, irrespective of the factor Gender. Similarly, with regard to participants' PANAS-NA scores, the 2 × 2 mixed-design ANOVA indicated a significant main effect of Body, $F(1, 81) = 25.15$, $p < .001$, $\eta_p^2 = 0.24$, this time implying higher negative affect after looking at one's own body than after looking at the peer's body, irrespective of the factor Gender.

Table 1 Sample Characteristics

	Women (*n* = 41)		Men (*n* = 42)			
	n	*M* (*SD*)	*n*	*M* (*SD*)	*t*(df)	*p*
Age (years)	41	47.78 (4.52)	41	49.54 (4.28)	-1.81(80)	0.074
BMI (kg/m^2)	41	23.23 (3.68)	42	26.97 (3.86)	-4.51(81)	< 0.001
Exercise (hours/week)	41	2.88 (2.32)	41	3.26 (2.31)	-0.74(80)	0.461
EDE-Q						
Restraint	41	0.72 (0.98)	41	1.40 (1.37)	-2.60(72.69)	0.011
Eating Concern	41	0.25 (0.59)	41	0.23 (0.52)	0.20(80)	0.843
Weight Concern	41	0.86 (1.02)	41	1.23 (1.15)	-1.55(80)	0.126
Shape Concern	41	1.20 (1.16)	41	1.57 (1.36)	-1.33(80)	0.188

Note. *M* = mean; *SD* = standard deviation; BMI = Body Mass Index; EDE-Q = Eating Disorder Examination-Questionnaire (1 = *no days/not at all*, 6 = *every day/markedly*)

Body Areas Attractiveness Ranking and Attention Allocation to AOIs

In terms of one's own frontal body pictures, women ($n = 38$) most often rated the décolleté ($n = 21$, 55.3%), the forearms ($n = 18$, 47.4%), and the chest/hands (each $n = 17$, 44.7%) as the most attractive body areas, and the abdomen ($n = 30$, 78.9%), the thighs ($n = 28$, 73.7%), and the feet ($n = 17$, 44.7%) as the most unattractive ones. Similarly, with respect to the peer's frontal body pictures, they most frequently rated the décolleté ($n = 25$, 65.8%), the chest ($n = 19$, 50.0%), and the forearms ($n = 18$, 47.4%) as the most attractive body areas, and the abdomen ($n = 25$, 65.8%), the thighs ($n = 25$, 65.8%), and the feet ($n = 21$, 55.3%) as the most unattractive ones. Conversely, men ($n = 37$) most often rated the forearms ($n = 21$, 56.8%), the hands ($n = 18$, 48.6%), and the thighs ($n = 16$, 43.2%) as the most attractive areas of their own body, and the abdomen ($n = 32$, 86.5%), the feet ($n = 18$, 48.6%), and the chest ($n = 17$, 45.9%) as the most unattractive ones. Regarding the peer's frontal body pictures, men most frequently rated the hands ($n = 20$, 54.1%), the upper arms ($n = 18$, 48.6%), and the thighs ($n = 17$, 45.9%) as the most attractive body areas, and the abdomen ($n = 26$, 70.3%), the genital area ($n = 19$, 51.4%), and the chest ($n = 18$, 48.6%) as the most unattractive ones.

With respect to participants' fixation times on specific AOIs, it was found that women allocated the most visual attention to the abdomen, followed by the thighs, the chest, and the décolleté of their own body, and the abdomen, followed by the thighs, the décolleté, and the chest of the peer's body (Fig. 1). In contrast, the four AOIs receiving the most visual attention among the men were the abdomen, followed by the genital area, the chest, and the thighs of their own body, and the abdomen, followed by the chest, the genital area, and the thighs of the peer's body (Fig. 2).

Attention Allocation to Subjectively Attractive and Unattractive Body Areas

Participants' fixation times on the subjectively attractive and unattractive body areas of one's own and the peer's body are displayed in Fig. 1 and Fig. 2. The $2 \times 2 \times 2$ mixed-design ANOVA yielded a significant main effect of Attractiveness, $F(1, 73) = 117.54$, $p < .001$, $\eta_p^2 = 0.62$, indicating an attentional bias toward subjectively unattractive body areas, irrespective of the factor Body and in both genders. Furthermore, the main effect of Gender became significant, $F(1, 73) = 7.07$, $p = .010$, $\eta_p^2 = 0.09$, indicating generally longer fixation times in women than in men. As the Levene test indicated a violation of the assumption of homogeneity of variances regarding participants' fixation times on the peer's

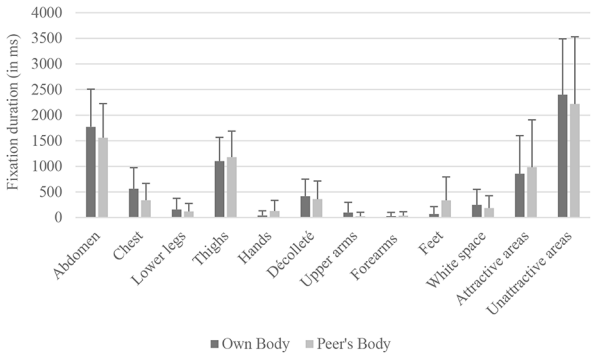

Fig. 1 *Fixation Times on Areas of Interest and the Three Subjectively Most Attractive and Most Unattractive Areas of One's Own and the Peer's Body in Women (n = 38)*

subjectively unattractive body areas ($p = .049$), additional post-hoc *t*-tests were conducted. In line with the above-mentioned main effect of Attractiveness, post-hoc paired samples *t*-tests indicated that both women and men showed significantly longer fixations on subjectively unattractive areas than on subjectively attractive areas, regardless of whether they looked at one's own body (women: $t(37) = -6.04$, $p < .001$, $g_{av} = 1.67$; men: $t(36) = -7.05$, $p < .001$, $g_{av} = 1.74$) or the peer's body (women: $t(37) = -3.80$, $p = .001$, $g_{av} = 1.09$; men: $t(36) = -5.79$, $p < .001$, $g_{av} = 1.50$). However, contrary to the above-mentioned main effect of Gender, post-hoc independent *t*-tests did not indicate significant gender differences, either regarding fixation times on subjectively attractive, $t(73) = 1.62$, $p = .111$, $g_s = 0.37$, or unattractive areas of one's body, $t(73) = 1.03$, $p = .309$, $g_s = 0.23$, or regarding fixation times on subjectively attractive, $t(73) = 1.20$, $p = .234$, $g_s = 0.27$, or unattractive areas of the peer's body, $t(66.85) = 1.00$, $p = .322$, $g_s = 0.23$.

Discussion

Body-related attentional biases are assumed to play a significant role in triggering and maintaining body-related concerns or clinically relevant psychopathology such as body image disturbance or eating disorders (Cordes et al., 2015; Williamson et al., 2004; Aspen et al., 2013). While previous research primarily focused on assessing women's or men's body-related attention patterns separately (for a review, see Cordes et al., 2015; Rodgers & DuBois, 2016), only a small number of studies have analyzed the existence of potential gender differences (see Cho & Lee 2013; Warschburger et al., 2015; Porras-Garcia et al., 2019). Little is known about gender differences in attentional biases towards subjectively attractive and unattractive body areas, and how these relate to potential gender differences in state body satisfaction and

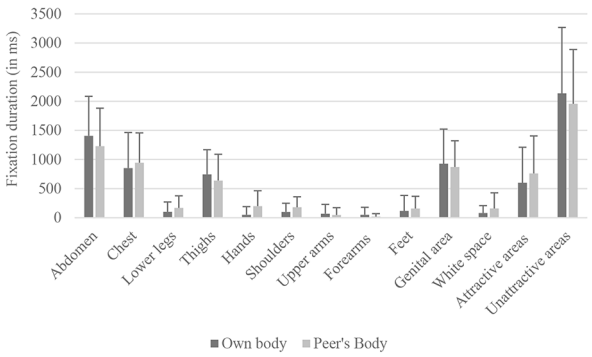

Fig. 2 *Fixation Times on Areas of Interest and the Three Subjectively Most Attractive and Most Unattractive Areas of One's Own and the Peer's Body in Men (n = 37)*

affect after body exposure. The present study thus aimed to analyze and compare women's and men's state body satisfaction and affect as well as attention patterns towards subjectively attractive and unattractive areas of one's own and a gender-matched peer's body by using an eye-tracking paradigm.

With regard to the analyses on potential gender differences in state affect and body satisfaction after viewing one's own and the peer's body, the present results are not in line with our hypotheses. Contrary to our expectations, women did not show worse state body satisfaction (hypothesis 1), lower positive affect (hypothesis 2), and higher negative affect (hypothesis 3) than men after looking at their own or a peer's body. Nevertheless, further analyses indicated that women displayed significantly worse state body satisfaction after viewing one's own body than after viewing the peer's body, while this difference was not significant for men. Given previous findings indicating that women perceive a higher sociocultural pressure to conform with a certain body ideal (e.g., Pritchard & Cramblitt 2014) and are more frequently exposed to idealized bodies compared to men (e.g., Buote et al., 2011), it seems reasonable that specifically for women, state body satisfaction was worse after viewing one's own body than after viewing the peer's body (e.g., as viewing one's own body was likely to have been confrontational in terms of supposed physical flaws).

Interestingly, we found that both women and men consistently had higher state positive affect and higher state negative affect after viewing one's own body than after viewing the peer's body. These findings suggest that looking at and evaluating one's own body was associated with both pleasant and unpleasant emotions for both women and men but that men did not experience lower state body satisfaction after viewing their own body than after viewing the peer's body, whereas women did. Considering that women and men were possibly confronted with subjectively unattractive areas of their own body while viewing the body pictures, the absence of a significant gender difference in state negative affect might be indicative of "normative" body-related discontent in both genders (e.g., Fallon et al., 2014; Tantleff-Dunn et al., 2011; see also Waldorf et al., 2019). On the other hand, it is also conceivable that the Negative Affect subscale of the PANAS does not exclusively measure body-related negative affect. Given that it also includes, for instance, items such as "confused" or "anxious", it might be influenced by aspects of the current situation as well (e.g., in this case, the laboratory assessment). Similarly, possible reasons why the results for state positive affect were not in line with our hypothesis (i.e., that women would show lower state positive affect as compared to men) might also be related to the measurement of state positive affect itself. When considering the individual items used to measure participants' state positive affect (e.g., "interested", "attentive", or "active"), the higher state positive affect after viewing one's own body than after viewing the peer's body may have emerged because one's own body might have higher subjective relevance in general. Consequently, the items of the Positive Affect subscale of the PANAS might not exclusively reflect body-related state positive affect. While this could explain why we found higher state positive affect after viewing one's own body than after viewing the peer's body in both genders, future eye-tracking studies might benefit from focusing exclusively on the assessment of affective states that are more directly related to body image (e.g., primarily including feelings of shame, disgust, and guilt) (see Waldorf et al., 2019).

Focusing on body-related attention patterns, the descriptive analysis of women's attention allocation to specific AOIs indicated a strong attention orientation towards the abdomen, the thighs, the chest, and the décolleté, which was widely independent of the presented body type (i.e., one's own or the peer's body). With respect to the abdomen and the thighs, these findings are consistent with the results of previous studies which also indicated an attentional bias towards weight-related body areas (e.g., encompassing the abdomen and the thighs) in samples of college-aged women (Porras-Garcia et al., 2019) and female adolescents with and without eating disorders (Horndasch et al., 2012). Furthermore, the descriptive analysis of the body areas attractiveness ranking showed that, in general, the abdomen and the thighs both were frequently rated as the most unattractive areas of one's own and the peer's body. This is also in line with previous findings by Tanck et al., (2019), which likewise revealed that the abdomen and the thighs were often perceived as unattractive. In turn, the chest and the décolleté were commonly rated as being the most attractive body areas of one's own and the peer's body. Consequently, it is conceivable that the abdomen, the thighs, the chest, and the

décolleté received a large amount of visual attention as they represent commonly salient body areas in women.

Among the male participants, largely irrespective of the presented body type (i.e., one's own or the peer's body), the most visual attention was displayed towards the abdomen, the genital area, the chest, and the thighs. These findings are in line with previous studies showing an attentive preference for the chest and the abdomen (Cordes et al., 2016; Porras-Garcia et al., 2020) and the genital area (Cordes et al., 2016) among male weight-training participants or men with high muscularity dissatisfaction. In the body areas attractiveness ranking, the abdomen, chest, and genital area were also frequently rated among the most unattractive body areas of one's own and/or the peer's body. These findings likewise correspond to previous studies indicating that men often perceive the abdomen and the chest as unattractive body areas (Tanck et al., 2019) and are frequently dissatisfied with aspects of the genital area (e.g., one's own penis size) (e.g., Lever et al., 2006). In turn, the body areas most frequently rated as among the most attractive body areas of one's own and/or the peer's body included the forearms, the upper arms, the hands, and the thighs, which also corresponds to the findings by Tanck et al., (2019). While the thighs of one's own and the peer's body also received a large amount of attention, less attention was paid to the forearms, the upper arms, and the hands.

Looking in greater detail at the gender differences and the relation between participants' fixation times on individually attractive and unattractive body areas of one's own and the peer's body, the present findings indicate first, a generalized deficit-oriented attention pattern across both genders (i.e., an attentional bias towards subjectively unattractive body areas, irrespective of the presented body type). Second, it was found that compared to men, women generally displayed longer fixation times, regardless of whether they looked at one's own or the peer's subjectively attractive or unattractive body areas. However, this latter effect did not become significant in post-hoc tests conducted separately for each variable. Conversely, the findings obtained from post-hoc tests comparing the fixation times on subjectively attractive and unattractive areas separately for one's own and the peer's body and for women and men, respectively, were in line with the above-mentioned finding of a generalized deficit-oriented attentional bias. Thus, in contrast to the fourth hypothesis, which stated that based on gender differences in body dissatisfaction (e.g., Fallon et al., 2014), appearance norms (e.g., Buote et al., 2011), and social comparison tendencies (e.g., Franzoi et al., 2012), women would show a non-self-serving attention pattern and men would show a balanced attention pattern, the present findings suggest that women and men do not differ in the way they inspect their own and a peer's body. Rather, the present findings indicate that women and men tend to show a similar attention pattern towards their own and a peer's body, in each case characterized by a strong deficit orientation. As such, this generalized deficit-oriented attention pattern might be explained by "normative" body-related discontent in both genders (e.g., Fallon et al., 2014; Tantleff-Dunn et al., 2011; Bauer et al., 2017a). However, the participants in the present study showed relatively low eating disorder symptomatology and weight- and shape-related concerns. Therefore, it might also be reasonable to assume that by looking critically at a peer's body too (i.e., by conducting a self-serving downward social comparison) (see Festinger 1954), women and men were able to reduce the potentially negative effects which may have emerged by inspecting their own body in deficit-oriented manner (also see Bauer et al., 2017a). Accordingly, future research should try to replicate the present findings and should explore whether looking critically at one's own, but also at a peer's body (i.e., showing a generalized deficit-oriented attention pattern) is associated with stabilizing effects on one's own body satisfaction, or alternatively, whether it is associated with elevated body-related concerns in the long run (see Cordes et al., 2015; Williamson et al., 2004). Further longitudinal and experimental studies are thus needed, as well as studies comparing participants with elevated eating disorder pathology and healthy controls.

Despite several strengths of the current study, such as the standardized methodological procedure, some limitations should also be addressed. First, while the sample size was quite large, especially given the complex methodological procedure used, small effects might still have remained undetected. Future research projects should therefore aim to replicate the present findings using larger samples. Second, the representativeness of the sample may be limited, for instance because the participants had a relatively high educational level. Consequently, the current findings might not be generalized to a broader population, and should thus be replicated in more diverse samples. Third, it should be noted that women and men differed with respect to restraint eating on the EDE-Q, with men showing slightly higher values than women. However, as participants displayed similar values in eating, weight, and shape concern, it is possible that this above-mentioned gender difference did not bias the presented results. Within this context, a fourth limitation refers to the fact that we did not assess muscularity-related body dissatisfaction, which might be especially relevant to men (e.g., Karazsia et al., 2017). Thus, future research should aim to include measures of muscularity-related body dissatisfaction in addition to measures of disordered eating pathology. A fifth limitation refers to the methodological procedure of assessing participants' eye movements based on a one-time presentation of one's own and the peer's

body. This procedure does not allow conclusions to be drawn about the stability of the body-related attention pattern. However, as the study primarily aimed to assess participants' spontaneous gaze behavior, this approach seems to be justified, as repeating the presentation of photo sets or including additional frontal body pictures (e.g., by integrating different body poses) would probably have facilitated habituation or fatigue effects (also see Bauer et al., 2017b). Sixth, the peer's body was not BMI- or weight-matched to the participants. Consequently, the peer's body might have been quite close to one's own body for some participants, while for others, there might have been larger differences (e.g., regarding one's own or the peer's body size, shape, or weight). This may have induced divergent attention patterns and reactions after viewing pictures of one's own and the peer's body. In future research, it might thus be useful to include a wider range of control bodies, which not only correspond to the average anthropometric data of an individual within a specific age group (e.g., as used in the present study) but also represent different BMI or weight categories, or idealized body types, respectively (also see Bauer et al., 2017b). Additionally, as participants were on average slightly older than the respective peer, future research might further benefit from presenting age-matched peers (e.g., to enhance the identification with the presented body pictures). Finally, a significant limitation of the present study is that state measures of body satisfaction and affect were not applied prior to the body picture presentation. Thus, changes in these state measures after participants had looked at the body pictures could not be measured. As this might be helpful for drawing conclusions about whether a deficit-oriented body-related attentional bias is associated with a decrease in state body satisfaction, future research should implement state measures before and after participants are presented with their own and/or a peer's body pictures.

With respect to clinical implications, the findings suggest that it might be useful to educate women and men about the potentially negative effects of dysfunctional body-related attention allocation. More specifically, preventive programs on body image disturbance and eating disorder pathology might benefit from the inclusion of didactic elements such as the proposed reciprocal association between deficit-oriented body-related attention allocation, body dissatisfaction, negative body-related feelings, and the use of compensatory behavior (see, for instance, Cordes et al., 2015; Williamson et al., 2004; Aspen et al., 2013). In view of previous findings showing that training body-dissatisfied women to direct their attention towards their own subjectively attractive body areas is associated with an increase in state (Smeets et al., 2011) and trait body satisfaction (Jansen et al., 2016), preventive programs could further benefit from including interventions which aim to establish a functional viewing pattern towards one's own body. Finally, when relating the present findings on state body satisfaction to sociocultural models of body dissatisfaction (Thompson et al., 1999), and given previous findings that women might still experience a higher sociocultural pressure to comply with specific appearance norms (e.g., Buote et al., 2011), preventive programs further should inform women and men about the potentially negative effects of appearance-related sociocultural pressure on body dissatisfaction (see, for instance, Johnson et al., 2015).

In conclusion, the present study provides evidence of gender-specific differences in state body satisfaction after viewing one's own and a peer's body. Specifically, women, but not men, showed worse state body satisfaction after looking at their own body than after looking at the peer's body. However, this gender difference was not reflected by gender-specific body-related attention patterns, as both women and men showed a generalized deficit-oriented attentional bias towards their own and the respective peer's body. As such, this finding might be related to a widespread or even "normative" body-related discontent in women and men (e.g., Fallon et al., 2014; Tantleff-Dunn et al., 2011; Bauer et al., 2017a). Considering the rather inconsistent findings for state affect (i.e., that both women and men showed higher state positive and higher state negative affect after viewing their own body than after viewing the peer's body), future research might benefit from assessing affective states that are more clearly related to body image.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethics Approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of the Ruhr-University Bochum, Germany.

Consent to participate Written informed consent was obtained from all individual participants included in the study.

References

Aspen, V., Darcy, A. M., & Lock, J. (2013). A review of attention biases in women with eating disorders. *Cognition and Emotion*, 27, 820–838. https://doi.org/10.1080/02699931.2012.749777

Arkenau, R., Bauer, A., Schneider, S., & Vocks, S. (2022) Familial transmission of attention allocation towards one's own and a peer's body: An eye-tracking study with male adolescents and their fathers. *PLOS ONE*, 17(1), e0263223. https://doi.org/10.1371/journal.pone.0263223

Bauer, A., Schneider, S., Waldorf, M., Adolph, D., & Vocks, S. (2017a). Familial transmission of a body-related attentional bias – An eye-tracking study in a nonclinical sample of female adolescents and their mothers. *PLoS ONE*, 12, e0188186. https://doi.org/10.1371/journal.pone.0188186

Bauer, A., Schneider, S., Waldorf, M., Braks, K., Huber, T. J., Adolph, D., et al. (2017b). Selective visual attention towards oneself and associated state body satisfaction: An eye-tracking study in adolescents with different types of eating disorders. *Journal of Abnormal Child Psychology*, 45, 1647–1661. https://doi.org/10.1007/s10802-017-0263-z

Bauer, A., Schneider, S., Waldorf, M., Cordes, M., Huber, T. J., Braks, K., et al. (2017c). Visual processing of one's own body over the course of time: Evidence for the vigilance-avoidance theory in adolescents with anorexia nervosa? *International Journal of Eating Disorders*, 50, 1205–1213. https://doi.org/10.1002/eat.22771

Buote, V. M., Wilson, A. E., Strahan, E. J., Gazzola, S. B., & Papps, F. (2011). Setting the bar: Divergent sociocultural norms for women's and men's ideal appearance in real-world contexts. *Body Image*, 8, 322–334. https://doi.org/10.1016/j.bodyim.2011.06.002

Cash, T. F., Fleming, E. C., Alindogan, J., Steadman, L., & Whitehead, A. (2002). Beyond body image as a trait: The development and validation of the Body Image States Scale. *Eating Disorders*, 10, 103–113. https://doi.org/10.1080/10640260290081678

Cho, A., & Lee, J. H. (2013). Body dissatisfaction levels and gender differences in attentional biases toward idealized bodies. *Body Image*, 10, 95–102. https://doi.org/10.1016/j.bodyim.2012.09.005

Cordes, M., Bauer, A., Waldorf, M., & Vocks, S. (2015). Körperbezogene Aufmerksamkeitsverzerrungen bei Frauen und Männern. *Psychotherapeut*, 60, 477–487. https://doi.org/10.1007/s00278-015-0058-z

Cordes, M., Vocks, S., Düsing, R., Bauer, A., & Waldorf, M. (2016). Male body image and visual attention towards oneself and other men. *Psychology of Men & Masculinity*, 17, 243–254. https://doi.org/10.1037/men0000029

Destasis (2018). Mikrozensus - Fragen zur Gesundheit - Körpermaße der Bevölkerung. https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Gesundheit/Gesundheitszustand-Relevantes-Verhalten/Publikationen/Downloads-Gesundheitszustand/koerpermasse-5239003179004.html

Dilling, H., Mombour, W., & Schmidt, M. H. (2015). *Internationale Klassifikation Psychischer Störungen. ICD-10 Kapitel V (F). Klinisch-diagnostische Leitlinien. 10., überarbeitete Auflage.* Hogrefe

Fairburn, C. G., & Beglin, S. J. (1994). The assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders*, 16, 363–370

Fallon, E. A., Harris, B. S., & Johnson, P. (2014). Prevalence of body dissatisfaction among a United States adult sample. *Eating Behaviors*, 15, 151–158. https://doi.org/10.1016/j.eatbeh.2013.11.007

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7, 117–140. https://doi.org/10.1177/001872675400700202

Franzoi, S. L., Vasquez, K., Sparapani, E., Frost, K., Martin, J., & Aebly, M. (2012). Exploring body comparison tendencies: Women are self-critical whereas men are self-hopeful. *Psychology of Women Quarterly*, 36, 99–109. https://doi.org/10.1177/0361684311427028

Frederick, D. A., Peplau, L. A., & Lever, J. (2006). The swimsuit issue: Correlates of body image in a sample of 52,677 heterosexual adults. *Body Image*, 3, 413–419. https://doi.org/10.1016/j.bodyim.2006.08.002

Hartmann, A. S., Steenbergen, F., Vocks, S., Büsch, D., & Waldorf, M. (2018). How healthy is a desire to be fit and strong? Drives for thinness, leanness, and muscularity in women in weight training. *Journal of Clinical Sport Psychology*, 12, 544–561. https://doi.org/10.1123/jcsp.2018-0022

Haynos, A. F., Wall, M. M., Chen, C., Wang, S. B., Loth, K., & Neumark-Sztainer, D. (2018). Patterns of weight control behavior persisting beyond young adulthood: Results from a 15-year longitudinal study. *International Journal of Eating Disorders*, 51, 1090–1097. https://doi.org/10.1002/eat.22963

Hilbert, A., & Tuschen-Caffier, B. (2016). *Eating Disorder Examination-Questionnaire: Deutschsprachige Übersetzung. 2. Auflage*. DGVT-Verlag

Holmqvist, K., Nyström, M., Andersson, R., Dewhurst, R., Jarodzka, H., & van de Weijer, J. (2011). *Eye tracking. A comprehensive guide to methods and measures*. Oxford University Press

Horndasch, S., Kratz, O., Holczinger, A., Heinrich, H., Hönig, F., Nöth, E., et al. (2012). 'Looks do matter'—Visual attentional biases in adolescent girls with eating disorders viewing body images. *Psychiatry Research*, 198, 321–323. https://doi.org/10.1016/j.psychres.2011.12.029

Jansen, A., Nederkoorn, C., & Mulkens, S. (2005). Selective visual attention for ugly and beautiful body parts in eating disorders. *Behviour Research and Therapy*, 43, 183–196. https://doi.org/10.1016/j.brat.2004.01.003

Jansen, A., Voorwinde, V., Hoebink, Y., Rekkers, M., Martijn, C., & Mulkens, S. (2016). Mirror exposure to increase body satisfaction: Should we guide the focus of attention towards positively or negatively evaluated body parts? *Journal of Behavior Therapy and Experimental Psychiatry*, 50, 90–96. https://doi.org/10.1016/j.jbtep.2015.06.002

Johnson, S. M., Edwards, K. M., & Gidycz, C. A. (2015). Interpersonal weight-related pressure and disordered eating in college women: A test of an expanded tripartite influence model. *Sex Roles*, 72, 15–24. https://doi.org/10.1007/s11199-014-0442-0

Karazsia, B. T., Murnen, S. K., & Tylka, T. L. (2017). Is body dissatisfaction changing across time? A cross-temporal meta-analysis. *Psychological Bulletin*, 143, 293–320. https://doi.org/10.1037/bul0000081

Krohne, H. W., Egloff, B., Kohlmann, C., & Tausch, A. (1996). Untersuchungen mit einer deutschen Version der "Positive and Negative Affect Schedule" (PANAS). *Diagnostica*, 42, 139–156

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for t-tests and ANOVAs. *Frontiers in Psychology*, 4, 863. https://doi.org/10.3389/fpsyg.2013.00863

Lemon, S. C., Rosal, M. C., Zapka, J., Borg, A., & Andersen, V. (2009). Contributions of weight perceptions to weight loss attempts:

Differences by body mass index and gender. *Body Imgae*, 6, 90–96. https://doi.org/10.1016/j.bodyim.2008.11.004

Lever, J., Frederick, D. A., & Peplau, L. A. (2006). Does size matter? Men's and women's views on penis size across the lifespan. *Psychology of Men & Masculinity*, 7, 129–143. https://doi.org/10.1037/1524-9220.7.3.129

Matthiasdottir, E., Jonsson, S. H., & Kristjansson, A. L. (2012). Body weight dissatisfaction in the Icelandic adult population: a normative discontent? *European Journal of Public Health*, 22, 116–121. https://doi.org/10.1093/eurpub/ckq178

McCabe, M. P., & James, T. (2009). Strategies to change body shape among men and women who attend fitness centers. *Asia-Pacific Journal of Public Health*, 21, 268–278. https://doi.org/10.1177/1010539509335498

Paxton, S. J., Neumark-Sztainer, D., Hannan, P. J., & Eisenberg, M. E. (2006). Body dissatisfaction prospectively predicts depressive mood and low self-esteem in adolescent girls and boys. *Journal of Clinical Child & Adolescent Psychology*, 35, 539–549. https://doi.org/10.1207/s15374424jccp3504_5

Porras-Garcia, B., Ferrer-Garcia, M., Ghita, A., Moreno, M., López-Jiménez, L., Vallvé-Romeu, A., et al. (2019). The influence of gender and body dissatisfaction on body-related attentional bias: An eye-tracking and virtual reality study. *International Journal of Eating Disorders*, 52, 1181–1190. https://doi.org/10.1002/eat.23136

Porras-Garcia, B., Exposito-Sanz, E., Ferrer-Garcia, M., Castillero-Mimenza, O., & Gutiérrez-Maldonado, J. (2020). Body-related attentional bias among men with high and low muscularity dissatisfaction. *Journal of Clinical Medicine*, 9, 1736. https://doi.org/10.3390/jcm9061736

Pritchard, M., & Cramblitt, B. (2014). Media influence on drive for thinness and drive for muscularity. *Sex Roles*, 71, 208–218. https://doi.org/10.1007/s11199-014-0397-1

Quittkat, H. L., Hartmann, A. S., Düsing, R., Buhlmann, U., & Vocks, S. (2019). Body dissatisfaction, importance of appearance, and body appreciation in men and women over the lifespan. *Frontiers in Psychiatry*, 10, 864. https://doi.org/10.3389/fpsyt.2019.00864

Rodgers, R. F., Paxton, S. J., & Chabrol, H. (2009). Effects of parental comments on body dissatisfaction and eating disturbance in young adults: A sociocultural model. *Body Image*, 6, 171–177. https://doi.org/10.1016/j.bodyim.2009.04.004

Rodgers, R. F., & DuBois, R. H. (2016). Cognitive biases to appearance-related stimuli in body dissatisfaction: A systematic review. *Clinical Psychology Review*, 46, 1–11. https://doi.org/10.1016/j.cpr.2016.04.006

Roefs, A., Jansen, A., Moresi, S., Willems, P., van Grootel, S., & van der Borgh, A. (2008). Looking good. BMI, attractiveness bias and visual attention. *Appetite*, 51, 552–555. https://doi.org/10.1016/j.appet.2008.04.008

Saß, H., Wittchen, H. U., Zaudig, M., & Houben, I. (2003). *Diagnostisches und Statistisches Manual Psychischer Störungen. Textrevision. DSM-IV-TR*. Hogrefe

Schmider, E., Ziegler, M., Danay, E., Beyer, L., & Bühner, M. (2010). Is it really robust? Reinvestigating the robustness of ANOVA against violations of the normal distribution assumption. *Methodology*, 6, 147–151. https://doi.org/10.1027/1614-2241/a000016

Schneider, S., & Margraf, J. (2011). *DIPS: Diagnostisches Interview bei psychischen Störungen*. Springer

Sharpe, H., Griffiths, S., Choo, T. H., Eisenberg, M. E., Mitchison, D., Wall, M., et al. (2018). The relative importance of dissatisfaction, overvaluation and preoccupation with weight and shape for predicting onset of disordered eating behaviors and depressive symptoms over 15 years. *International Journal of Eating Disorders*, 51, 1168–1175. https://doi.org/10.1002/eat.22936

Smeets, E., Jansen, A., & Roefs, A. (2011). Bias for the (un)attractive self: On the Role of attention in causing body (dis)satisfaction. *Health Psychology*, 30, 360–367. https://doi.org/10.1037/a0022095

Tanck, J. A., Vocks, S., Riesselmann, B., & Waldorf, M. (2019). Gender differences in affective and evaluative responses to experimentally induced body checking of positively and negatively valenced body parts. *Frontiers in Psychology*, 10, 1058. https://doi.org/10.3389/fpsyg.2019.01058

Tantleff-Dunn, S., Barnes, R. D., & Gokee Larose, J. (2011). It's not just a "woman thing:" The current state of normative discontent. *Eating Disorders*, 19, 392–402. https://doi.org/10.1080/10640266.2011.609088

Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance*. American Psychological Association. https://doi.org/10.1037/10312-000

Tuschen-Caffier, B., Bender, C., Caffier, D., Klenner, K., Braks, K., & Svaldi, J. (2015). Selective visual attention during mirror exposure in anorexia and bulimia nervosa. *PLoS ONE*, 10, e0145886. https://doi.org/10.1371/journal.pone.0145886

Vocks, S., Legenbauer, T., & Heil, A. (2007). Food intake affects state body image: Impact of restrained eating patterns and concerns about eating, weight and shape. *Appetite*, 49, 467–475. https://doi.org/10.1016/j.appet.2007.03.006

Voges, M. M., Giabbiconi, C. M., Schöne, B., Waldorf, M., Hartmann, A. S., & Vocks, S. (2019). Gender differences in body evaluation: Do men show more self-serving double standards than women? *Frontiers in Psychology*, 10, 544. https://doi.org/10.3389/fpsyg.2019.00544

Waldorf, M., Vocks, S., Düsing, R., Bauer, A., & Cordes, M. (2019). Body-oriented gaze behaviors in men with muscle dysmorphia diagnoses. *Journal of Abnormal Psychology*, 128, 140–150. https://doi.org/10.1037/abn0000403

Walker, C. D., Anderson, D. A., & Hildebrandt, T. (2009). Body checking behaviors in men. *Body Image*, 6, 164–170. https://doi.org/10.1016/j.bodyim.2009.05.001

Warschburger, P., Calvano, C., Richter, E. M., & Engbert, R. (2015). Analysis of attentional bias towards attractive and unattractive body regions among overweight males and females: An eye-movement study. *PLoS ONE*, 10, e0140813. https://doi.org/10.1371/journal.pone.0140813

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070. https://doi.org/10.1037/0022-3514.54.6.1063

Wei, B., Klimek, P., Pennesi, J. L., & Blashill, A. J. (2021). Perceptual and attitudinal body image, disordered eating, and muscle-building behavior in college men. *Psychology of Men & Masculinities*, 22, 156–165. https://doi.org/10.1037/men0000290

Williamson, D. A., White, M. A., York-Crowe, E., & Stewart, T. M. (2004). Cognitive-behavioral theories of eating disorders. *Behavior Modification*, 28, 711–738. https://doi.org/10.1177/0145445503259853