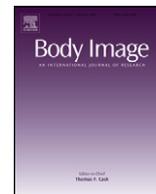




Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Body Image

journal homepage: www.elsevier.com/locate/bodyimage



Multidimensional body image comparisons among patients with eating disorders, body dysmorphic disorder, and clinical controls: A multisite study[☆]

Joshua I. Hrabosky^{a,*}, Thomas F. Cash^b, David Veale^c, Fugen Neziroglu^d, Elizabeth A. Soll^{e,1}, David M. Garner^{e,3}, Melissa Strachan-Kinser^{f,2}, Bette Bakke^g, Laura J. Clauss^h, Katharine A. Phillipsⁱ

^a Department of Psychiatry, Rhode Island Hospital, Providence, RI, USA

^b Department of Psychology, Old Dominion University, Norfolk, VA, USA

^c Institute of Psychiatry, King's College, London, England, UK

^d Bio-Behavioral Institute, Great Neck, NY, USA

^e River Centre Clinic, Sylvania, OH, USA

^f Castlewood Treatment Center, St. Louis, MO, USA

^g St. Cloud Hospital, Women's Specialty Center, St. Cloud, MN, USA

^h The Center for Eating Disorders Management, Inc., Bedford, NH, USA

ⁱ Body Dysmorphic Disorder Program, Butler Hospital/Warren Alpert Medical School of Brown University, Providence, RI, USA

ARTICLE INFO

Article history:

Received 2 January 2009

Received in revised form 10 March 2009

Accepted 15 March 2009

Keywords:

Body image

Body image assessment

Eating disorders

Anorexia nervosa

Bulimia nervosa

Body dysmorphic disorder

ABSTRACT

Body image disturbance is considered a core characteristic of eating disorders and body dysmorphic disorder (BDD), however its definition has been unclear within the literature. This study examined the multidimensional nature of body image functioning among individuals with either anorexia nervosa (AN; $n = 35$), bulimia nervosa (BN; $n = 26$), or BDD ($n = 56$), relative to female ($n = 34$) and male ($n = 36$) psychiatric controls. Participants were recruited from 10 treatment centers in the United States and England and completed psychometrically validated and standardized self-report measures of body image. Overall, the AN, BN, and BDD groups were characterized by significantly elevated disturbances in most body image dimensions relative to their gender-matched clinical controls. There was variability, however, in the comparisons among the three groups of interest, including foci of body dissatisfaction and body image coping patterns. On omnibus indices of body image disturbance and body image quality of life, patients with BDD reported more body image impairment than those with eating disorders. Although AN, BN, and BDD are characterized by body image disturbances, similar and partially distinctive cognitive, behavioral, and emotional elements of body image functioning exist among these groups. The study's empirical and clinical implications are considered.

© 2009 Elsevier Ltd. All rights reserved.

Introduction

Body image is a “multifaceted psychological experience of embodiment” that encompasses evaluative thoughts, beliefs, feelings, and behaviors related to one's own physical appearance (Cash, 2004, p. 1). Based on cognitive-behavioral theory (Cash, 2002a), the degree to which individuals are invested in their appearance depends greatly on the core self-schemas related to their appearance (Cash, Melnyk, & Hrabosky, 2004; Markus, 1977).

These body image self-schemas serve as a cognitive template for one's appearance evaluation and body image emotions. When triggered by contextual events, body image thoughts and emotions prompt adjustive, self-regulatory activities, or coping strategies (Cash, Santos, & Williams, 2005). Disturbances in these cognitive, behavioral, and emotional elements of body image are considered core to the psychopathology of anorexia nervosa (AN), bulimia nervosa (BN), and body dysmorphic disorder (BDD; Cash & Deagle, 1997; Fairburn & Harrison, 2003; Phillips, 1991). However, the existing research has not permitted a comprehensive understanding of the relative degree of disturbance of such aspects of body image among these clinical groups. The purpose of the present study was to compare and elucidate more fully the specific body image disturbances of individuals with AN, BN, and BDD.

Although body image is a multidimensional construct (i.e., consisting of the aforementioned cognitive, behavioral, and emotional elements; Cash & Pruzinsky, 2002), research, especially with eating disorder populations (Cash & Deagle, 1997), has

[☆] Portions of this work were presented at the 40th annual meeting of the Association for Behavioral and Cognitive Therapies, Chicago, Illinois.

* Corresponding author. Tel.: +1 401 444 7323; fax: +1 401 444 7109.

E-mail address: jhrabosky@lifespan.org (J.I. Hrabosky).

¹ Elizabeth Soll is presently located at Division of Health Services Research, Department of Urology, University of Michigan, Ann Arbor, MI, USA.

² Present address: Psychological Network, Inc., St. Charles, MO, USA.

³ Formerly at River Centre Clinic.

focused primarily on the assessment of body image evaluation (i.e., satisfaction–dissatisfaction with body attributes or overall appearance) and perception (i.e., size or shape estimation). Despite the DSM-IV criterion of an “undue influence of body weight or shape on self-evaluation” for AN and BN (American Psychiatric Association APA, 1994, p. 545), past research has relied heavily upon broad measures of body shape/weight *concern* or *dissatisfaction* (Rosen, 1996). Although such instruments offer insight into how individuals experience their bodies, they are limited in their scope of understanding the various aspects of body image. More recently, eating disorder research has targeted other body image dimensions beyond body dissatisfaction, such as shape/weight overvaluation (Geller et al., 1998; Goldfein, Walsh, & Midlarsky, 2000; Hrabosky, Masheb, White, & Grilo, 2007).

Past studies that have directly compared AN and BN groups on measures of body image have produced equivocal results. For example, using silhouettes to assess ideal body size, Williamson, Cubic, and Gleaves (1993) found that women with AN and BN did not differ even when controlling for perceived current body size. Ben-Tovim and Walker (1992) also found no significant differences between AN and BN patients on weight-related and global appearance evaluation. On the other hand, using a more advanced method of assessing ideal body image (i.e., a software image warping system using biometric data based on real body shapes), Tovée, Benson, Emery, Mason, and Cohen-Tovée (2003) found that while individuals with BN did not differ from normal controls in their ideal body shape, patients with AN reported a significantly smaller ideal body shape than both groups. Yet, two studies using the Body Dissatisfaction subscale of the Eating Disorder Inventory (EDI; Garner, Olmsted, & Polivy, 1983) found greater body image dissatisfaction among patients with BN compared to those with AN (Garner, Garfinkel, & O’Shaughnessy, 1985; Ruuska, Kaltiala-Heino, Rantanen, & Koivisto, 2005). On the other hand, Benninghoven, Raykowski, Solzbacher, Kunzendorf, and Jantschek (2007) found no significant difference between patients with AN and BN on the Body Dissatisfaction subscale of the EDI. However, when comparing these groups on the somatomorphic matrix, an assessment of muscularity and body fat of men and women’s body image, Benninghoven et al. found significant differences among the two eating disorder groups and normal controls. Patients with AN displayed little discrepancy between perceived and ideal body images, while those with BN reported significantly greater self-ideal discrepancies than both the AN and normal control groups. In their meta-analysis, Cash and Deagle (1997) concluded that individuals with BN reported substantially greater body dissatisfaction relative to clinical and nonclinical controls on both weight-related and global evaluative measures than did those with AN.

BDD, a less studied disorder characterized by a distressing or impairing preoccupation with an imagined or slight defect in one’s physical appearance (APA, 1994), is an often chronic condition associated with considerable disturbances in psychosocial functioning and quality of life (Grant, Kim, & Eckert, 2002; Phillips, Menard, Fay, & Pagano, 2005; Phillips, Pagano, Menard, & Stout, 2006), as well as psychiatric comorbidity (Phillips, McElroy, Keck, Pope, & Hudson, 1993). Several instruments have been validated for the screening or diagnosis of BDD, assessing numerous body image dimensions. However, little empirical research has delineated the multidimensionality of body image in BDD, particularly in comparison to eating disorders. In fact, to our knowledge, Rosen and Ramirez (1998) performed the only direct comparison of BDD and eating disorder (AN and BN) samples on multiple facets of body image. The researchers found no differences between the two groups in body dissatisfaction, preoccupation, and body checking. However, participants with BDD reported more avoidant behaviors and, on a single item, more negative overall self-evaluation due to physical appearance.

The purpose of the present study was to determine the presence, specificity, and severity of body image disturbances within and among individuals with AN, BN, and BDD, as well as relative to psychiatric controls. Specifically, we aimed to identify the problem areas that distinguish these clinical groups, as well as the degree to which they differ on the assessed body image constructs. As both eating disorders and BDD are characterized by body dissatisfaction and excessive concerns about physical appearance, comparing these groups will permit for a better understanding of each disorder’s pathogenesis. Reflecting a cognitive-behavioral model of body image (Cash, 2002a), our research included measurements of body image evaluation and overweight preoccupation, contextual body image emotions, appearance investment, and strategies for coping with body image threats and challenges. Also included were omnibus measures of body image disturbance and the impact of body image on quality of life.

Method

Participants

We recruited participants with *primary* diagnoses of AN, BN, and BDD, as well as individuals for the clinical control groups upon entry into treatment programs (i.e., individual psychotherapy, group psychotherapy, psychopharmacology, and/or an alternative form of treatment). A diagnosis was considered *primary* if it was the reason for seeking treatment (APA, 1994). Programs from which participants were recruited included 6 outpatient, 1 inpatient, 1 day treatment, 1 residential, and 1 partial hospital program. Programs were located in the Northeastern, Midwestern, and Atlantic Coastal regions of the United States, as well as in London, England. There was no significant difference in the distributions of AN and BN patients across types of treatment programs, $\chi^2(3) = 3.93, ns$. On the other hand, substantially more BDD patients and clinical controls were recruited from outpatient (95% and 71%, respectively) than from inpatient, residential, and day treatment programs (5% and 29%, respectively), $\chi^2(2) = 11.95, p < .01$, Cramer’s $V = .31$.

To be eligible for the study, participants had to be at least 18 years old and have diagnoses based on DSM-IV (APA, 1994) diagnostic criteria. Psychiatric diagnoses were obtained using non-standardized clinical interviews and consultation with the DSM-IV in seven treatment programs, and DSM-based structured clinical interviews (e.g., Structured Clinical Interview for DSM Axis I Disorders; First, Spitzer, Gibbon, & Williams, 1996) in three programs. Clinical controls required a diagnosis of an Axis I psychological disorder other than those with body image impairment as a diagnostic criterion. Excluded were patients diagnosed with a cognitive disorder (e.g., delirium, dementia, or amnesia), primary substance-related disorder, schizophrenia or other psychotic disorder, dissociative disorder, or factitious disorder due to the complexity of these disorders, as well as, in the case of some patient groups (e.g., cognitive disorder), the level of difficulty of completing the questionnaires. History of AN, BN, or BDD was not an exclusion criterion for clinical controls. Patients with a diagnosis of an eating disorder not otherwise specified or with comorbid BDD and eating disorder diagnoses were ineligible. Finally, patients were excluded if they had received more than three outpatient sessions of ongoing treatment or 10 days of inpatient, residential, or day treatment at the time of assessment. While not a standard exclusion criterion, these cutoffs aimed to reduce the confounding influence of psychological or psychopharmacological interventions on patients’ body image. Participants were included in the study regardless of whether or not they had been treated for their current primary diagnosis prior to seeking treatment through the recruitment site.

Data from 187 (93%) of the 201 eligible participants recruited were used in the analyses. Thirteen individuals did not return the

questionnaire packets and one was returned with excessive missing data. The final sample of 134 women and 53 men included the following cohorts: 35 (19%) patients with AN, 26 (14%) patients with BN, 56 (30%) patients with BDD, 34 (18%) female controls, and 36 (19%) male controls. Primary diagnoses of the controls were: obsessive-compulsive disorder (OCD; $n = 34$, 49%), major depressive disorder ($n = 19$, 27%), bipolar I disorder ($n = 7$, 10%), panic disorder ($n = 2$, 3%), post-traumatic stress disorder ($n = 2$, 3%), social phobia ($n = 2$, 3%), bipolar II disorder ($n = 1$, 1%), dysthymia ($n = 1$, 1%), mood disorder NOS ($n = 1$, 1%), and trichotillomania ($n = 1$, 1%). Among the three body image disorders, 57% of patients with AN, 88% of patients with BN, and 37% of patients with BDD had a secondary diagnosis. Among those with a secondary diagnosis, 92% of all patients across the three clinical groups suffered from a mood and/or anxiety disorder.

The AN and BN groups were comprised of women only, whereas the BDD group included both women ($n = 39$, 70%) and men ($n = 17$, 30%). The majority of the sample was White ($n = 164$; 88%). Participants ranged in age from 18 to 63 years ($M = 30.7$, $SD = 11.1$). General linear model (GLM) analysis of variance (ANOVA) with Tukey's HSD post-hoc comparisons revealed that the AN ($M = 26.5$, $SD = 8.7$), BN ($M = 26.7$, $SD = 8.7$), BDD ($M = 29.8$, $SD = 10.0$), and female control ($M = 33.0$, $SD = 12.0$) groups did not statistically differ in mean age, while the BDD and male control ($M = 37.5$, $SD = 11.8$) groups differed significantly, $F(4, 182) = 7.34$, $p < .001$, $\eta^2 = .14$.

Assessment and measures

In this IRB-approved study, the site coordinator or primary clinician obtained written informed consent from each participant. Site coordinators provided the principal investigators (J.I.H. and T.F.C.) with participants' height, weight, and diagnostic information. Questionnaire packets were distributed in pre-addressed and stamped envelopes. Upon completing the questionnaires the participant sealed the envelope, which was mailed to the principal investigators. All data were coded nominally to preserve participants' anonymity. Participants completed the following standardized body image assessments and a demographics form assessing gender, age, race, height, and weight:

Multidimensional Body-Self Relations Questionnaire-Appearance Scales

The MBSRQ-AS is a 34-item attitudinal assessment of body image, using a 5-point disagree-agree response format (Brown, Cash, & Mikulka, 1990; Cash, 2008a). The study used three of the five MBSRQ-AS subscales: The 7-item Appearance Evaluation (AE) subscale assesses positive and negative appraisals of one's physical appearance, with lower scores indicative of more negative evaluative body image. Internal consistency (Cronbach's alpha) of the AE subscale in this study ranged from .85 to .90 among clinical groups. The Overweight Preoccupation (OWP) subscale's four items assess fat anxiety, weight vigilance, dieting, and eating restraint. Higher OWP scores reflect greater preoccupation. Although its internal consistency in this study was adequate in some groups (.80 in the AN group and .78 in the BDD group), it was somewhat weaker in others (.68 in male controls, .63 in female controls, and .54 in the BN group). The 9-item Body Areas Satisfaction Scale (BASS; Giovannelli, Cash, Henson, & Engle, 2008) measures degree of dissatisfaction-satisfaction with specific body areas and attributes, with lower scores indicating greater body dissatisfaction. Its internal consistency in this study ranged from .75 to .86.

Situational Inventory of Body-Image Dysphoria-Short Form

The 20-item SIBID-S (Cash, 2002b, 2008a) measures the 5-point frequency of negative body image emotions in various

situational contexts. Higher scores reflect greater cross-situational distress. In this study, the SIBID-S had high internal consistency (range = .92–.96).

Appearance Schemas Inventory-Revised

The ASI-R (Cash, 2008a; Cash, Melnyk, et al., 2004) is a 20-item measure of investment in one's physical appearance, using a 5-point disagree-agree response format. Higher scores indicate greater investment. The ASI-R consists of two subscales: Self-Evaluative Salience, which assesses dysfunctional beliefs about how one's physical appearance influences one's personal or social worth and sense of self, and Motivational Salience, which assesses the importance one places on being attractive and managing one's appearance. The internal consistency of the Self-Evaluative Salience subscale in this study was acceptable (range = .72–.89). The internal consistency of the Motivational Salience subscale was similarly good in most groups (range = .83–.91), but was lower for the BDD sample ($\alpha = .58$).

Body Image Coping Strategies Inventory

The BICSI (Cash, 2008a; Cash et al., 2005) is a 29-item measure of how individuals cognitively and behaviorally cope with circumstances that threaten their body image. On a 4-point response format, higher scores indicate greater likelihood of engaging in particular coping strategies. The BICSI consists of three subscales: Appearance Fixing includes attempts to change one's appearance through concealing, camouflaging, or correcting perceived imperfections. Avoidance is the attempt to avoid or escape distressing body image situations or experiences. Positive Rational Acceptance entails strategies of acceptance of the event or associated thoughts or emotions, as well as managing them with positive self-care or rational self-talk. In this study, the internal consistencies of the Appearance Fixing (range = .80–.94) and Positive Rational Acceptance (range = .79–.91) subscales were acceptable. Whereas the internal consistency of the Avoidance subscale was good in the male control sample ($\alpha = .89$), it was weaker in the other groups (range = .45–.65). A principal components analysis of the 29 BICSI items with all study participants indicated a 24-item, 4-factor solution. The four factors include the original Appearance Fixing subscale, a slightly shorter Positive Rational Acceptance subscale (α range = .83–.92), an Experiential Avoidance subscale (e.g., "I try to ignore the situation and my feelings;" α range = .57–.79), and a Coping by Eating subscale (e.g., "I react by overeating;" α range = .63–.93).⁴ The internal consistencies of the newly constructed scales either remained high or improved across groups relative to the original subscales.

Body Image Disturbance Questionnaire

The BIDQ (Cash, 2008a; Cash, Phillips, Santos, & Hrabosky, 2004) is a brief self-report assessment derived from the Body Dysmorphic Disorder Questionnaire (Dufresne, Phillips, Vittorio, & Wilkel, 2001; Phillips, 2005), a clinical screening measure of BDD. The BIDQ assesses concern and preoccupation with physical appearance; appearance-related distress; effects of body image concerns on aspects of social, occupational/academic, and role functioning; and avoidant behavior. Based on a 5-point response format, higher scores indicate greater overall body image disturbance. Research supports the reliability and validity of the BIDQ as a body image measure in nonclinical samples (Cash & Grasso, 2005; Cash, Phillips, et al., 2004; Rudiger, Cash, Roehrig, &

⁴ The four factors explained 60.5% of the total variance. The Kaiser-Meyer-Olkin index was 0.86 and the Bartlett's test was highly significant ($p < .001$), supporting the appropriateness of the data for this analysis (Tabachnick & Fidell, 2001b).

Thompson, 2007). The internal consistency in the current study was excellent for all groups (range = .88–.94).

Body Image Quality-of-Life Inventory

The BIQLI (Cash, 2008a; Cash & Fleming, 2002) is a 19-item measure of the effects of body image on multiple facets of psychosocial functioning and well-being. A 7-point (–3 to +3) scale is used to rate the impact, from negative to positive, of body image on such aspects of life as interpersonal relationships, sex life, self-confidence, and self-worth. Lower BIQLI scores reflect a more negative impact of body image on one's quality of life. The internal consistency in this study was excellent for all groups (range = .90–.97).

Statistical analysis plan

GLM ANOVA was performed to compare groups on the study's primary variables. Four sets of ANOVAs were performed. Two sets of one-way between-groups ANOVAs compared female controls with AN and BN groups separately. A 2×2 ANOVA was performed including gender and clinical group (i.e., BDD and controls). Finally, a set of one-way between-groups ANOVAs compared patients with AN, BN, and BDD. Tukey's HSD or Dunnett's C post-hoc comparisons were then performed depending on the results of Levene's Test of Equality of Error Variances. Analysis of covariance (ANCOVA) was performed to control for the variance of age when making direct comparisons between BDD and male controls. ANCOVAs revealed that the differences between these groups remained significant despite controlling for age. Among all group comparisons, the alpha was set at .01 for all omnibus *F* tests, and, where necessary, at .05 for post-hoc comparisons.

Results

Group comparisons on body mass index

Based⁵ on GLM ANOVAs comparing groups on body mass index (BMI = kg/m²),⁶ patients with AN ($M = 16.8$, $SD = 1.9$) had a significantly lower mean BMI than all other clinical groups ($ps < .001$), while those with BN ($M = 22.4$, $SD = 3.0$) had a lower BMI than female controls only ($M = 24.7$, $SD = 5.0$, $p < .05$). Patients with BDD ($M = 22.4$, $SD = 3.2$) had a lower BMI than both male ($M = 26.1$, $SD = 6.0$, $p < .01$) and female controls ($p < .05$).

Group comparisons on body image measures

Table 1 summarizes the results of the four sets of ANOVAs, including *F* values, effect sizes (partial η^2), and degrees of freedom for all body image measures. Table 2 reports descriptive statistics for each of the five groups on all body image measures and how the groups compare based on the ANOVAs given in Table 1.

⁵ Outliers were assessed by creating *z* scores and examining the normal distribution of scoring on all clinical measures. All scores that were found to fall three or more standard deviations beyond the mean, or were more than one standard deviation beyond the next most extreme score, were recalculated to fall no more than one unit larger or smaller than the next most extreme score in the distribution (Tabachnick & Fidell, 2001a).

⁶ BMI was based on either the participant's self-report or the clinical site's report of the participant's height and weight. The default BMI used in the analyses was the clinical site's report, as many programs objectively weighed their patients on an ongoing basis, and therefore were more likely to report more accurate measurements. However, if a site did not report height or weight, self-report was used. Of the 187 participants in this study, BMI was based on the clinical reports of 102 participants, the self-reports of 74 participants (46% BDD, 26% female controls, and 28% male controls), and was missing for 11 participants (10 BDD and 1 male control).

Body image evaluation

The AN, BN, and BDD groups did not statistically differ in their global body image evaluation, as measured by the AE scale. All three groups, however, reported poorer appearance evaluations than their gender-matched controls. Tables 3 and 4 report the results of group comparisons among the individual body areas and attributes comprising the BASS. The two eating disorder groups did not statistically differ in their dissatisfaction with any physical characteristics. Participants with AN reported greater dissatisfaction with all attributes than female controls (except for height, where there were no differences among the five groups), and the BN group also reported greater dissatisfaction with most areas than female controls. The BDD group reported more facial dissatisfaction than all other groups, as well as more discontent with their hair than all groups except for the AN group. Participants with BDD also reported more dissatisfaction with their lower torso and muscle tone than controls. The AN and BN groups reported greater dissatisfaction with their weight and mid torso (waist, stomach) than the BDD group, and while AN patients reported greater dissatisfaction with their lower (buttocks, hips, thighs) and upper (chest, shoulders) torso than BDD patients, BN and BDD patients did not statistically differ in their degree of dissatisfaction of these shape-related areas. Based on patients' qualitative responses on the BIDQ, no BDD patients included weight as an area of concern or fixation, while 13 patients (23%) identified overall body shape or specific aspects of their upper, mid, or lower torso as areas of dissatisfaction. On the BIDQ, all AN and BN patients identified weight, overall body shape, or parts of their upper, mid, or lower torso as primary areas of concern.

Overweight preoccupation

The AN and BN groups reported greater preoccupation with their weight than the BDD or female control groups, whereas the BDD group reported comparable levels of overweight preoccupation relative to gender-matched controls.

Body image emotions

The AN, BN, and BDD groups did not significantly differ in their degree of body image distress, as measured by the SIBID-S. However, all three groups reported greater situational distress than their gender-matched controls.

Appearance investment

The AN, BN, and BDD groups all reported greater investment on the two ASI-R subscales than their gender-matched controls. The BDD group reported greater appearance-managing investment (Motivational Salience) and appearance overvaluation (Self-Evaluative Salience) than the AN group, and only differed from the BN group on the Self-Evaluative Salience subscale, with the BDD group experiencing greater appearance overvaluation than the BN group. The AN and BN groups did not differ on either ASI-R subscale.

Body image coping strategies

All three primary clinical groups reported appearance fixing strategies to a greater extent than controls. The AN and BN groups were statistically comparable on the BICSI Appearance Fixing subscale, as were the BN and BDD groups. However, BDD participants reported coping by appearance fixing more than those with AN. On the Experiential Avoidance subscale, all groups reported similarly limited attempts to avoid body image thoughts and emotions. Participants with BN were more likely to cope with body image stressors by eating (or overeating) than all other groups, including participants with AN, and were less likely to engage in positive rational acceptance than female controls.

Table 1
GLM ANOVAs comparing groups on body image measures.

Measure	Anorexia nervosa vs. female controls		Bulimia nervosa vs. female controls		BDD vs. controls ^a		AN vs. BN vs. BDD	
	F	Partial η^2	F	Partial η^2	F	Partial η^2	F	Partial η^2
Appearance Evaluation	34.20**	.34	18.53**	.24	34.64**	.22	1.03	.02
Overweight Preoccupation	33.93**	.34	46.20**	.44	1.02	.01	23.97**	.30
Situational Inventory of Body-Image Dysphoria	42.61**	.39	45.60**	.44	102.42**	.46	0.46	.01
ASI-R Self-Evaluative Saliency	43.99**	.40	31.63**	.35	160.60**	.57	5.93*	.09
ASI-R Motivational Saliency	8.70*	.12	14.46**	.20	52.68**	.30	5.73*	.09
BICSI Appearance Fixing	17.65**	.21	27.42**	.32	77.53**	.40	5.28*	.09
BICSI Experiential Avoidance	1.51	.02	0.17	.00	1.01	.01	2.27	.04
BICSI Coping by Eating	7.99*	.11	11.46*	.17	0.92	.01	23.44**	.29
BICSI Positive Rational Acceptance	5.70	.08	7.83*	.12	0.89	.01	0.45	.01
Body Image Disturbance	44.94**	.40	48.40**	.46	378.12**	.76	17.67**	.24
Body Image Quality of Life	11.46*	.15	17.04**	.23	114.24**	.49	9.44**	.14
Degrees of freedom	(1, 66) to (1, 67)		(1, 58)		(1, 119) to (1, 122)		(2, 112) to (2, 114)	

^a A 2 × 2 factorial ANOVA was performed including gender and clinical group (i.e., BDD vs. controls). The *F* value reported is the main effect of comparing BDD and controls, as there were no interactions between gender and clinical group.

* *p* < .01.

** *p* < .001.

Body image disturbance and quality of life

Participants with BDD reported greater body image disturbance on the BIDQ and a more deleterious impact of body image on quality of life on the BIQLI than did all other groups. The AN and BN groups did not differ on either measure, yet both groups reported more body image disturbance and poorer body image quality of life than female controls.

Comparisons of BDD and OCD patients

Because BDD has been conceptualized as a variant of OCD (McKay, Neziroglu, & Yaryura-Tobias, 1997) or as an obsessive-compulsive spectrum disorder (Phillips, McElroy, Hudson, & Pope, 1995), we performed 2 × 2 ANOVAs comparing the BDD group with control participants who had a primary diagnosis of OCD (*n* = 34), including gender as a moderating variable. The pattern of results comparing BDD and OCD participants on all body image measures paralleled those comparing BDD and all clinical controls, with effect sizes ranging from .00 to .77.

Discussion

This investigation examined the presence, specificity, and severity of multidimensional body image functioning among treatment-seeking individuals with AN, BN, or BDD. Overall, the eating disorder and BDD groups were characterized by greater body image dissatisfaction, dysphoria, investment, and disturbance relative to gender-matched clinical controls. The body image experiences of the former groups also had a more deleterious

⁵ Outliers were assessed by creating *z* scores and examining the normal distribution of scoring on all clinical measures. All scores that were found to fall three or more standard deviations beyond the mean, or were more than one standard deviation beyond the next most extreme score, were recalculated to fall no more than one unit larger or smaller than the next most extreme score in the distribution (Tabachnick & Fidell, 2001a).

⁶ BMI was based on either the participant's self-report or the clinical site's report of the participant's height and weight. The default BMI used in the analyses was the clinical site's report, as many programs objectively weighed their patients on an ongoing basis, and therefore were more likely to report more accurate measurements. However, if a site did not report height or weight, self-report was used. Of the 187 participants in this study, BMI was based on the clinical reports of 102 participants, the self-reports of 74 participants (46% BDD, 26% female controls, and 28% male controls), and was missing for 11 participants (10 BDD and 1 male control).

Table 2
Group descriptive statistics and comparisons on body image measures.

Measure	Anorexia nervosa	Bulimia nervosa	BDD	Female controls	Male controls
Appearance Evaluation					
<i>M</i>	1.98 _a	2.22 _a	2.23 _a	3.17 _b	3.18 _b
<i>SD</i>	0.79	0.81	0.85	0.88	0.87
Overweight Preoccupation					
<i>M</i>	3.93 _a	4.13 _a	2.81 _b	2.69 _b	2.33 _b
<i>SD</i>	0.85	0.67	1.09	0.91	0.97
Situational Inventory of Body-Image Dysphoria					
<i>M</i>	3.21 _a	3.36 _a	3.22 _a	1.95 _b	1.25 _c
<i>SD</i>	0.67	0.61	0.71	0.93	0.86
ASI-R Self-Evaluative Saliency					
<i>M</i>	4.22 _a	4.19 _a	4.51 _b	3.15 _c	2.84 _c
<i>SD</i>	0.52	0.58	0.40	0.80	0.71
ASI-R Motivational Saliency					
<i>M</i>	3.96 _a	4.13 _{a,b}	4.37 _b	3.49 _c	3.33 _c
<i>SD</i>	0.68	0.65	0.45	0.66	0.93
BICSI Appearance Fixing					
<i>M</i>	2.12 _a	2.28 _{a,b}	2.47 _b	1.53 _c	1.10 _c
<i>SD</i>	0.55	0.45	0.47	0.62	0.89
BICSI Experiential Avoidance					
<i>M</i>	1.73	1.37	1.34	1.46	0.98
<i>SD</i>	1.01	0.88	0.78	0.82	0.80
BICSI Coping by Eating					
<i>M</i>	0.58 _a	2.00 _b	1.04 _c	1.13 _c	0.58 _a
<i>SD</i>	0.61	1.00	0.82	0.97	0.86
BICSI Positive Rational Acceptance					
<i>M</i>	1.01 _a	0.93 _a	1.06 _{a,b}	1.32 _b	1.06 _b
<i>SD</i>	0.53	0.53	0.56	0.53	0.67
Body Image Disturbance					
<i>M</i>	3.39 _a	3.52 _a	4.30 _b	1.92 _c	1.62 _c
<i>SD</i>	0.93	0.88	0.62	0.88	0.56
Body Image Quality of Life					
<i>M</i>	−.95 _a	−1.15 _a	−1.81 _b	0.06 _c	0.40 _c
<i>SD</i>	1.30	1.07	0.68	1.16	1.21

Note: Row means that do not share subscripts differ significantly at *p* < .05 or less. Group differences are based on four specific ANOVAs comparing (1) AN and female controls; (2) BN and female controls; (3) BDD, female controls, and male controls; and (4) AN, BN, and BDD. AN and BN groups were not directly compared with male controls. Therefore, where subscripts differ between AN and BN groups and male controls, the difference is not based on statistical comparisons.

impact on their psychosocial quality of life. Moreover, some reliable differences were evident among the AN, BN, and BDD groups—particularly in the foci of their appearance-related concerns, the extremity of their body image investment, and the severity of their body image disturbance and quality-of-life impairment. The results indicate that although AN, BN, and BDD are clearly characterized by problematic body image functioning, they experience both similar and partially distinctive cognitive, behavioral, and emotional body image difficulties.

Body image functioning in AN and BN

Whereas the patients with eating disorders exhibited consistent differences relative to clinical controls, comparisons of the AN and BN groups revealed few statistically reliable distinctions on the study's body image measures. In fact, the only distinction between the AN and BN samples was found within the different patterns of coping with body image threats or challenges. Although the two groups reported statistically comparable levels of appearance fixing, experiential avoidance, and positive rational acceptance, participants with BN were, as expected, more likely to cope with body image-related stress by eating (or overeating), as AN is characterized by extreme caloric restriction (Fairburn & Harrison, 2003). Therefore, the latter group may be more likely to try to fix or camouflage their perceived imperfections or try to ignore distressing thoughts or emotions in an effort to cope with body image-related triggers rather than eat. Regardless, these maladaptive coping strategies are potential expressions of the self-evaluative appearance investment, or overvaluation (Shafran, Fairburn, Robinson, & Lask, 2004), that characterizes AN and BN, and which subsequently reinforces eating disordered attitudes (Engel et al., 2006). Individuals presenting to treatment with AN or BN reported comparable degrees of body image dissatisfaction, distress, (overweight) preoccupation, as well as body image investment, disturbance, and quality of life. These results both support and extend previous studies finding comparable degrees of appearance evaluation between these two clinical groups (e.g., Ben-Tovim & Walker, 1992; Williamson et al., 1993), while refuting others that found group differences based on self-report (e.g., Garner et al., 1985; Ruuska et al., 2005) or schematic figural measures (e.g., Benninghoven et al., 2007; Tovée et al., 2003) of appearance evaluation. Furthermore, these results conflict with those of Cash and Deagle (1997) meta-analysis, which found greater overall body dissatisfaction among BN versus AN patients. These conflicting findings may be a product of the distinct

measures used among these studies, or differences in the power to detect relatively small differences between BN and AN patients.

Body image functioning in BDD

The BDD group reported greater overall body dissatisfaction than clinical controls, but was comparable to the eating disorder groups. Participants with BDD reported greater dissatisfaction with their face and hair than gender-matched controls, paralleling the findings of Phillips et al. (1993). Indeed, the facial dissatisfaction of the BDD group relative to clinical controls reflected the largest effect size (partial $\eta^2 = .47$) among all the group comparisons on specific physical characteristics. Further, as was similarly found by Rosen and Ramirez (1998), in general, body weight/shape was of less concern for patients with BDD in comparison to the eating disorder groups.

Interestingly, however, participants with BDD reported greater self-evaluative and appearance-managing investment than those with an eating disorder. While research has begun to address the clinical implications of appearance investment in eating disorders, including the relationship between shape/weight overvaluation and psychopathology, psychosocial functioning, and quality of life in patients suffering from an eating disorder (e.g., Goldfein et al., 2000; Hrabosky et al., 2007), no known research has examined these relationships in BDD. Although previous research has clearly demonstrated the negative impact of BDD on social and occupational functioning, as well as quality of life, further research is necessary to identify the clinical implications of appearance investment in this disorder. In nonclinical samples, high levels of self-evaluative body image investment are clearly associated with cognitive distortions or biases in information processing (Jakatdar, Cash, & Engle, 2006) and with vulnerability to dysphoric body image states in everyday life contexts (Melnyk, Cash, & Janda, 2004; Rudiger et al., 2007) and in response to media exposure (Ip & Jarry, 2008).

Participants with BDD were more likely than those with an eating disorder to engage in appearance fixing behaviors such as covering up their perceived imperfections, thinking of ways to change their appearance, reassurance seeking, and mirror checking. Indeed, these patients often seek appearance-modifying procedures from cosmetic surgeons and dermatologists (Crerand, Phillips, Menard, & Fay, 2005; Sarwer & Crerand, 2008). Our results support past findings that individuals with BDD engage in repetitive behaviors in an effort to improve, receive reassurance about, or hide the perceived imperfection (Phillips, McElroy, Keck,

Table 3
GLM ANOVAs comparing groups on Body Areas Satisfaction Scale items.

Measure	Anorexia nervosa vs. female controls		Bulimia nervosa vs. female controls		BDD vs. controls ^a		AN vs. BN vs. BDD	
	F	Partial η^2	F	Partial η^2	F	Partial η^2	F	Partial η^2
Face	18.59**	.22	6.20	.10	109.68**	.47	18.53**	.25
Hair	10.18*	.13	0.30	.01	17.80**	.13	5.33*	.09
Lower torso	23.51**	.26	8.94*	.13	6.44	.05	7.92*	.12
Mid torso	11.70**	.15	17.19**	.23	0.03	.00	14.14**	.20
Upper torso	23.87**	.26	10.48*	.15	5.17	.04	5.92*	.09
Muscle tone	14.25**	.18	7.53*	.12	7.94*	.06	2.09	.04
Weight	15.28**	.19	16.69**	.22	0.12	.00	10.77**	.16
Height	0.50	.01	1.89	.03	3.13	.03	1.17	.02
Overall appearance	34.87**	.34	25.29**	.30	50.07**	.29	0.78	.01
Degrees of freedom	(1, 67)		(1, 58)		(1, 122)		(2, 114)	

^a A 2 × 2 factorial ANOVA was performed including gender and clinical group (i.e., BDD vs. controls). The F value reported is the main effect of comparing BDD and controls, as there were no interactions between gender and clinical group.

* $p < .01$.

** $p < .001$.

Table 4
Group descriptive statistics and comparisons on Body Areas Satisfaction Scale items.

Measure	Anorexia nervosa	Bulimia nervosa	BDD	Female controls	Male controls
Face					
M	2.60 _a	2.96 _{a,c}	1.63 _b	3.65 _c	3.64 _c
SD	0.98	1.08	1.04	1.04	0.93
Hair					
M	2.89 _{a,b}	3.54 _{a,c}	2.64 _b	3.68 _c	3.58 _c
SD	1.08	0.95	1.29	0.98	1.11
Lower torso					
M	1.51 _a	1.81 _{a,b}	2.41 _{b,c}	2.71 _c	3.42 _d
SD	0.82	1.10	1.22	1.19	1.02
Mid torso					
M	1.60 _a	1.38 _a	2.45 _b	2.47 _b	2.58 _b
SD	0.88	0.64	1.13	1.21	1.18
Upper torso					
M	1.86 _a	2.19 _{a,b}	2.61 _{b,c}	3.15 _c	3.06 _c
SD	0.91	0.94	1.12	1.26	1.26
Muscle tone					
M	1.97 _a	2.19 _{a,b}	2.43 _{a,b}	2.91 _c	3.06 _c
SD	1.04	0.98	1.08	1.03	1.15
Weight					
M	1.80 _a	1.62 _a	2.63 _b	2.85 _b	2.67 _b
SD	0.93	0.98	1.17	1.28	1.12
Height					
M	3.63	3.38	3.27	3.79	3.61
SD	0.97	1.33	1.05	0.98	1.23
Overall appearance					
M	2.26 _a	2.31 _a	2.05 _a	3.50 _b	3.31 _b
SD	0.85	0.93	1.09	0.90	0.98

Note: Row means that do not share subscripts differ significantly at $p < .05$ or less. Group differences are based on four specific ANOVAs comparing (1) AN and female controls; (2) BN and female controls; (3) BDD, female controls, and male controls; and (4) AN, BN, and BDD. AN and BN groups were not directly compared with male controls. Therefore, where subscripts differ between AN and BN groups and male controls, the difference is not based on statistical comparisons.

Hudson, & Pope, 1994; Veale & Riley, 2001). Based on their cognitive-behavioral model of BDD, Neziroglu, Khemlani-Patel, & Veale (2008) contend that such safety behaviors as mirror checking and camouflaging “may briefly decrease distress or uncertainty but are counter-productive and increase self-consciousness, preoccupation and distress” (p. 120).

The BDD sample reported little coping by avoiding thoughts and feelings. These results support the findings of Phillips, Gunderson, Mallya, McElroy, and Carter (1998), who found that individuals with BDD made only “some” to “little” effort to resist BDD obsessions. Such attempts at ignoring or suppressing intrusive thoughts about one’s perceived physical defect are typically unsuccessful and may paradoxically increase the frequency of intrusive thoughts (Veale, 2004). Instead, individuals with BDD are more likely to engage in purposeful cognitive strategies in an effort to cope or problem-solve, such as rumination, worry, or appearance comparisons, all of which also maintain preoccupation and distress (Neziroglu et al., 2008). As discussed above, we found that for persons with BDD, body image threats provoke appearance checking/fixing behaviors in an effort to cope with their distress.

The BDD group was uniquely characterized by greater overall body image disturbance and negative influence of body image on various areas of life than the eating disorder and clinical control groups. Although the AN and BN groups, in general, reported greater overall disturbance and worse body image quality of life than controls, it appears that the former patients do not experience as much dysfunctional impairment as patients with BDD. In fact,

among all comparisons among the three primary groups and clinical controls, the BDD group’s level of body image disturbance on the BIDQ clearly represented the study’s largest effect size (partial $\eta^2 = .76$). Moreover, our finding of such poor quality of life in patients with BDD (partial $\eta^2 = .49$ on the BIQLI) is consistent with previous studies, in which BDD patients experienced a markedly poorer quality of life than the general population, as well as patients with diabetes, a recent myocardial infarction, or clinical depression (Phillips, 2000; Phillips et al., 2005). Our results indicate that it is possible that individuals with BDD may experience substantially greater psychosocial dysfunction and impairment as a result of their body image than those suffering from an eating disorder, while future studies are needed to confirm this finding. Alternatively, while patients with an eating disorder acknowledge the negative influence of their body image on their lives, they may feel that their maladaptive behaviors (e.g., eating, exercising, purging), interpersonal deficits, and emotion dysregulation also adversely impact their quality of life. Individuals with BDD, on the other hand, may view their negative body image as central to their psychopathology, and therefore attribute any or all psychosocial disturbances and dysfunction to their body image. Additionally, it remains unclear which particular body image-related aspects of BDD are associated with greater impairment and dysfunction. Identifying such a hierarchy will likely inform treatment.

Scientific strengths and limitations

A key strength of this investigation is its unique use of well-validated assessments of body image as a multidimensional construct applied to eating disorders and BDD. One of the major shortfalls in the body image literature is the exclusive reliance on measures of appearance evaluation or weight/shape concern to assess body image attitudes, neglecting the multiple dimensions (i.e., dysphoria, appearance investment, behavioral coping strategies) of this construct, as well as the degree to which body image impacts quality of life. Another major strength of this study was the recruitment of participants from a wide array of treatment settings and locations. Participants from this study were from inpatient, outpatient, day treatment, partial hospital, and residential programs located in diverse areas of the United States and in London, England. Our use of clinical controls with a range of psychopathologies also has advantages over the use of nonclinical comparison groups.

Along with the contributions of this study, several potential limitations are noteworthy. The sizes of the study’s clinical samples were admittedly small. Consequently, with alpha set at .01 for all omnibus F tests, relatively small effects (partial $\eta^2 \leq .05$) were likely not detected, especially for comparisons involving the AN and BN patient groups. Nonetheless, medium effects (partial $\eta^2 \geq .10$) were reliably detected. While generally acceptable, the internal consistencies of some measures varied by group and were sometimes lower than the levels typically found in nonclinical samples (Cash, 2008a; Cash & Grasso, 2005). Such findings may be due to disparities between clinical and nonclinical populations, as the current study represents one of the first empirical evaluations of these measures in a psychiatric sample. Another notable limitation is that 95% of the BDD sample was recruited from outpatient programs, while 80% of the AN sample and 58% of the BN sample were receiving services at day treatment, residential, and inpatient settings. Finally, despite the contribution of this study to the understanding of body image functioning in AN, BN and BDD, the cross-sectional design employed precludes any interpretations of the comparative etiology and causal pathways of the multiple body image dimensions in these groups. Prospective research designs and causal modeling approaches would facilitate the evaluation of

such interpretations. Future research should also explore “real-time” examinations of body image thoughts and behavior through the use of ecological momentary assessments. Performance of such research both within a single clinical group (e.g., BDD only) or across groups (e.g., AN vs. BN vs. BDD) will allow for greater expansion upon our current knowledge of the body image experiences of these clinical groups.

Conclusions and clinical implications

Although both BDD and eating disorders are characterized by severe body image disturbance, this study suggests that there are some clinically relevant differences between these disorders. Both disorders were characterized by similar degrees of body dissatisfaction and distress, but the eating disorder and BDD groups differed in specific foci of dissatisfaction and preoccupation. Consistent with Cash (2002a) cognitive-behavioral perspective, participants with eating disorders or BDD were more likely to engage in certain maladaptive coping strategies for managing body image distress. These behaviors become negatively reinforced, as they may temporarily reduce the dysphoria individuals experience when faced with body image threats, increasing the probability that the behavior will persist (Cash, 2002a; Cash et al., 2005; Neziroglu et al., 2008).

Our results suggest that treatment of body image problems in eating disorders and BDD must go beyond helping individuals become more satisfied with their appearance. Such treatment needs to target core self-schemas around the importance, or overvaluation, of achieving some internalized ideal of attractiveness, as well as focus on problematic appearance fixing and avoidant behaviors (Cash, 2008b; Jarry & Ip, 2005; Neziroglu et al., 2008). Cognitive restructuring, exposure and response prevention, and behavioral experiments have been empirically supported as effective strategies in improving body dissatisfaction, distress, and avoidant behaviors in eating disorder (Hilbert & Tuschen-Caffier, 2004; Key, George, & Beattie, 2002) and BDD samples (Neziroglu et al., 2008; Williams, Hadjistavropoulos, & Sharpe, 2006). Our findings highlight the importance of incorporating multiple body image dimensions, beyond simple body satisfaction measures, in treatment outcome research.

Acknowledgments

The authors thank Barbara Cubic and Richard Handel at the Center for Cognitive Therapy at Eastern Virginia Medical School and Julie Desai at the River Centre Clinic for their collaboration and assistance.

References

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Benninghoven, D., Raykowski, L., Solzbacher, S., Kunzendorf, S., & Jantschek, G. (2007). Body image of patients with anorexia nervosa, bulimia nervosa and female control subjects: A comparison with male ideals of female attractiveness. *Body Image: An International Journal of Research*, 4, 51–59.
- Ben-Tovim, D. I., & Walker, M. K. (1992). A quantitative study of body-related attitudes in patients with anorexia and bulimia nervosa. *Psychological Medicine*, 22, 961–969.
- Brown, T. A., Cash, T. F., & Mikulka, P. J. (1990). Attitudinal body-image assessment: Factor analysis of the Body-Self Relations Questionnaire. *Journal of Personality Assessment*, 55, 135–144.
- Cash, T. F. (2002a). Cognitive behavioral perspectives on body image. In T. F. Cash & T. Pruzinsky (Eds.), *Body image: A handbook of theory, research and clinical practice* (pp. 38–46). New York: Guilford Press.
- Cash, T. F. (2002b). The Situational Inventory of Body-Image Dysphoria: Psychometric evidence and development of a short form. *International Journal of Eating Disorders*, 32, 362–366.
- Cash, T. F. (2004). Body image: Past, present, and future. *Body Image: An International Journal of Research*, 1, 1–5.

- Cash, T. F. (2008a). *Body image assessments: Manuals and questionnaires*. Available from the author's web site at <http://www.body-images.com>.
- Cash, T. F. (2008b). *The body image workbook* (second edition). Oakland, CA: New Harbinger.
- Cash, T. F., & Deagle, E. A., III (1997). The nature and extent of body-image disturbance in anorexia nervosa and bulimia nervosa: A meta-analysis. *International Journal of Eating Disorders*, 22, 107–125.
- Cash, T. F., & Fleming, E. C. (2002). The impact of body image experiences: Development of the Body Image Quality of Life Inventory. *International Journal of Eating Disorders*, 31, 455–460.
- Cash, T. F., & Grasso, K. (2005). The norms and stability of new measures of the multidimensional body image construct. *Body Image: An International Journal of Research*, 2, 199–203.
- Cash, T. F., Melnyk, S. E., & Hrabosky, J. I. (2004a). The assessment of body investment: An extensive revision of the Appearance Schemas Inventory. *International Journal of Eating Disorders*, 35, 305–316.
- Cash, T. F., Phillips, K. A., Santos, M. T., & Hrabosky, J. I. (2004b). Measuring “negative body image:” Validation of the Body Image Disturbance Questionnaire in a non-clinical population. *Body Image: An International Journal of Research*, 1, 363–372.
- Cash, T. F., & Pruzinsky, T. (Eds.). (2002). *Body image: A handbook of theory, research and clinical practice*. New York: Guilford Press.
- Cash, T. F., Santos, M. T., & Williams, E. F. (2005). Coping with body-image threats and challenges: Validation of the Body Image Coping Strategies Inventory. *Journal of Psychosomatic Research*, 58, 191–199.
- Creerand, C. E., Phillips, K. A., Menard, W., & Fay, C. (2005). Nonpsychiatric medical treatment of body dysmorphic disorder. *Psychosomatics*, 46, 549–555.
- Dufresne, R. G., Phillips, K. A., Vittorio, C. C., & Wilkel, C. S. (2001). A screening questionnaire for body dysmorphic disorder in a cosmetic dermatologic surgery practice. *Dermatologic Surgery*, 27, 457–462.
- Engel, S. G., Robinson, M. D., Wonderlich, S. J., Meier, B. P., Wonderlich, S. A., Crosby, R. D., et al. (2006). Does the avoidance of body and shape concerns reinforce eating disordered attitudes? Evidence from a manipulation study. *Eating Behaviors*, 7, 368–374.
- Fairburn, C. G., & Harrison, P. J. (2003). Eating disorders. *Lancet*, 361, 407–416.
- First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1996). *Structured Clinical Interview for DSM-IV Axis I Disorders - Patient Version (SCID-I/P)*. New York: NYSPI.
- Garner, D. M., Garfinkel, P. E., & O'Shaughnessy, M. (1985). The validity of the distinction between bulimia with and without anorexia nervosa. *American Journal of Psychiatry*, 142, 581–587.
- Garner, D. M., Olmsted, M. P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders*, 2, 15–34.
- Geller, J., Johnston, C., Madsen, K., Goldner, E. M., Remick, R. A., & Birmingham, C. L. (1998). Shape- and weight-based self-esteem and the eating disorders. *International Journal of Eating Disorders*, 24, 285–298.
- Giovanelli, T. S., Cash, T. F., Henson, J. M., & Engle, E. K. (2008). The measurement of body image satisfaction-dissatisfaction: Is rating importance important? *Body Image: An International Journal of Research*, 5, 216–223.
- Goldfein, J. A., Walsh, B. T., & Midlarsky, E. (2000). Influence of shape and weight on self-evaluation in bulimia nervosa. *International Journal of Eating Disorders*, 27, 435–445.
- Grant, J. E., Kim, S. W., & Eckert, E. D. (2002). Body dysmorphic disorder in patients with anorexia nervosa: Prevalence, clinical features, and delusional quality of body image. *International Journal of Eating Disorders*, 32, 291–300.
- Hilbert, A., & Tuschen-Caffier, B. (2004). Body image interventions in cognitive-behavioral therapy of binge-eating disorder: A component analysis. *Behaviour Research and Therapy*, 42, 1325–1339.
- Hrabosky, J. I., Masheb, R. M., White, M. A., & Grilo, C. M. (2007). Overvaluation of shape and weight in binge eating disorder. *Journal of Consulting and Clinical Psychology*, 75, 175–180.
- Ip, K., & Jarry, J. L. (2008). Investment in body image for self-definition results in greater vulnerability to the thin media than does investment in appearance management. *Body Image: An International Journal of Research*, 5, 59–69.
- Jakatdar, T. A., Cash, T. F., & Engle, E. K. (2006). Body-image thought processes: The development and initial validation of the Assessment of Body-Image Cognitive Distortions. *Body Image: An International Journal of Research*, 3, 325–333.
- Jarry, J. L., & Ip, K. (2005). The effectiveness of stand-alone cognitive-behavioral therapy for body image: A meta-analysis. *Body Image: An International Journal of Research*, 2, 317–331.
- Key, A., George, C., & Beattie, D. (2002). Body image treatment within an inpatient program for anorexia nervosa: The role of mirror exposure in the desensitization process. *International Journal of Eating Disorders*, 31, 185–190.
- Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology*, 35, 63–78.
- McKay, D., Neziroglu, F., & Yaryura-Tobias, J. A. (1997). Comparison of clinical characteristics in obsessive-compulsive disorder and body dysmorphic disorder. *Journal of Anxiety Disorders*, 11, 447–454.
- Melnyk, S., Cash, T. F., & Janda, L. (2004). Body image ups and downs: Prediction of intra-individual level and variability of women's daily body image experiences. *Body Image: An International Journal of Research*, 1, 225–235.
- Neziroglu, F., Khemlani-Patel, S., & Veale, D. (2008). Social learning theory and cognitive behavioral models of body dysmorphic disorder. *Body Image: An International Journal of Research*, 5, 28–38.
- Phillips, K. A. (1991). Body dysmorphic disorder: The distress of imagined ugliness. *American Journal of Psychiatry*, 148, 1138–1149.
- Phillips, K. A. (2000). Quality of life for patients with body dysmorphic disorder. *Journal of Nervous and Mental Disease*, 188, 170–175.

- Phillips, K. A. (2005). *The broken mirror: Understanding and treating body dysmorphic disorder* (revised and expanded edition). New York: Oxford University Press.
- Phillips, K. A., Gunderson, C. G., Mallya, G., McElroy, S. L., & Carter, W. (1998). A comparison study of body dysmorphic disorder and obsessive-compulsive disorder. *Journal of Clinical Psychiatry*, *59*, 568–575.
- Phillips, K. A., McElroy, S. L., Hudson, J. I., & Pope, H. G. (1995). Body dysmorphic disorder: An obsessive-compulsive spectrum disorder, a form of affective spectrum disorder, or both? *Journal of Clinical Psychiatry*, *56*, 41–51.
- Phillips, K. A., McElroy, S. L., Keck, P. E., Hudson, J. I., & Pope, H. G. (1994). A comparison of delusional and nondelusional body dysmorphic disorder in 100 cases. *Psychopharmacology Bulletin*, *30*, 179–186.
- Phillips, K. A., McElroy, S. L., Keck, P. E., Pope, H. G., & Hudson, J. I. (1993). Body dysmorphic disorder: 30 cases of imagined ugliness. *American Journal of Psychiatry*, *150*, 302–308.
- Phillips, K. A., Menard, W., Fay, C., & Pagano, M. E. (2005). Psychosocial functioning and quality of life in body dysmorphic disorder. *Comprehensive Psychiatry*, *46*, 254–260.
- Phillips, K. A., Pagano, M. E., Menard, W., & Stout, R. L. (2006). A 12-month follow-up study of the course of body dysmorphic disorder. *American Journal of Psychiatry*, *163*, 907–912.
- Rosen, J. C. (1996). Body image assessment and treatment in controlled studies of eating disorders. *International Journal of Eating Disorders*, *20*, 331–343.
- Rosen, J. C., & Ramirez, E. (1998). A comparison of eating disorders and body dysmorphic disorder on body image and psychological adjustment. *Journal of Psychosomatic Research*, *44*, 441–449.
- Rudiger, J. A., Cash, T. F., Roehrig, M., & Thompson, J. K. (2007). Day-to-day body-image states: Prospective predictors of intra-individual level and variability. *Body Image: An International Journal of Research*, *4*, 1–9.
- Ruuska, J., Kaltiala-Heino, R., Rantanen, P., & Koivisto, A. M. (2005). Are there differences in the attitudinal body image between adolescent anorexia nervosa and bulimia nervosa? *Eating and Weight Disorders*, *10*, 98–106.
- Sarwer, D. B., & Crerand, C. E. (2008). Body dysmorphic disorder and appearance enhancing medical treatments. *Body Image: An International Journal of Research*, *5*, 50–58.
- Shafran, R., Fairburn, C. G., Robinson, P., & Lask, B. (2004). Body checking and its avoidance in eating disorders. *International Journal of Eating Disorders*, *35*, 93–101.
- Tabachnick, B. G., & Fidell, L. S. (2001a). *Computer-assisted research design and analysis*. Boston: Allyn and Bacon.
- Tabachnick, B. G., & Fidell, L. S. (2001b). *Using multivariate statistics* (Fourth ed.). Boston: Allyn and Bacon.
- Tovée, M. J., Benson, P. J., Emery, J. L., Mason, S. M., & Cohen-Tovée, E. M. (2003). Measurement of body size and shape perception in eating-disordered and control observers using body-shape software. *British Journal of Psychology*, *94*, 501–516.
- Veale, D. (2004). Advances in a cognitive behavioural model of body dysmorphic disorder. *Body Image: An International Journal of Research*, *1*, 113–125.
- Veale, D., & Riley, S. (2001). Mirror, mirror on the wall, who is the ugliest of them all? The psychopathology of mirror gazing in body dysmorphic disorder. *Behaviour Research and Therapy*, *39*, 1381–1393.
- Williams, J., Hadjistavropoulos, T., & Sharpe, D. (2006). A meta-analysis of psychological and pharmacological treatments for body dysmorphic disorder. *Behaviour Research and Therapy*, *44*, 99–111.
- Williamson, D. A., Cubic, B. A., & Gleaves, D. H. (1993). Equivalence of body image disturbances in anorexia and bulimia nervosa. *Journal of Abnormal Psychology*, *102*, 177–180.