

# Evidence for Attentional Bias in Women Exhibiting Bulimotypic Symptoms

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## ABSTRACT

**Objective:** One of the defining features of bulimia is a pervasive tendency to focus on and evaluate one's own body. The extent to which bulimotypic symptoms are associated with biases in attention to other individuals in the social world is less well known. In the current study, we examined the relation between bulimotypic symptoms and biases in attention to other men and women.

**Method:** A sample of undergraduate women performed a visual cueing task designed to assess attention to target faces varying in their gender and level of attractiveness.

**Results:** Women with relatively high levels of bulimotypic symptomatology tended to dwell on attractive female faces, but not other faces. This attentional bias was not attributable to perfectionistic ideals, body dissatisfaction, or self-esteem.

**Conclusion:** Findings could reflect a link between disordered eating and the perception of competitive threat in other attractive women. © 2005 by Wiley Periodicals, Inc.

**Keywords:** bulimia; attentional bias; disordered eating; attractive women

(*Int J Eat Disord* 2006; 39:55–61)

## Introduction

Much is known about bulimic women's attention to their own physical attributes. Bulimic women are generally dissatisfied with their appearance, shape, and weight. Indeed, self-focused body dissatisfaction is a defining symptom of bulimia. However, research has left relatively unexplored the possibility that bulimia is associated with pervasive biases in the way women think about and attend to other women. Surprisingly little research has examined the presence of such social cognitive biases in women exhibiting bulimotypic symptoms.

There has been some research on the social cognitive component of bulimia. Much of this work has focused on how media portrayals of thin women influence women's mood and body attitudes. For example, viewing television commercials containing appearance-related images can nega-

tively affect the mood and body image satisfaction of undergraduate women.<sup>1</sup> A recent meta-analysis of 25 studies suggests that exposure to thin body images, compared with other images (e.g., average size models, inanimate objects), leads women to view their own bodies in a more negative fashion.<sup>2</sup> The authors suggested that this effect might be due to women engaging in social comparison, whereby they view themselves as inadequate in comparison to thin models.

Tiggemann and McGill<sup>3</sup> tested this hypothesis further, and found that the effects of exposure to thin images on mood and body dissatisfaction were partially mediated by the amount of social comparison in which the participant engaged. That is, the more the participant compared themselves with the thin models, the more likely they were to experience negative mood, increased body dissatisfaction, and lowered self-esteem. Studies have found each of these variables to be predictive of the later onset of bulimia nervosa symptoms.<sup>4,5</sup> Thus, exposure to attractive faces or thin bodies (e.g., in magazines or on television) may confer the risk for eating disorder development in women, particularly if they tend to engage in social comparison. Studies such as these document an association between exposure to attractive others and bulimia-related symptoms such as body dissa-

Accepted 15 May 2005

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Published online 17 October 2005 in Wiley InterScience (www.interscience.wiley.com). DOI: 10.1002/eat.20222

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tisfaction, but many unanswered questions remain. The current research focuses on the following question: Do women exhibiting bulimotypic symptoms preferentially attend to other attractive women in the social environment?

There is some evidence that this might be the case. Jansen et al.<sup>6</sup> used an eye tracking method to investigate selective attention to beautiful and ugly body parts in women with eating-disordered symptoms. When they were attending to their own body parts, eating-disordered participants spent significantly more time looking at their self-identified ugly body parts than at their self-identified beautiful body parts (no such bias was observed in control participants). However, a very different pattern emerged when eating-disordered women were attending to the body parts of other women. In this case, eating-disordered participants fixated more on physically attractive body parts than on less attractive parts, whereas nondisordered controls showed the opposite trend. Although disturbances in perceptions and evaluations of one's own body are key symptoms of eating disorders,<sup>7</sup> these data suggest that individuals with eating-disordered symptomatology may also differ from controls in their allocation of attention to attractive features in others.

Is this attentional bias limited to a focus on attractive body features in others, or might women exhibiting bulimotypic symptoms attend more to other signs of attractiveness, as well? Research suggests that visual processing and attention allocation are particularly strong for faces, as compared with other visual stimuli.<sup>8,9</sup> We, therefore, wondered if bulimic symptomatology also might be linked to selective attention to others' attractive faces. In addition, Jansen et al.<sup>6</sup> only investigated attention to images of women, leaving unanswered the question of whether images of attractive men might capture attention to the same extent. Finally, if there is an association between bulimotypic symptoms and attention to other attractive women, is it explained by bulimotypic variables such as perfectionism (i.e., attention to perfectionistic ideals) or body dissatisfaction (i.e., attention driven by social comparison)?

If an association between attention to attractive females and bulimotypic symptoms exists, it could be explained in several ways. First, given the association between perfectionism and bulimotypic symptoms, attention to attractive faces by women exhibiting bulimotypic symptoms may be due to their interest in perfectionistic goals/standards (in this case, exemplified by highly attractive faces). Second, because bulimia is associated with general

negative self-esteem, it is possible that women with low self-esteem in general, and not just women with bulimotypic symptoms in particular, are especially attentive to other women's attractive faces.

Third, given that body dissatisfaction is a core feature of bulimia, the hypothesized attentional bias could be due to processes associated with social comparison—attending to attractive others as a means of assessing one's own level of attractiveness. Based on Festinger's<sup>10</sup> social comparison framework, research suggests that appearance-focused social comparison is related to emotional distress, self-esteem, and eating-disordered symptomatology.<sup>11,12</sup> Comparing one's own appearance with that of others is typically associated with a greater level of eating-disordered symptomatology, which, in turn, is related to lower self-esteem.<sup>12</sup> A social comparison framework suggests three potential motives for social comparison—self-evaluation, self-improvement, or self-enhancement.<sup>13</sup> Because all three motives involve changes in feelings toward the self, this framework also suggests that social comparison processes are inextricably linked to self-esteem. Thus, if the association between attention to attractive females and bulimotypic symptoms results from social comparison processes, this would suggest the presence of upward social comparison (i.e., comparing the self with others seen as more attractive) and, therefore, would be accompanied by body dissatisfaction and lower self-esteem.

A fourth possibility should also be considered: Women with bulimotypic symptoms may be inclined to view attractive females as competitive threats. There is evidence that women tend to feel competitive with one another on the basis of physical attractiveness.<sup>14</sup> There is also evidence that this competition is based, in part, on competition for potential mates.<sup>15</sup> Maner et al.<sup>16</sup> provided evidence that this sense of intrasexual competition can manifest itself in attentional vigilance, with women preferentially attending to other attractive females. For example, women in insecure relationships, who, therefore, are in a particular position to view other women as potential threats, are most inclined to attend preferentially to attractive women. A similar attentional bias has been observed in women prone to strong feelings of sexual jealousy and worry over relationship threats posed by attractive female competitors (unpublished observations). Women exhibiting bulimotypic symptoms—who tend to overevaluate themselves based on physical appearance—may feel particularly vulnerable to such threats and, therefore, might be expected to vigilantly attend to signs of attractiveness in other women.

To examine these possibilities, we had female undergraduates perform a visual cueing task (commonly known as a “dot probe” task<sup>17</sup>) designed to assess the presence of attentional bias. This method has been used most frequently for studying attentional vigilance to threat-related stimuli.<sup>18–22</sup> In the current study, women were presented with images of women’s and men’s faces that varied in attractiveness. We assessed the extent to which women’s attention was captured by each type of face. Bulimotypic symptoms, body dissatisfaction, perfectionism, and state self-esteem were assessed using self-report questionnaires. We examined whether there was an association between bulimotypic symptoms and attention to attractive women’s faces, and whether such an association could be explained with reference to perfectionism, body dissatisfaction, or an index of global self-appraisal (self-esteem).

## Method

### Participants

Sixty-seven female undergraduates participated in exchange for course credit. One woman was excluded from analysis because she failed to complete all self-report measures. The resulting sample consisted of 66 women and had an age range of 18–22 years ( $M = 18.5$ ,  $SD = 0.79$ ). The ethnic breakdown of the sample was as follows: 55 Caucasian (83%), 6 African American (9%), 3 Latino (5%), 1 Asian (2%), and 1 Native American (2%).

### Design and Materials

Participants performed a visual cueing task that included facial photographs of highly attractive women, highly attractive men, average-looking women, and average-looking men. Fifteen exemplars from each category were included, with participants viewing a total of 60 color facial photographs. All photographs were pretested by an independent group of undergraduate students ( $n = 32$ ) for their level of physical attractiveness (1 = *very unattractive* to 9 = *very attractive*). We selected targets based on these ratings to equate levels of perceived attractiveness across target gender. Average ratings were attractive females ( $M = 7.52$ ,  $SD = 1.39$ ), attractive males ( $M = 7.31$ ,  $SD = 1.35$ ), average females ( $M = 4.77$ ,  $SD = 1.61$ ), and average males ( $M = 4.64$ ,  $SD = 1.74$ ). All stimuli were normed for brightness, color, contrast, and size. In addition, stimuli were normed for facial expression. All faces were pre-rated as low in emotional expressiveness (i.e., relatively neutral expression).

### Procedure

Participants were run in individual sessions and were told that the study investigated how quickly people can look at pictures and categorize objects. Before beginning the task, participants completed measures of bulimotypic constructs (e.g., bulimic symptoms, body dissatisfaction, and perfectionism) and self-esteem. After completing these measures, participants began the visual cueing task.

The task was a version of the visual dot probe paradigm.<sup>17,20</sup> This task assesses how efficiently participants are able to shift their attention away from the location of a visual cue to another position on the computer screen. Evidence indicates that people are relatively inefficient at shifting their eyes away from signs of threat (e.g., angry faces, threatening words<sup>18,20</sup>).

The procedure for each trial was as follows. First, a fixation cross (“X”) appeared in the center of the screen for 1,000 ms. Second, a target face was displayed for 500 ms in one quadrant (i.e., upper-left, upper-right, lower-left, lower-right) of the computer screen. Concurrent with the disappearance of the target photo, a categorization object (circle or square) appeared in either the same location as the picture (valid trials) or in a different quadrant (invalid trials). When this object appeared, the participant’s task was to categorize as quickly as possible the object as a circle or square by pressing the “a” or “k” key, respectively, on the keyboard. Participants were instructed to respond as quickly and accurately as possible. The response latency between the appearance of the object and the participant’s response provided a reaction time measure of attentional bias: Larger response latencies indicate that it took the participant longer to shift her attention away from the location at which the target face was pictured.

Only invalid trials (in which the categorization object appeared in a location different from the face) were used to assess attentional bias. As in previous research, valid trials (in which the categorization object appeared in the same spot as the facial cue) were included to encourage participants to keep their attention fixed on the facial cue until it disappeared. If the categorization object were to appear at a different location than the facial cue on every trial, participants might develop the strategy of simply looking elsewhere on the screen as soon as the cue appears, anticipating that the object would always appear somewhere else. Before performing the task, participants were told that for the majority of trials, the position of the face would validly cue the location of the categorization object. In fact, only 25% of the trials were valid trials. To create the sense that the majority of the trials would be valid trials, though, 75% of the practice trials were valid trials.

For each trial, once the participant categorized the object, she was given a 2,000-ms break before the onset

of the next trial. Each participant completed a block of 20 practice trials followed by three blocks of 20 experimental trials. The stimuli for the practice trials consisted of 20 neutral items (e.g., household furniture, eating utensils). Each block of experimental trials consisted of five photographs from each target group (e.g., attractive females) presented in random order. Each block contained 5–6 valid trials and 14–15 invalid trials. The order of valid and invalid trials and object type (circle or square) was randomized across trials. After finishing the visual cueing task, participants were debriefed and excused.

## Measures

**Attentional Measure.** The amount of time (ms) required for participants to respond on invalid trials served as the dependent variable. We averaged responses within target groups to produce separate indices of attention to attractive females, attractive males, average females, and average males. Trials in which the participant incorrectly categorized the object were excluded from analysis (2% of all responses). Average response times in the extreme tail of the distribution ( $>3.0$  SDs above the mean) also were excluded from analysis ( $n = 3$ ). Outliers were distributed equally across target categories.

Consistent with previous research, we observed sizable individual differences in the overall speed of responding: Some participants responded more quickly than others, regardless of the target face. Therefore, we standardized participant's reaction times. To standardize, we centered participants' target-specific reaction times by subtracting each participant's overall mean reaction time (across targets) from the mean reaction time for each target category. The resultant centered reaction time was then divided by the standard deviation of that participant's reaction times. This yielded target-specific  $z$ -scored measures of attention for each participant.

**Eating Disorders Inventory (EDI).** The EDI is a frequently used 64-item self-report measure of eating-related attitudes and traits. It yields eight subscales: Drive for Thinness, Bulimia, Body Dissatisfaction, Ineffectiveness, Perfectionism, Interpersonal Distrust, Interoceptive Awareness, and Maturity Fears. The subscales exhibit adequate internal consistency coefficients and stable test-retest correlations, and have been extensively validated.<sup>23</sup>

The current study focused on the Bulimia, Perfectionism, and Body Dissatisfaction subscales. The Bulimia subscale includes seven items that assess bingeing and purging (e.g., "I stuff myself with food" and "I have the thought of trying to vomit to lose weight"). The coefficient alpha in this sample was .82. The Perfectionism subscale includes six items, designed to measure general perfectionism ("I feel that I must do things perfectly, or not do them at all" and "Only outstanding performance is good enough in my family"). The coefficient alpha in this sample was .83. The

Body Dissatisfaction subscale includes nine items that assess negative beliefs about one's body (e.g., "I think that my stomach is too big" and "I think that my thighs are too large"). The coefficient alpha in this sample was .92. Participants were asked to rate all items on a 1–6 scale (1 = *never*; 2 = *rarely*; 3 = *sometimes*; 4 = *frequently*; 5 = *usually*; 6 = *always*).

**State Self-Esteem Scale (SSES).** The SSES is a frequently used 20-item measure of state self-esteem (e.g., "I feel good about myself" and "I feel that others respect and admire me"). Participants responded using a 1–5 scale (1 = *not at all*; 2 = *a little bit*; 3 = *somewhat*; 4 = *very much*; 5 = *extremely*), based on the extent to which each item described participants' feelings in the moment. The coefficient alpha for this sample was .91.<sup>24</sup>

## Analytic Strategy

We computed the zero-order correlations between attention to each type of target face, and bulimic symptoms, perfectionism, body dissatisfaction, and self-esteem. For any significant association, we tested its resilience by controlling for other variables of interest (e.g., the association between bulimotypic symptoms and attention to attractive female faces, controlling for body dissatisfaction, perfectionism, and self-esteem).

This research was reviewed and approved by an institutional review board.

## Results

Table 1 presents correlations among all study variables, as well as means, standard deviations, standard errors of the mean, and margins of error (for 95% confidence intervals). Initial examination of the data revealed that women who attended more to attractive female faces also attended more to attractive male faces. These women also appeared to attend less to average-looking faces of both genders.

More importantly, women exhibiting bulimotypic symptoms attended preferentially—and selectively—to attractive female faces. Indeed, our primary expectation was confirmed: Bulimotypic symptoms were correlated with biased attention to attractive female faces ( $r = .28$ ,  $p < .05$ ), but not with attention to average female faces, attractive male faces, or average male faces. Moreover, of the self-report variables, the bulimic symptom index was the only one to show a significant correlation with attention to attractive female faces.

We examined further the association between bulimotypic symptoms and attention to attractive



**TABLE 1.** Means, standard deviations, standard errors of the mean, margins of error for 95% confidence intervals, and bivariate correlations for All study variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. Attractive females	—							
2. Attractive males	.42**	—						
3. Average females	-.80**	-.66**	—					
4. Average males	-.69**	-.75**	.47**	—				
5. Bulimic symptoms	.28*	.14	-.20	-.24	—			
6. Perfectionism	.00	.18	-.08	-.09	.09	—		
7. Body dissatisfaction	.12	.14	-.11	-.15	.55**	.21	—	
8. Self-esteem	-.15	-.14	.20	.09	-.53**	-.33**	-.68**	—
<i>N</i>	65	64	66	65	66	66	66	66
<i>M</i>	.21	-.21	.11	-.12	2.02	3.65	3.64	3.59
<i>SD</i>	.91	.81	.87	.81	.73	.97	1.19	.66
<i>SEM</i>	.11	.10	.11	.10	.09	.12	.15	.08
95% margin of error	.22	.20	.22	.20	.18	.24	.30	.16

\*Correlation is significant at the .05 level (2-tailed).

\*\*Correlation is significant at the .01 level (2-tailed).

female faces to see if it was potentially attributable to perfectionistic ideals. Given the near-zero correlation between perfectionism and attention to attractive female faces, it appeared that this association could not be attributed to perfectionistic tendencies. To evaluate this possibility further, however, we calculated the partial correlation between bulimotypic symptoms and attention to attractive female faces, controlling for perfectionism. The partial correlation remained at .28 ( $p < .05$ ), which is the same magnitude as the zero-order association.

Next, we examined whether the association between bulimotypic symptoms and attention to attractive female faces could be attributable to body dissatisfaction resulting from social comparison. Given that the zero-order correlation between body dissatisfaction and attention to attractive female faces was nonsignificant ( $r = .12$ ), this possibility is unlikely. However, to evaluate this possibility thoroughly, we calculated the partial correlation between bulimotypic symptoms and attention to attractive female faces, controlling for body dissatisfaction. The partial correlation was .25,  $p < .05$ , similar to the zero-order association of .28. It is of interest to assess the converse relation, as well—that is, what happens to the association between body dissatisfaction and attention to attractive female faces, controlling for bulimotypic symptoms? This partial correlation was  $-.03$ , which was not significant (NS), compared with the zero-order association of .12. This suggests that any association between body dissatisfaction and attention to attractive female faces is accounted for by the relations of these variables to bulimotypic symptoms.

We also examined whether the attentional bias could be attributable to self-esteem. Given that the zero-order correlation between self-esteem and attention to attractive female faces was nonsignifi-

cant ( $r = -.15$ ), this possibility is unlikely. To evaluate it further, we calculated the partial correlation between bulimotypic symptoms and attention to attractive female faces, controlling for self-esteem. The partial correlation was .24,  $p = .06$ , virtually unchanged from the zero-order association of .28. Here again, it is of interest to determine what happens to the association between self-esteem and attention to attractive female faces, controlling for bulimotypic symptoms? This partial correlation was  $-.001$ , NS, compared to the zero-order association of  $-.15$ . This, again, suggests that any association between self-esteem and attention to attractive female faces is accounted for by the relations of these variables to bulimotypic symptoms.

After initially examining the separate effects of perfectionism, body dissatisfaction, and self-esteem, we were interested in determining whether the association between bulimotypic symptoms and attention to attractive female faces was reduced by the joint effects of perfectionism, body dissatisfaction, and self-esteem. To evaluate this possibility, we calculated the partial correlation between bulimotypic symptoms and attention to attractive female faces, controlling for body dissatisfaction, perfectionism, and self-esteem. The partial correlation was .23,  $p = .068$ , not substantially changed from the zero-order association of .28.

Finally, we examined the magnitude of the attentional bias in women with relatively high levels of bulimic symptomatology. To assess the difference in attentional bias between normal women and women exhibiting evidence of relatively strong bulimic symptomatology, we compared women scoring  $\geq 1$  *SD* above the mean on the bulimia index ( $n = 6$ ,  $M = 3.74$ ,  $SD = 1.04$ ) with other women in the sample ( $n = 60$ ,  $M = 1.84$ ,  $SD = 0.40$ ). This comparison revealed a sizable difference

in attention to attractive women,  $F(1, 63) = 6.57$ ,  $p = .01$ ,  $R^2 = .094$ . Women exhibiting relatively stronger bulimotypic symptoms attended to attractive women to a greater degree ( $M = 1.09$ ,  $SD = 0.39$ ) than other women did ( $M = 0.13$ ,  $SD = 0.91$ ). Indeed, whereas women with relatively strong bulimotypic symptoms attended much more to attractive women than to other types of faces,  $F(1, 5) = 47.75$ ,  $p < .001$ , other women attended equally to attractive female faces compared with other types of faces,  $F(1, 56) = 0.99$ ,  $p = .32$ .

## Conclusion

In the current study, we examined the relation between bulimotypic symptoms and attention to male and female faces. Results indicated that, in a sample of female undergraduates, there was a positive relation between EDI Bulimia scores and attention to attractive female faces. In contrast, no significant associations were observed between bulimotypic symptoms and attention to average female faces, attractive male faces, or average male faces. Thus, women exhibiting bulimotypic symptoms appear to preferentially and selectively attend to images of attractive women. Furthermore, the association between bulimotypic symptoms and attention to attractive female faces was not explained by indices of perfectionism, body dissatisfaction, or general self-esteem. Thus, bulimotypic symptoms are uniquely associated with women's tendency to dwell on attractive female faces. This relation does not appear to be mediated by other bulimotypic constructs.

In the current article, four possible explanations were suggested for an association between bulimic symptoms and attention to attractive female faces. The current findings allowed us to exclude, at least partially, three of the four possibilities: Perfectionism, body dissatisfaction, and general self-esteem were unable to account for the observed attentional bias. One caveat is warranted, however. In the current study, we assessed attention to faces rather than attention to bodies. Therefore, it is possible that the association between bulimotypic symptoms and attention to attractive female faces may have been explained by "face dissatisfaction" (as opposed to body dissatisfaction), if such a construct had been investigated. This seems unlikely, however, for two reasons. First, to our knowledge, differences in face dissatisfaction between bulimic and nonbulimic women have not been documented. Second, any such difference likely would be

highly associated with measures of self-esteem and body dissatisfaction, neither of which accounted for bulimotypic symptom effects in the current study.

That the association between bulimotypic symptoms and attention to attractive faces is not accounted for by body dissatisfaction or self-esteem suggests that appearance-focused social comparison processes may not best explain this attentional bias. Attending to attractive others as a means of assessing one's own level of attractiveness would likely involve one of three motives—self-evaluation, self-improvement, or self-enhancement.<sup>13</sup> We found that greater attention to attractive faces was not related to body dissatisfaction or self-esteem. If an attentional bias to attractive faces involved evaluating the self through social comparison, one would expect upward comparisons to attractive faces to involve the recognition of a discrepancy (i.e., body dissatisfaction) and the experience of negative feelings about the self (i.e., lowered self-esteem).

Another explanation for a link between bulimic symptoms and attention to attractive female faces was not directly tested in the current study. This potential explanation—that women exhibiting bulimotypic symptoms may vigilantly attend to attractive females because those females are viewed as potential competitive threats—should be evaluated more fully in future work. Although speculative, this explanation suggests that the phenomenology of bulimia may involve a salient sense of competition with other women.<sup>25</sup> The female competition hypothesis suggests that women who are insecure in their views of their own bodies (in this case, women with bulimic symptomatology) will manifest particular forms of cognitive vigilance to perceived threats posed by other women (in this case, attention to attractive women's faces).

How this hypothesized vigilance might fit causally into the development and maintenance of bulimotypic symptoms remains to be evaluated with future research. Essential features of bulimia are an overreliance on one's own body shape and weight as sources of self-evaluation and the presence of maladaptive compensatory methods to prevent weight gain.<sup>7</sup> Thus, a theory of bulimic symptomatology ought to explain processes by which women evaluate their bodies as less than acceptable and become disturbed enough by these self-perceptions to engage in compensatory behaviors. One possibility is that the salient perception of sexual threats from other attractive women elicits, in some women, an overdeveloped focus on one's own attractiveness-related character-

istics, including a focus on one's own body. Such a focus might then translate into disordered eating. Conversely, the presence of negative self-evaluative biases associated with disordered eating could make particularly salient attractiveness-related characteristics in other women, as those women are likely to be perceived as potential threats to the self.<sup>15</sup> It is also possible that some combination of these processes is involved, potentially developing into a self-perpetuating cycle of negative self-evaluation, disordered eating, and cognitive vigilance to other attractive women. In the context of bulimia, these processes could serve to escalate symptoms, such that bingeing may serve to assuage the distress associated with a sense that one is not living up to the competitive standards set by other women, whereas purging may reflect attempts to reach those standards. These possibilities were not directly tested in the current study. It remains for future research to specify how such self-focused and other-focused processes might accrue. Nevertheless, such speculation may have important implications for treatment, suggesting possible benefits to cognitive therapy geared toward undermining the tendency to appraise threat perceived in other women.

By placing the conceptualization of disordered eating squarely within a social context, the current study may have valuable implications for the conceptualization and treatment of bulimotypic symptoms. Despite these potential implications, it remains for future research to more fully explore the hypothesized interpersonal processes and their connection to the genesis and maintenance of disordered eating in clinical samples.

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