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Brief research report

Attentional engagement with and disengagement from appearance ideals: Differential associations with body dissatisfaction frequency and duration?

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ABSTRACT

Recent work has served to dissociate two dimensions of trait body dissatisfaction: body dissatisfaction frequency and body dissatisfaction duration. The present study sought to evaluate whether body dissatisfaction frequency and body dissatisfaction duration are each associated with distinct patterns of appearance-related cognitive processing. It was hypothesized that speeded attentional engagement with idealized bodies is associated with higher frequency of body dissatisfaction episodes, while slowed attentional disengagement from such information may instead be associated with higher duration of body dissatisfaction episodes. Participants (238 women, 149 men) completed an attentional task capable of independently assessing attentional engagement with, and attentional disengagement from, idealized bodies. Participants also completed both trait and in vivo (i.e., ecological momentary assessment) measures of body dissatisfaction frequency and duration. Results showed that neither engagement nor disengagement bias index scores predicted variance in either body dissatisfaction frequency measures or body dissatisfaction duration measures. Findings suggest that either biased attentional engagement with, and disengagement from, idealized bodies do not associate with the frequency and duration of body dissatisfaction episodes, or there are other key moderating factors involved in the expression of body dissatisfaction-linked attentional bias.

1. Introduction

Trait body dissatisfaction has typically been considered a unitary construct reflecting individual differences in the disposition to experience state episodes of dissatisfaction with shape and/or weight. However, recent work by Dondzilo & Rodgers et al. (2022) has shown that there are at least two different types of dispositions that serve to increase the amount of time spent experiencing body dissatisfaction. Specifically, one type of disposition reflects increased frequency with which an individual experiences episodes of body dissatisfaction (i.e., body dissatisfaction frequency), and another type of disposition reflects more prolonged body dissatisfaction episodes (i.e., body dissatisfaction duration). Across three studies, Dondzilo & Rodgers et al. (2022) showed that these two dispositions can be structurally distinguished (i.e., CFA's consistently provided support for a two-factor structure), meaningfully distinguished (i.e., each disposition accounted for unique variance in trait body dissatisfaction) and further indicated clinical relevance in distinguishing between body dissatisfaction frequency and duration by revealing that each disposition associates with differing aspects of disordered eating behavior. Given that frequency and duration represent dissociable dimensions of trait body dissatisfaction, it may be that each dimension is underpinned by differing cognitive

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mechanisms.

Cognitive theories of body dissatisfaction implicate the relevance of biased patterns of selective attentional processing of appearance-related information in the development and maintenance of body dissatisfaction and associated mental health concerns (Cash & Labarge, 1996; Williamson et al., 2004). Research indicates that elevated trait body dissatisfaction is characterized by speeded attentional detection of idealized body stimuli, specifically, thin-ideal bodies for women and muscular bodies for men (House et al., 2023; Rodgers & DuBois, 2016; Talbot & Saleme, 2022). The patterns of attentional selectivity underpinning the frequency and duration of body dissatisfaction episodes, however, remains unknown. There is considerable evidence that two distinct components of attentional selectivity, namely *attentional engagement bias* and *attentional disengagement bias*, differentially impact the frequency and duration of anxiety-related symptomatology. Specifically, it has been shown that speeded attentional engagement with negative information contributes to more frequent experiencing of anxiety-related symptoms, whereas slowed attentional disengagement from such information instead contributes to increased duration of these symptoms (Dondzilo & Grafton, et al., 2022; Grafton et al., 2016; Hirsch et al., 2011; Southworth et al., 2016). Extending these findings to trait body dissatisfaction, it may be that biased attentional engagement with, and biased attentional disengagement from, idealized bodies also differentially contribute to the frequency with which people experience episodes of body dissatisfaction and to the duration of such episodes.

The present study sought to evaluate whether appearance-related attentional engagement and disengagement biases differentially associate with trait and in vivo (i.e., daily life) measures of body dissatisfaction frequency and duration. Specifically, it was hypothesized that speeded attentional engagement with idealized bodies (i.e., thin-ideal bodies for females and muscular bodies for men) would be associated with more frequent body dissatisfaction episodes, whereas slowed disengagement from such information would be associated with increased duration of body dissatisfaction episodes. The present study additionally sought to determine the replicability of prior associations between attentional engagement bias and appearance comparisons (Dondzilo et al., 2021, 2023). In this study, undergraduate students were recruited to complete self-report measures of body dissatisfaction frequency and duration and appearance comparisons as well as a variant of the Attentional Response to Distal vs. Proximal Emotional Information (ARDPEI) task (Grafton & MacLeod, 2014) for the purpose of separately assessing biased attentional engagement with, and biased attentional disengagement from, idealized bodies. Participants also completed a 7-day ecological momentary assessment (EMA) diary which required them to record body dissatisfaction episodes upon each occurrence and to complete subsequent follow-up surveys about the duration of each episode. The EMA diary thus yielded in vivo measures of body dissatisfaction frequency and duration.

2. Method

2.1. Participants and procedures

A total of 387 undergraduate students (238 women, 149 men) were recruited from research participation pools at two Australian universities; the University of Western Australia and the University of Melbourne. Participants completed the study online using their own computers. After providing informed consent, participants completed demographic items and self-report measures via Qualtrics. Next, participants completed a practice version of the current ARDPEI task, followed by the test version of the task via Inquisit Web. After completing the ARDPEI task, participants downloaded the EMA diary smartphone application via the iTunes AppStore. The EMA diary commenced the subsequent day and was completed across seven consecutive days. At the end of the seven-day period all participants were compensated with partial course credit. This study was approved by the research ethics committees at both universities. Ethics approval numbers are as follows: 2020/ET000292 (University of Western Australia) and 2021–22738-21773–2 (University of Melbourne).

2.2. Materials and measures

2.2.1. Body dissatisfaction frequency and duration questionnaire (BDFDQ)

The BDFDQ (Dondzilo & Rodgers, et al., 2022) was employed to separately assess body dissatisfaction frequency and duration. Participants provided two responses for each of the 20 items assessing shape/weight-dissatisfaction episodes (e.g., I feel dissatisfied while thinking about my shape). Specifically, participants indicated on six-point response scales the frequency with which they were likely to experience each particular episode (*1 = extremely infrequently; 6 = extremely frequently*) and the likely duration of this episode (*1 = extremely brief time; 6 = extremely long time*). Higher average frequency and duration scores reflected greater body dissatisfaction frequency and duration, respectively. The BDFDQ has shown excellent psychometric properties in both females and males (Dondzilo et al., 2023). Internal consistency was high in the current sample (Cronbach's $\alpha = .98$ for both subscales).

2.2.2. Physical appearance comparison scale-3 (PACS-3)

The 9-item PACS-3 (Schaefer & Thompson, 2018) was employed to assess the tendency to engage in physical appearance comparisons (e.g., When I'm out in public, I compare my weight/shape to the weight/shape of others). Items are scored on a 5-point response scale (1 = *never*, 5 = *almost always*) with higher mean scores indicating greater tendency to engage in appearance comparisons. Internal consistency in the current sample was high ($\alpha = .92$).

2.2.3. Attentional response to distal vs. proximal emotional information (ARDPEI) task

The ARDPEI task (Grafton & MacLeod, 2014) was used to assess selective attentional engagement with, and disengagement from, images of idealized bodies relative to non-idealized bodies.

2.2.3.1. Stimulus images. The ARDPEI task made use of two validated stimulus sets comprising 40 image pairs. In all image pairs, one image was non-representational abstract art, while the other image was a body. In the stimuli set validated for female samples (Dondzilo et al., 2017), these were female bodies, half of which were thin-ideal female bodies and half of which were non-thin female bodies. These images of female bodies specifically depicted weight and/or shape relevant body parts (e.g., abdomen, thighs) of predominantly white women. In the stimulus set validated for male samples (Dondzilo et al., 2019), theses were male bodies, half of which were muscular male bodies while the other half were non-muscular bodies. These images of male bodies specifically depicted areas of the body most reflective of body fat and muscle mass (e.g., chest, biceps) of predominantly white men. In the ARDPEI task, female participants were presented with the image pairs containing female bodies, whereas male participants were presented with the image pairs containing male bodies.

2.2.3.2. Assessment task. Each trial commenced with the presentation of a red square, that appeared in the centre of either the right or left side of the screen with equal frequency. Participants were required to initially focus their attention within this red square. After 1000 ms, a small red line briefly appeared within this attended region and participants were required to simply observe its orientation (i.e., which was either horizontal or vertical). Immediately thereafter, the red square containing the small red line disappeared and one of the stimulus image pairs was presented for 500 ms. On half the trials, the image containing a body appeared in the opposite location to that where the participant's initial attention had been anchored, and these trials served to assess selective *attentional engagement* with idealized vs. non-idealized bodies. On the other half of the trials, the image containing a body appeared in the same location where the participant's initial attention had been anchored, and these trials served to assess selective *attentional disengagement* from idealized vs. non-idealized bodies. After 500 ms, the image pair disappeared, and a target probe (small red line, with either horizontal or vertical orientation) was presented in either of the two screen regions with equal probability. Participants were required to indicate, as quickly as possible, whether the orientation of this target probe was the same as (50% of the trials), or different from, the orientation of the small red line that had preceded presentation of the image pair by pressing either the 'S′ or 'D′ key on the keyboard, respectively. The reaction time (RT) of this probe discrimination response was recorded, together with accuracy of the response. After 1000 ms, the next trial commenced. The task delivered two blocks of 160 trials, separated by a break. Within each block, order of trial condition was randomised for each participant.

2.2.3.3. Calculation of engagement and disengagement bias index scores. For each participant, indices of engagement bias and disengagement bias were computed from their recorded RTs to accurately make the probe discrimination responses required in the ARDPEI task, as described below.[1] Participants were excluded if their overall level of accuracy fell below 85%.

The engagement bias index was computed using RTs only from trials on which the image containing a body was presented distally from initial attentional focus. The equation yielding this index was as follows:

Engagement bias index = (anchor cue distal from idealized body: RT for target probe in locus of abstract image *minus* RT for target probe in locus of idealized body) *minus* (anchor cue distal from non-idealized body: RT for target probe in locus of abstract image *minus* RT for target probe in locus of non-idealized body). A higher engagement bias index score indicated increased attentional engagement with idealized vs non-idealized bodies.

The disengagement bias index was computed using RTs only from trials on which the image containing a body was presented proximal to initial attentional focus. The equation yielding this index was as follows:

Disengagement bias index = (anchor cue proximal to idealized body: RT for target probe in locus of abstract image *minus* RT for target probe in locus of idealized body) *minus* (anchor cue proximal to non-idealized body: RT for target probe in locus of abstract image *minus* RT for target probe in locus of non-idealized body). A higher disengagement bias index score indicated reduced attentional disengagement from idealized vs. non-idealized bodies.

2.2.4. Ecological momentary assessment (EMA) diary

An EMA diary was used to obtain in vivo (i.e., daily life) measures of body dissatisfaction frequency and duration. Participants were instructed to record the experience of body dissatisfaction episodes as soon as such episodes occurred using the EMA Diary smartphone application. Participants were also informed that, after recording an episode, they would receive a notification 30 min later to complete a follow-up survey. In the follow-up survey participants were asked to specify the duration of the episode on a visual analogue scale ranging from 1 (1 min or less) to 30 (30 min or longer). In addition, participants were informed that to be counted as a new episode, at least 30 min needed to have passed between the end of one episode and the start of a new episode. The EMA diary application therefore restricted participants from completing further surveys until 30 min had passed. Participants were also required to "check-in" every evening across the seven-day period, to confirm that they were still monitoring their episodes of body dissatisfaction, which provided a measure of compliance with the EMA diary monitoring requirement.

The measure of in vivo *frequency* was computed as the total number of times participants recorded a body dissatisfaction episode across the seven-day period.[2] The measure of in vivo *duration* was computed as the average of all completed duration assessments across the seven-day period. Additionally, we computed the within-person variability of the in vivo duration measure.

2.3. Analytic Strategy

Pearson correlations were computed to determine associations between attentional bias indices, appearance comparisons, and trait and in vivo measures of body dissatisfaction frequency and duration. To test the hypothesis that engagement bias and disengagement bias differentially account for variance in body dissatisfaction frequency and duration, a series of multiple regression analyses were performed on the trait and in vivo measure of body dissatisfaction frequency and on the trait and in vivo measure of body dissatisfaction duration. We performed these analyses separately for female and male participants. In each analysis, engagement and disengagement bias index scores were entered as the predictor variables. All analyses controlled for age and BMI. Additionally, we estimated the internal consistency of the attentional bias index scores using a permutation-based split-half reliability approach that employed 5000 random splits (Parsons, 2020).

3. Results

3.1. Participant exclusion and sample characteristics

Forty-one participants failed to meet the required 85% accuracy requirement, and so were excluded from analyses. The remaining 346 participants (138 males, 208 females) were considered in analyses concerning attentional bias indices and trait body image measures. Of these 346 participants, 271 participants (102 males, 169 females) completed the EMA diary (85% average compliance) and were thus considered in analyses concerning EMA measures. Across the 7-day EMA period, 68% of males and 77% of females reported at least one body dissatisfaction episode. Within-person variability in body dissatisfaction duration was relatively low (3.71 min for males and 5.26 min for females). Characteristics and descriptive statistics associated with the sample are reported in Table 1.

3.2. Associations between attentional bias indices, appearance comparisons, and body dissatisfaction frequency and duration

Correlations are reported in Table 2. Reassuringly, there were significant correlations between the questionnaire and in vivo measures of both body dissatisfaction frequency and duration. Also, the measure of appearance comparisons correlated positively and significantly with questionnaire and in vivo measures of both body dissatisfaction frequency and duration. However, neither attentional engagement bias index scores nor attentional disengagement bias index scores were significantly correlated either with our measures of body dissatisfaction frequency and duration, or with our measure of appearance comparisons.

3.3. Capacity of attentional bias indices to predict body dissatisfaction frequency and duration

The outcomes of the regression analyses are reported in Table 3. In the regression analyses that considered *body dissatisfaction frequency* as

[1] Outlier probe discrimination latencies were handled in the same manner as prior research (Dondzilo et al., 2021, 2023).

[2] This measure was adjusted for number of subsequent duration surveys completed (i.e., total frequency was equal to total number of duration surveys completed).

Table 1
Sample characteristics and descriptive statistics.

	Females ($N = 208$)	Males ($N = 138$)
Age, *years* (*M, SD;* Range)	20.85 (6.38); 16-62	20.99 (6.33); 17-56
BMI, *kg/m²* (*M, SD;* Range)	23.19 (6.21); 15.60-60.60	23.34 (3.83); 16.07-35.51
Ethnicity (*n*, %)		
Caucasian	114 (54.8)	81 (58.7)
Asian	64 (30.8)	38 (27.5)
Other	30 (14.4)	19 (13.8)
Engagement bias index (*M, SD*)	8.91 (88.96)	3.42 (98.59)
Disengagement bias index (*M, SD*)	-3.79 (215.28)	-4.32 (205.95)
BDFDQ Frequency (*M, SD*)	3.58 (1.36)	2.35 (1.09)
BDFDQ Duration (*M, SD*)	3.13 (1.27)	2.13 (.97)
EMA Frequency (*M, SD*)	3.22 (3.60)	2.06 (3.97)
EMA Duration (*M, SD*)	11.31 (7.96)	5.73 (5.09)
PACS-3 (*M, SD*)	2.84 (.97)	2.48 (.95)

Note. BMI = Body Mass Index (kg/m^2). BDFDQ = Body Dissatisfaction Frequency Duration Questionnaire. PACS-3 = Physical Appearance Comparisons Scale-3. BMI data were missing for six participants. EMA frequency and duration descriptive statistics are based on the 271 participants who completed the EMA component of the study.

the outcome variable, neither attentional engagement nor disengagement bias index scores predicted variance in this measure of body dissatisfaction. Similarly, in the regression analyses that considered *body dissatisfaction duration* as the outcome variable, neither attentional engagement nor disengagement bias index scores predicted variance in this measure of body dissatisfaction. These null results were consistent across both female and male samples.

3.4. Reliability of attentional engagement and disengagement bias indices

The (Spearman-Brown corrected) split-half internal consistency for the engagement bias index score was exceptionally low in both the female ($r_{sb} = -.08$) and male sample ($r_{sb} = .06$). The split-half internal consistency for the disengagement bias score was relatively low in both the female ($r_{sb} = .34$) and male sample ($r_{sb} = .51$).

4. Discussion

The aim of this study was to test the hypothesis that body dissatisfaction and duration are each associated with distinct patterns of attentional processing. Specifically, it was hypothesized that increased frequency of body dissatisfaction episodes would be associated with speeded attentional engagement with idealized body stimuli, whereas increased duration of body dissatisfaction episodes would be associated with slowed attentional disengagement from such information. Overall, our findings did not support this hypothesis. Neither the attentional bias engagement index nor the disengagement index were significantly associated with our measures of body dissatisfaction frequency and duration, regardless of whether these latter measures were based on questionnaire responses or EMA assessment.

The present findings suggest that attentional biases might not be the primary drivers of body dissatisfaction frequency and duration, which is consistent with some other studies showing no relationship between attentional bias and body dissatisfaction (Cass et al., 2020; Glauert et al., 2010). Nonetheless, distinguishing between body dissatisfaction frequency and duration has the potential both to advance theoretical understanding of body dissatisfaction and to inform intervention approaches. Thus, further work exploring how cognitive biases may

Table 2
Correlations between attentional bias indices, appearance comparisons, and body dissatisfaction frequency and duration.

Measure	Engagement Bias	Disengagement Bias	BDFDQ Frequency	BDFDQ Duration	EMA Frequency	EMA Duration	PACS-3
Female sample							
Engagement Bias	-						
Disengagement Bias	.18**	-					
BDFDQ Frequency	.00	.06	-				
BDFDQ Duration	.02	.08	.87**	-			
EMA Frequency	.03	-.01	.46**	.42* *	-		
EMA Duration	-.07	-.02	.46**	.55**	.15	-	
PACS-3	-.03	.02	.60**	.55**	.36**	.29**	-
Male sample							
Engagement Bias	-						
Disengagement Bias	-.32**	-					
BDFDQ Frequency	-.04	-.06	-				
BDFDQ Duration	-.08	-.04	.90**	-			
EMA Frequency	-.01	.04	.32**	.22*	-		
EMA Duration	.08	.13	.51**	.56**	.18	-	
PACS-3	-.03	.04	.46**	.46**	.21*	.32*	-

Note. BDFDQ = Body Dissatisfaction Frequency Duration Questionnaire, PACS-3 = Physical Appearance Comparison Scale-3.
$p < .01^{**}$, $p < .05^{*}$.

Table 3
Parameter estimates of regression models.

	Model 1: BDFDQ Frequency				Model 2: BDFDQ Duration				Model 3: EMA Frequency				Model 4: EMA Duration			
	Females		Males		Females		Males		Females		Males		Females		Males	
	β	*p*	β	*p*	β	*p*	β	*p*	β	*p*	β	*P*	β	*p*	β	*p*
Age	-.30	.001	-.16	.058	-.30	.001	-.19	.027	-.09	.292	.43	.001	-.21	.043	.03	.816
BMI	.30	.001	.41	.001	.20	.004	.32	.001	.14	.090	.27	.003	.08	.426	.07	.637
Engagement Bias	-.03	.640	-.05	.533	-.01	.849	-.09	.286	.01	.931	-.05	.598	-.09	.359	.10	.478
Disengagement Bias	.09	.175	-.02	.787	.10	.132	-.03	.730	.00	.977	.00	.982	.02	.828	.14	.306

Note. β = standardized beta coefficient.
Model 1 (females): R = .37; R^2 = .13. Model 1 (males): R = .41; R^2 = .17. Model 2 (females): R = .33; R^2 = .11. Model 2 (males): R = .35; R^2 = .12. Model 3 (females): R = .14; R^2 = .02. Model 3 (males): R = .55; R^2 = .31. Model 4 (females): R = .20; R^2 = .04. Model 3 (males): R = .18; R^2 = .03.
BDFDQ = Body Dissatisfaction Frequency Duration Questionnaire.

underly these two components of body dissatisfaction, in particular biases reflecting engagement or preoccupation with appearance-related information over long time periods, is warranted.

It is worth acknowledging that our findings also failed to replicate the previously reported association between biased attentional engagement and appearance comparison (Dondzilo et al., 2021, 2023). The failure to replicate this previous relationship could be due to the observed low reliability of the attentional bias indices. Importantly, however, it is becoming increasingly evident that attentional bias is a probabilistic phenomenon, rather than a stable one, that is moderated by a range of factors (e.g., personal relevance of stimuli, current mood state, attentional control; Dondzilo & Basanovic, 2023; MacLeod et al., 2019). Cognitive theories of body dissatisfaction also highlight the relevance of various factors, such as negative affect, in the expression of attentional biases (Williamson et al., 2004). As such, it remains uncertain whether the observed low reliability of the ARDPEI task reflects the sensitive detection of genuine within-session variability in the expression of attentional engagement and disengagement biases or whether it instead reflects measurement error attributable to psychometric limitations of this task. Therefore, it will be important for future researchers to differentiate between genuine individual variability in attentional responding and measurement error reflecting the psychometric unreliability of the ARDEPI task. For example, future research could examine whether multiple measures of attentional bias (e.g., by recording eye gaze while also collecting reaction time data using the ARDPEI task) can serve to better classify individuals in terms of their probability of exhibiting attentional bias towards idealized bodies.

For the moment, findings from the present study suggest that body dissatisfaction frequency and duration are not associated with distinct patterns of appearance-related attentional processing. Future researchers are encouraged to extend on this work by exploring other potential underpinning mechanisms of these two dissociable dimensions of body dissatisfaction.

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CRediT authorship contribution statement

Krug Isabel: Writing – review & editing, Methodology, Conceptualization. **Vartanian Lenny R.:** Writing – review & editing, Methodology, Conceptualization. **MacLeod Jasmine:** Writing – review & editing, Methodology, Investigation. **Preece David A.:** Writing – review & editing, Methodology. **Fuller-Tyszkiewicz Matthew:** Writing – review & editing, Methodology, Conceptualization. **Rodgers Rachel F.:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Dondzilo Laura:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **MacLeod Colin:** Writing – review & editing, Methodology, Conceptualization.

Declaration of Competing Interest

The authors declare no conflict of interest.

Data Availability

Data will be made available on request.

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