Korean Journal of Clinical Psychology
2023. Vol. 42, No. 3, 73-81
OPEN ACCESS

Original Article

https://doi.org/10.15842/kjcp.2023.42.3.003
eISSN 2733-4538

The Study of Self-Deprecating Bias towards Own Bodies in Individuals with Body Dissatisfaction

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This study investigated whether women with high levels of body dissatisfaction (BD) have a self-deprecating bias towards bodies when evaluating bodies presented with their own or another woman's faces. Overall, 382 undergraduate students completed the Eating Disorder Inventory-2. According to the upper and lower 15th percentile, the participants were categorized into high BD ($n=26$) and low BD ($n=27$) groups. The participants were shown pictures demonstrating the characteristics of their own, thin, average, fat, and muscular bodies with their own faces and the face of another woman. Gaze duration was measured using an eye-tracking system. In addition, all the participants were asked to rate their body attractiveness, emotional arousal, valence, body fat, and muscle mass using PsychoPy. The results showed that both groups gazed at their own and thin bodies longer than the low BD group when their own face was presented rather than with another woman's face. Particularly, the high BD group rated their own bodies as less attractive, while rating thin bodes as more attractive than to the low BD group. This suggests that individuals with high BD have a self-deprecating bias toward their own bodies because of the double standards applied to themselves and others in the process of evaluation.

Keywords: body dissatisfaction, double standard, body image, attentional bias, self-deprecation

Introduction

Body dissatisfaction (BD) is defined as a person's negative thoughts and feelings toward his/her body. BD is enhanced when one compares attractive others' and unattractive own bodies. Essentially, women with high levels of BD often experience discrepancies between their own bodies and an idealized female body (Cho & Lee, 2013). This leads to body dissatisfaction because the ideal is unrealistic and unattainable (Grossbard et al., 2011; Peterson, 2007). BD is an important risk factor for the development and maintenance of eating disorders (ED; Grogan, 2016; Jacobi et al., 2004; Kearney-Cooke & Tieger, 2015; Thompson et al., 1999). It is widespread among women with and without ED (Coker & Abraham, 2014), especially female university students compared to their male counterparts (Keski-Rahkonen & Mustelin, 2016; Karazsia et al., 2017).

It has been suggested that BD surfaces when individuals fail to meet physical appearance standards in one or more social or personal situations (Cash et al., 2004; Riva, 2014; Yamamotova et al., 2017). People compare themselves with others in various self-evaluation dimensions. Social media conveys that a thin body is ideal for women, which is internalized in Western societies (Dittmar et al., 2000; Crossley et al., 2012). This is in line with the social comparison theory, which suggests that people determine their self-worth based on how they collocate against others (Festinger, 1954).

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Received Jan 14, 2023; Revised May 4, 2023; Accepted May 17, 2023

*This research was supported by Basic Science Research Program through the National Research Foundation of Korea(NRF) funded by the Ministry of Education, Science and Technology(No. 2015R1D1A1A09061029) and the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (NRF-2017S1A5B4055761).

Individuals with BD may exhibit a tendency to perceive others' bodies as attractive and their bodies as unattractive; they may also have a different evaluation strategy under two conditions: oneself and others. For example, individuals with BD tend to assign relatively greater attention to thin-idealized bodies and unattractive body parts of their own body, which increases the perceived attractiveness of the object in comparison and unattractiveness of their own bodies (Cho & Lee, 2013). Women with symptomatic ED and low self-rated attractiveness paid longer attention to their unattractive body parts and others' attractive body parts (Jansen et al., 2005; Roefs et al., 2008).

Self-related body stimuli activate different body schemas than other-related body stimuli, leading to different ratings of these body stimuli. This is in line with the body image theory, which suggests that the overestimation of body size is conceptualized as a cognitive bias that stems from a self-schema (Voges et al., 2019; Williamson et al., 2004). This could be explained by double standards (DS), which are observable when two elements that objectively possess the same attributes are evaluated differently depending on the element at stake (Foschi, 2000). For example, in the general population, when presenting only overweight bodies with their own faces, they were evaluated as having high body fat, low muscle mass, and unattractiveness (Voges et al., 2019). It seems fair to evaluate a body that is different from one's own (Voges et al., 2018). In addition, people with ED rate their own bodies critically than nonclinical controls (Bauer et al., 2017; Horndasch et al., 2015). They demonstrated more pronounced self-deprecating DS across body types.

Self-report rating scales were used to reveal double standards for body images, and BD was strongly correlated with self-deprecating DS about the average-weight body in terms of attractiveness, valence, and muscle mass (Voges et al., 2018). However, the mechanism through which DS may increases BD remains unclear. To understand the relationship between DS and BD before identifying this mechanism, it is important to measure attractiveness, emotional arousal, valence, body fat, and muscle mass as self-reports with attentional bias toward bodies. Studies of body image among individuals with body dissatisfaction have either used body stimuli without faces or presented only participants' actual bodies (Cho & Lee, 2013; Gao et al., 2013; Roef et al., 2008; Smeets et al., 2011). However, to distinguish oneself from others and to reveal the mechanism between BD and DS, it is important to recognize that the body image stimuli are one's own when studying the DS of body image. It is necessary to use body stimuli that are similar to participants' bodies, although it has been assumed in previous studies that average-weight bodies would be recognized as their own bodies (Voges et al., 2018; 2019). In the present study, the participants were asked to choose a body stimulus similar to their own body shape before experimental trials. After selecting their own body type, the following five body types were organized for body image stimuli: Own, Thin, Average-weight, Fat, and Muscular.

Considering the methodological limitations of previous studies that employed visual search and dot-probe paradigms (Dobson & Dozois, 2004; Lee & Shafran, 2004; Rosser et al., 2010; Smeets et al., 2008), which provide only discontinuous snapshots of responses (Hermans et al., 1999), this study used the eye-tracking technology, which is a non-invasive tool that provides an appropriate and direct measure of abnormal attention. This technology helps to continually measure visuo-spatial attention processing (Mogg et al., 2000). Therefore, the present study aimed to investigate how the attentional patterns in body images can be explained by double standards using an eye-tracking system and self-report rating questionnaires, according to body dissatisfaction levels.

The study investigates whether women with high levels of dissatisfaction have a self-deprecating attentional bias toward their bodies under two conditions: with their own faces and with another woman's face. It is expected that the higher body dissatisfaction (high BD) group would exhibit a greater attentional bias towards their own and thin bodies presented with their own faces than with another face. Compared with the low BD group, the high BD group would also report their own body with their own faces as less attractive than with another face.

Methods

Participants

Overall, 382 adults completed the body dissatisfaction subscales of Eating Disorder Inventory-2 (EDI-2). All the participants were female university students aged 18-30. They were recruited from bulletins with QR cords and online bulletin boards at universities

https://doi.org/10.15842/kjcp.2023.42.3.003

in Seoul, South Korea. According to a previous study (Cho & Lee, 2013), on the body dissatisfaction subscale of EDI-2, a mean score above 4.778 was classified as high level of body dissatisfaction (>1 standard deviation; [SD] from mean score) and a mean score below 2.667 as low level of body dissatisfaction (<1 SD from the mean score). The participants were screened according to the total points on the subscales of EDI-2 and then divided into two groups: High Body Dissatisfaction (high BD; upper 15%) and Low Body Dissatisfaction (low BD; lower 15%) to compare between groups using rigorous criteria. Finally, 58 participants were included, 29 each for the High BD and Low BD groups. All participants signed an informed consent form before participating in the experiment. The study was approved by the Institutional Review Board (No. 1041078-201910-H***-323-01).

Materials

Body dissatisfaction subscale of Eating Disorder Inventory–2 (EDI–2)

The EDI-2 (Gardner, 1991), especially the body dissatisfaction subscale, was used to screen participants. This includes nine items assessing the belief that certain body parts (e.g., hips, thighs, and stomach) are too large and measuring the level of dissatisfaction for overall body shape. Items were rated on a 6-point scale ranging from 1 = *never true of me* to 6 = *always true of me*. Cronbach's alpha for the body dissatisfaction subscale of EDI-2 in the Korean version of the present study was .960.

State–Trait Anxiety Inventory (STAI)

The STAI (Spielberger et al., 1983) includes 20 items on state anxiety (STAI-S) and trait anxiety (STAI-T). In the present study, the Korean version of STAI (Kim & Shin, 1978) was used. The STAI is measured to avoid differences in the level of anxiety between groups and to control as an extraneous variable in this study. Cronbach's alpha was .966 (STAI-S) and .907 (STAI-T).

Rating for body stimuli using PsychoPy

Using a 9-point Likert scale, participants assessed body attractiveness, emotional arousal, valence, body fat, and muscle mass for body stimuli with either the participant's or another woman's face. All participants were asked to rate body stimuli in the following five categories: body attractiveness (1 = *very unattractive;* 9 = *very attractive),* emotional arousal (1 = *very calm*; 9 = *very arousing*), valence (1 = *very negative*; 9 = *very positive*), body fat, and muscle. To evaluate the consistency of the pictures, participants were asked to evaluate how coherent the body images looked overall; that is, how well the bodies and heads matched.

Body Mass Index (BMI)

To measure obesity, the participants were asked to report their height and weight. BMI was calculated as weight divided by height squared.

Body Dissatisfaction and Mood Visual Analogue Scale (VAS)

VAS was used to assess changes in the level of subjective feelings before and after the experiment, which consisted of a 100 mm horizontal line ranging from 0 (*very satisfied*) to 100.

Apparatus

Body images were presented on a desktop PC, and the monitor was 23-inch wide with a distance of 60-75 cm between the eyes and the monitor. A 3D program, DAZ studio 4.6 (DAZ Productions, Inc., USA), was used to construct body images for us as eye-tracking stimuli. Eye movements of the participants were recorded using a computerized eye-tracking system (Tobii TX300; Tobii Technology AB, Sweden). Body image ratings were measured using PsychoPy version 2 based on Python (Peirce, 2008). These stimuli were presented on a monitor for three seconds, in accordance with previous studies (Cho & Lee, 2013; Voges et al., 2019; 2018).

Body stimuli

Four types of female bodies (thin, average-weight, fat, and muscular) were constructed using the DAZ studio 4.6. The females were clad in a sports bra and hot pants. In addition, eight types of body images were created according to BMI levels (e.g., 10, 15, and 45) for participants to choose a body type similar to their actual self. Each body type had five different poses, resulting in 25 images each. Prior to the experiment, female students who were not participants rated each image on a 6-point overall body shape scale (1 = *extremely thin*; 6 = *extremely fat*) and mood scale (1 = *negative*; 6 = *positive*). Prior to the study, all the participants were asked

to provide a photo of their face with a neutral expression to create experimental stimuli. The other female face was an averagely attractive face from the Extended ChaeLee Korean Facial Expression of Emotions (Lee et al., 2013). It was also rated for each facial image on a 6-point emotional scale (1 = *very calm*; 6 = *very arousing*), valence (1 = *very negative*; 6 = *very positive*), and facial attractiveness (1 = *very unattractive*; 9 = *very attractive*) in the pre-experiment by female students who were not participants in this study for comparison with participants' faces. Finally, 20 body stimuli (4 poses × 5 body types) were created with the participant's face and 20 body stimuli identical to the other woman's face in a 1,920 × 1,080 pixel format.

Procedure

All the participants performed the experiment in a similar manner. First, they reported their level of BD and mood on VAS, and completed the affect scale questionnaires on paper. Subsequently, when in front of the computer monitor, the participants were instructed as follow: "Two images will appear few seconds after presenting the '+' mark. When the '+' mark appears, focus on the '+'. Then watch the screen freely as if you were looking through a magazine or watching television. Do not talk and move your head during the experimental trials." In this eye-tracking task, after each trial started with a central cross-fixation ('+' mark) for 1,000 ms, it is replaced by a pair of body images for 3,500 ms. Each trial included own (which was chosen similar to the participant's body shape), thin, average-weight, fat, and muscular bodies with the same pose and facial type randomly. A total of 48 trials, including two practice trials, were conducted (Figure 1). All gaze durations for the body images were recorded in milliseconds. After completing the eye-tracking experiment, the participants were asked to respond to the rating scales for body attractiveness, emotional arousal, valence, body fat, and muscle mass after a body picture was presented for three seconds. Forty body pictures were presented successively, not a pairs, in a random order. The participants were asked to rate only the bodies, not the faces, to reduce the possibility of bias. Body images and rating questionnaires were provided using the experimental software PsychoPy version 2.0, based on Python (Peirce, 2008). After the rating, they reported the level of their body satisfaction and mood on the VAS once more on paper.

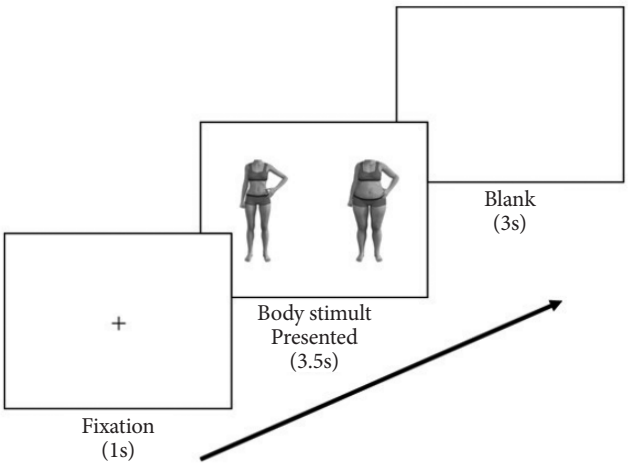

Figure 1. *Examples of body image usage free viewing task using eye-tracker.*

Data Analysis

All statistical analyses were performed using SPSS 25.0, for Windows. A 2 (group: high BD, low BD) × 2 (face: self, other) × 5 (build type: own, thin, average-weight, fat, muscular) mixed ANOVA was used to assess the differences in gaze duration and ratings of attractiveness, emotional arousal, valence, body fat, and muscle mass, according to body dissatisfaction levels. In addition, a 2 (groups: high BD, low BD) × 2 (condition: pre, post-experiment) mixed ANOVA was performed to assess body satisfaction and emotional changes. The DS-score was calculated for each body type to assess the scale of DS. Specifically, the differences between the rating scores for attractiveness, emotional arousal, valence, body fat, and muscle mass of the bodies between the participant's and other woman's faces were evaluated. A positive difference between these rating scores indicates a higher value of the dependent variable for the former than for the latter body. Independent *t*-tests were performed to examine differences in the questionnaires between the groups. Bonferroni post-hoc tests and independent sample *t*-tests were conduct to determine significant interactions and main effects.

Results

Group Characteristics

Table 1 shows the mean and standard deviation of the self-report questionnaires for high BD and low BD in the present study. Inde-

https://doi.org/10.15842/kjcp.2023.42.3.003

Table 1. *Means (Standard Deviations) of the Demographic Characteristic*

	High BD (n = 26)	Low BD (n = 27)	t
Age (yr)	21.8 (2.4)	21.6 (2.5)	0.4
BD subscales of EDI-2	5.0 (0.3)	2.1 (0.4)	29.4*
BMI	24.8 (4.1)	19.0 (1.7)	6.7*
STAI-T	54.3 (10.3)	40.8 (9.0)	5.1*
STAI-S			
Pre-experiment	53.1 (10.8)	38.0 (8.8)	5.6*
Post-experiment	51.1 (12.7)	38.3 (12.4)	3.7*

Note. high BD = the high levels of body dissatisfaction; low BD = the low levels of body dissatisfaction; yr = year; BMI = the Body Mass Index; STAI-T = State Trait Anxiety Inventory-Trait; STAI-S = State Trait Anxiety Inventory-State; EDI-2 = Eating Disorder Inventory-2.
**p < .01.*

pendent *t*-tests were conducted for age, mean body dissatisfaction, BMI, STAI-T, and pre- and post-STAI-S scores. The two groups did not differ significantly in age, body satisfaction, and mood change, $t(51) = 0.432$, *n.s.* There was a significant difference in the body dissatisfaction subscale of EDI-2 between the high BD and low BD groups, $t(51) = 29.413$, $p < .001$. This indicates that the participants were well classified into groups using the EDI-2 subscale, without any differences in basic demographic factors. In addition, the two groups differed significantly in BMI, STAI-T, and STAI-S scores before and after the experiment, $t(33.216) = 6.715$, $p < .001$; $t(51) = 5.087$, $p < .001$; $t(51) = 5.596$, $p < .001$; $t(51) = 3.697$, $p = .001$. Therefore, the low BD group had significantly fewer anxiety problems than the high BD group. Excluded due to data input errors, the final number of participants was 53 (high BD = 26, low BD = 27) for teye-movement statistical analysis.

Attentional Bias Toward Body Stimuli

A 2 (face: self, other) × 5 (build type: own, thin, average-weight, fat, muscular) mixed ANOVA showed a significant interaction, $F(1, 204) = 14.093$, $p < .001$, $\eta^2 = .217$. The results of the post-hoc test revealed a significant difference in the own, thin, and average-weight bodies when presented with one's own face compared to another woman's face, $t(52) = 5.298$, $p < .001$; $t(52)$ 7.532, $p < .001$; $t(52) = 8.460$, $p < .001$. These results showed that the participants gazed at their own, thin, and average-weight bodies significantly longer when they were presented with their own face than with another woman's face. This is consistent with our hypothesis that

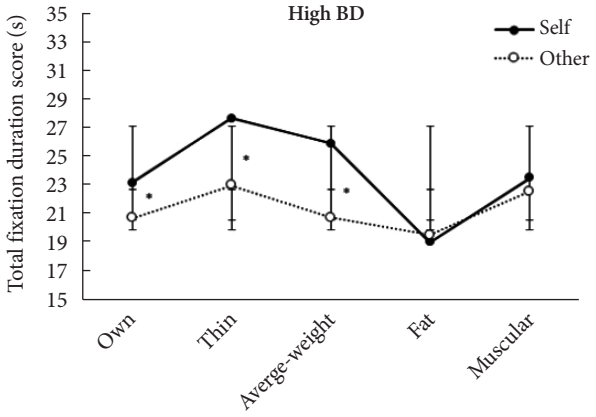

Figure 2. *Comparison of total fixation duration between faces (self, other) toward 5-type of bodies in high BD. Error bars represent standard error of the mean (*p < .05).*

Table 2. *Mean (SD) of Eye-Movement, Body Satisfaction, and Mood Changes*

	High BD (n = 26)	Low BD (n = 27)	F
Gaze duration (s) – self			
Own	23.223 (6.960)	26.440 (5.411)	-1.883
Thin	27.754 (7.919)	29.962 (6.507)	-1.111
Average-weight	25.972 (6.607)	26.409 (4.387)	-0.285
Fat	19.043 (7.506)	20.961 (5.858)	-1.039
Muscular	23.565 (7.451)	25.566 (4.455)	-1.182
Gaze duration (s) – other			
Own	20.741 (6.153)	22.595 (4.543)	-1.251
Thin	23.021 (6.935)	26.581 (5.077)	-2.138*
Average-weight	20.772 (6.529)	23.553 (3.457)	-1.927
Fat	19.552 (6.664)	21.060 (5.538)	-0.897
Muscular	22.613 (7.279)	24.939 (4.376)	-1.403
Body satisfaction			
Pre-experiment	26.877 (13.907)	74.489 (13.204)	0.899
Post-experiment	24.242 (15.594)	75.859 (16.154)	1.776
Mood			
Pre-experiment	39.546 (21.033)	75.426 (16.628)	-0.653
Post-experiment	31.492 (19.140)	71.904 (20.822)	0.839

Note. high BD = high levels of body dissatisfaction; low BD = low levels of body dissatisfaction.
**p < .01.*

the high BD group would show a greater attentional bias towards their own body presented with their own face than another face. However, there was no significant interaction among group, face, and build type, $F(4, 204) = 1.874$, *n.s.* There was a significant main effect of build type, $F(4, 204) = 18.205$, $p < .001$, $\eta^2 = .263$. The results of the post-hoc test revealed that all participants showed a

greater gaze duration for their own bodies than for fat bodies. They also gazed at a thin body longer than at their own, average-weight, fat, and muscular bodies. In addition, the participants gazed at a fat body less than an average-weight or muscular body (Figure 2 and Table 2).

Ratings for Body Attractiveness, Emotional Arousal, Valence, Body Fat, and Muscle Mass

A 2 (group: high BD, low BD) × 5 (build type: own, thin, average-weight, fat, muscular) × 5 (rating: attractiveness, emotional arousal, valence, body fat, muscle mass) repeated-measure ANOVA showed a significant group × build type × rating interaction, $F(16, 816) = 2.184$, $p = .017$, $\eta^2 = .041$. There was a significant group × rating interaction, $F(4, 204) = 3.943$, $p = .004$, $\eta^2 = .072$. The results of the post-hoc test revealed that the high BD group rated their own body as significantly less attractive, lower in valence, and lower in muscle mass when their own face was presented rather than with another woman's face, as compared to the low BD group, $F(1, 51) = 16.117$, $p < .001$, $\eta^2 = .240$; $F(1, 51) = 20.031$, $p < .001$, $\eta^2 = .282$; $F(1, 51) = 5.260$, $p = .026$, $\eta^2 = .093$. It is consistent with our hypothesis that individuals with high BD would also rate their own bodies with their own face as less attractive than with another face. In contrast, the high BD group rated their own bodies as significantly higher on body fat with their own face than with another woman's face, relative to the low BD group, $F(1, 51) = 4.977$, $p = .030$, $\eta^2 = .089$. The high BD group rated fat bodies as significantly higher on muscle mass when one's own face, rather than that of another woman, was presented to them, $F(1, 51) = 10.775$, $p = .002$, $\eta^2 = .174$, compared to the low BD group (Table 3).

Table 3. *Mean (SD) of the Double Standard Scores, and post-hoc t-test for Each Group*

	High BD ($n = 26$)	Low BD ($n = 27$)	*F*
DS attractive			
Own	0.404 (0.822)	-0.509 (0.833)	4.015*
Thin	-0.058 (0.719)	-0.234 (0.876)	0.797
Average-weight	-0.539 (1.080)	-0.205 (1.032)	1.150
Fat	-0.529 (0.661)	-0.336 (0.909)	0.879
Muscular	-0.077 (1.031)	-0.261 (0.737)	1.378
DS arousal			
Own	-0.000 (1.091)	-0.259 (0.839)	0.972
Thin	-0.423 (1.166)	-0.198 (0.858)	-0.800
Average-weight	-0.043 (0.866)	-0.241 (1.048)	-1.073
Fat	-0.615 (1.463)	-0.140 (1.172)	-1.308
Muscular	-0.414 (0.765)	-0.333 (0.861)	-0.358
DS valence			
Own	0.740 (1.048)	-0.3704 (0.738)	4.476*
Thin	-0.019 (0.874)	-0.2438 (1.125)	0.809
Average-weight	-0.630 (1.022)	-0.5100 (1.023)	0.427
Fat	-0.894 (1.359)	-0.5082 (0.754)	1.272
Muscular	-0.279 (0.867)	-0.2119 (0.701)	2.270*
DS body fat			
Own	-0.394 (0.895)	0.0926 (0.683)	-2.231*
Thin	-0.019 (0.570)	0.2047 (0.736)	-1.023
Average-weight	-0.399 (0.863)	-0.3205 (0.534)	-0.400
Fat	-0.404 (0.704)	-0.3107 (0.445)	-0.573
Muscular	0.000 (1.020)	-0.0391 (0.513)	-0.177*
DS muscle mass			
Own	0.202 (0.732)	-0.259 (0.732)	-2.294*
Thin	-0.192 (1.211)	-0.082 (0.940)	-0.370
Average-weight	-1.083 (0.944)	-0.987 (0.787)	-0.406
Fat	-0.490 (0.602)	-0.041 (0.372)	-3.254
Muscular	-0.202 (0.938)	-0.015 (0.382)	-0.941

Note. high BD = high levels of body dissatisfaction; low BD = low levels of body dissatisfaction; DS = Double standard bias score (other – self face).
**p < .01.*

Discussion

This study aimed to explore whether women with high levels of body dissatisfaction have a self-deprecating bias towards bodies when evaluating bodies presented with their own or other women' s faces. The eye-tracking results showed that there was a significant difference in participants' evaluation of their own bodies when presented with their own faces as compared to when their bodies were presented with another's face. Specifically, the high BD group rated their own bodiesand faces as significantly less attractive than the low BD group. Both attentional bias and rating scores for body stimuli will discussed according to body type.

The results showed that both the high BD and low BD groups gazed longer at their own bodies when presented with their own faces than with another woman's face. Compared to the low BD group, the high BD group evaluated their own bodies as less attractive and negative and as having less muscle mass when their own faces, rather than another woman's face, were presented. This is consistent with previous studies that assumed self-deprecating double standards for average-weight as their own bodies (Voges et

https://doi.org/10.15842/kjcp.2023.42.3.003

al., 2019). In sum, while both the high and low BD groups gazed longer at bodies with their own faces (compared to bodies with the face of another woman), the high BD group gazed at their own body longer and rated it as less attractive than the low BD group. These findings suggest that individuals with high BD have a self-deprecating bias toward their own bodies. The results also suggest that the high BD group maintains or increases dissatisfaction with their bodies because they gaze at their own body with a negative evaluation that it is unattractive.

Both the high and low BD groups gazed longer at pictures of thin bodies with their own faces than at pictures of another woman's face. Pictures of thin bodies were also gazed at longer than pictures presenting bodies of other types (such as own, average-weight, fat, and muscular). These results are consistent with our hypotheses and previous research (Cho & Lee, 2013), and suggest that thin bodies are familiar to both groups due to the impact of social media (Hawkins et al., 2004). Although there was no significant group difference for thin bodies, both groups reported that thin bodies with their own faces appeared more attractive than thin bodies with the faces of other women. These results confirm that thin bodies are idealized, in line with the social comparison theory (Festinger, 1954). Accordingly, the high BD group may suffer from body dissatisfaction because of their comparison with thin bodies. In other words, the high BD groups perceived thin bodies with their own faces as attractive (Ahern et al., 2008), which suggests that they have a thin idealization and apply stricter standards to themselves than others. Interestingly, both the high and low BD groups gazed less at fat bodies than at bodies of other types, regardless of the face presented in the pictures (Cho & Lee, 2013). In line with these results, both groups reported that fat bodies when presented with their own faces were less attractive than the same bodies when presented with the faces of another woman; however, there was no significant difference between the groups. These results suggest that the high BD group may tend to avoid fat bodies as negative (Seifert et al., 2008).

This study has several limitations. First, there is ambiguity regarding whether the low BD was satisfied with their own bodies. For this reason, we labelled it a low BD group rather than a body satisfaction group, and both body satisfaction and dissatisfaction questions were asked when screening participants using the EDI-2. Second, the study mainly focused on undergraduates, although men also experience dissatisfaction with their own bodies (Cordes et al., 2017; Galioto & Crowther, 2013). Therefore, in future studies, it is necessary to consider both women and men when studying self-deprecating DS in individuals with body dissatisfaction, regardless of occupation, sex, etc.

Despite these limitations, the results confirm self-deprecating DS toward one's own body in individuals with high body dissatisfaction, using an eye-tracking system and rating scales. Measuring longer gaze duration and lower rating scores of body attractiveness toward one's own body when looking at one's own face than with another woman's face may suggest a mechanism that increases body dissatisfaction. In summary, these findings could confirm a body-related identity bias (Buote et al., 2011; Voges et al., 2019) in BD based on self-deprecating DS in body evaluation. As a therapeutic approach to high levels of body dissatisfaction, it may be helpful to reduce identity and attentional biases toward their own and thin bodies (Voges et al., 2019; Voges et al., 2018; Williamson et al., 2004). It could also be incorporated into psychoeducation by teaching students about identity biases and applying it to psychological interventions. Furthermore, it may be helpful to reduce the schema-distorted perception of one's own body in body exposure therapy (Jansen et al., 2016; Trentowska et al., 2014) by changing the perspective of body image.

Author contributions statement

Y. J. Park, graduate student at Chung-Ang University, collected and analyzed the data and prepared the manuscript. J. H. Lee, professor at Chung-Ang University supervised the research process. All the authors provided critical feedback, participated in the revision of the manuscript, and approved the final submission.

Y. J. Park, graduate student at Chung-Ang University who is now a clinical psychology resident at CHA University Bundang Medical Center, designed the study.

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