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Overvaluation of Shape and Weight in Binge Eating Disorder, Bulimia Nervosa, and Sub-threshold Bulimia Nervosa

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Abstract

Increasing empirical evidence supports the validity of binge eating disorder (BED), a research diagnosis in the appendix of DSM-IV, and its inclusion as a distinct and formal diagnosis in the *DSM-V*. A pressing question regarding the specific criteria for BED diagnosis is whether, like bulimia nervosa (BN), it should be characterized by overvaluation of shape and weight. This study compared features of eating disorders in 436 treatment-seeking women comprising four groups: 195 BED participants who overvalue their shape/weight, 129 BED participants with subclinical levels of overvaluation, 61 BN participants, and 51 participants with sub-threshold BN. The BED clinical overvaluation group had significantly higher levels of specific eating disorder psychopathology than the three other groups which did not differ significantly from each other. Findings suggest that overvaluation of shape and weight should not be considered as a required criterion for BED because this would exclude a substantial proportion of BED patients with clinically significant problems. Rather, overvaluation of shape and weight warrants consideration either as a diagnostic specifier or as a dimensional severity rating as it provides important information about severity within BED.

Keywords

shape and weight concerns; binge eating disorder; bulimia nervosa; obesity; body image

Binge eating disorder (BED), a research category in the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; *DSM-IV*; American Psychiatric Association [APA], 1994), is characterized by recurrent binge eating without inappropriate compensatory weight-control behaviors. BED is more prevalent than the two formal eating disorders (ED), bulimia nervosa (BN) and anorexia nervosa (AN) (Hudson, Hiripi, Pope, & Kessler, 2007). A recent critical review of the literature concluded that sufficient empirical evidence exists for BED to warrant its inclusion as a distinct and formal ED in the *DSM-V* (Striegel-Moore & Franko, 2008).

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As we move toward the *DSM-V* (Brown & Barlow, 2005; Wilfley, Bishop, Wilson, & Agras, 2007), a pressing question regarding BED is whether revision to its criteria would improve the construct (Masheb & Grilo, 2000). *DSM-IV* criteria for BN and AN, but not for BED, require the presence of overvaluation of shape or weight, or the “undue influence of body weight or shape on self-evaluation” (APA, 1994, p. 545). The few available data suggest that patients with BED are similar to those with BN and AN in their shape/weight concerns (Masheb & Grilo, 2000; Wilfley, Schwartz, Spurrell, & Fairburn, 2000). Hrabosky and colleagues (2007), in a study of 399 patients with BED assessed with the Eating Disorder Examination (EDE; Fairburn & Cooper, 1993), found that overvaluation levels were strongly associated with ED psychopathology and that patients categorized with clinical overvaluation (i.e., shape/weight high on the list of things that influence self-evaluation) reported significantly greater eating-related and general psychological disturbances than those with subclinical overvaluation. Masheb and Grilo (2008) reported that baseline levels of overvaluation of shape/weight significantly predicted treatment outcomes for BED patients participating in a controlled trial.

Collectively, the above findings suggest the importance of overvaluation in BED but do not address whether this body-image-related cognitive feature should be a required criterion. If BED patients who do not overvalue their shape/weight differ little from persons without eating disorders that would suggest the importance of this cognitive feature as a required criterion as is the case for BN. However, if overvaluation of shape/weight were required this might eliminate clinically meaningful cases of BED and broaden even further the troublesome eating disorder not otherwise specified (EDNOS) category (Fairburn & Bohn, 2005; Wilfley, Bishop, Wilson, & Agras, 2007). Alternatively, overvaluation of shape/weight could be used in some other fashion (e.g., as a dimensional severity rating or as a diagnostic specifier) to convey additional information about BED. For example, several mood disorder diagnoses include severity ratings and diagnostic specifiers to inform clinicians about important features (Brown & Barlow, 2005).

Two recent studies have produced data specifically relevant to whether overvaluation of shape/weight should receive consideration as a required criterion or as a dimensional severity rating or specifier. Mond, Hay, Rodgers, and Owen (2007), in a community-based sample assessed using the self-report Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1996), found that participants with BED with overvaluation had significantly higher levels of ED psychopathology and impairment than participants with BED without overvaluation. BED cases without overvaluation, however, differed little from obese individuals who did not report binge eating. Mond et al. (2007) concluded that overvaluation be considered as a required criterion for BED. Grilo and colleagues (2008), in a clinical sample of 210 overweight patients assessed using the interview version of the Eating Disorder Examination (EDE; Fairburn & Cooper, 1993), found that participants with BED with overvaluation had significantly greater ED psychopathology and depression levels than BED participants with subclinical overvaluation. Importantly, and in contrast to Mond et al. (2007)¹, both BED groups (regardless of degree of overvaluation) had significantly greater levels of ED psychopathology and depression than the overweight comparison group of those who did not binge eat. Grilo et al. (2008) also found that the group differences existed despite similar body mass index (BMI) across the three groups and even after controlling for group differences in depression levels. Grilo et al. (2008) noted that these findings, which provide further support for the validity of

¹The discrepancy between the two studies is likely, at least in part, due to Mond and colleagues' (2007) reliance on the EDE-Q (Fairburn & Beglin, 1996) to determine the BED diagnosis and to assess the degree of overvaluation. Studies consistently find that scale scores tapping cognitive features are significantly higher when the self-report EDE-Q is used versus the interview version of the EDE (Grilo, Masheb, & Wilson, 2001a, 2001b). Differences in recruitment and sampling (community versus clinical) may also account for some of the discrepancy.

the BED diagnosis (see Striegel-Moore & Franko, 2008), suggest the possible importance of shape/weight overvaluation as a diagnostic specifier. That is, in contrast R to Mond et al. (2007), Grilo et al. (2008) argued that overvaluation should not be a require would exclude a substantial proportion of individuals with clinic Cd criterion for BED, as this ally significant problems who differ from overweight patient controls.

The present study aims to more definitively address the significance of overvaluation of shape/weight for the diagnosis of BED by comparing BED patients shape/weight, BED patients with subclinical level of overvaluation, bulimia nervosa (BN) patients, and patients with sub-threshold BN (tec Dhnically diagnosed with EDNOS). The previous studies (Grilo et al., 2008; Mond et al., 2007) focused on BED groups compared to overweight comparison groups. The present analysis directly compares BED groups to BN patients since the BN diagnosis requires the presence of overvaluati. We also included sub-threshold BN as a fourth study group for several reasons. Sub-threshold BN is a common form of EDNOS, the most common ED diagnosis across clinical settins, yet the most poorly understood and (except for BED) neglected topic of study (Fairburn & Bohn, 2005). Subthreshold BN is of much interest to the *DSM-V* ED Work Group (Wilfley et al., 2007) as this form of “atypical” ED has demonstrated clinical significance and severity comparable to BN (Fairburn, Cooper, Bohn, O'Connor, Doll, & Palmer, 2007; Grilo et al., 2007). Thus, subthreshold BN represents an additional relevant treatment-seeking comparison group as context for evaluating the clinical significance of BED groups with and without overvaluation. Inclusion of this “homogenous” sub-threshold BN group (i.e., below BN thresholds for binge/purge frequency or for size of binge episodes) will also yield further data relevant to the important issue of whether such cases should be re-classified as BN in the *DSM-V* by broadening those individual *DSM-IV* diagnostic criteria which were never validated. Finally, we note that our design minimized potential confounds due to differences in treatment-seeking and various clinic biases (Fairburn, welch et al., 1996; Grilo, Lozano, & Masheb, 2005) because of the similar recruitment methods for BED and BN patients who were seeking treatment and responded to ads at specialty university research clinics. Thus, the present analysis of BED patient groups with and without overvaluation to patients with BN and subthreshold BN will address whether overvaluation of shape/weight should be considered as a required criterion for BED.

Method

Participants

Participants were 436 women evaluated for treatment studies at the department of psychiatry at Yale University and the Neuropsychiatric Research Institute at the University of North Dakota (NRI/UND). These advertisements specifically targeted patients with BED (Yale University) or BN (NRI/UND). Study inclusion criteria required meeting *DSM-IV* full research criteria for BED, full criteria for BN, or sub-threshold criteria for BN. Sub-threshold BN was defined as either full BN criteria except with binge eating/purging at a minimum of once weekly or full BN criteria except with “subjective” binge eating episodes (i.e., loss of control but not unusually large quantity of food). Exclusion criteria included pregnancy, current treatment for eating or weight problems, specific medical problems (diabetes, thyroid disease), or severe co-morbid psychological conditions (bipolar, psychosis, current drug dependence, suicidality). All participants provided written informed consent and study protocols were IRB approved.

Of the 436 participants, 324 met full research criteria for BED, 61 met full criteria for BN, and 51 were sub-threshold BN. The 324 BED participants are a consecutive series that included all of the 304 female BED participants from the Hrabosky et al. (2007) study. Overall, participants had a mean age of 40.2 years ($SD = 11.8$) and a mean BMI of 33.5 kg/m^2 ($SD = 8.9$). Most participants ($n = 370$, 84.9%) were White, while 40 (9.2%) were Black, 16 (3.7%) were Hispanic, 10 (2.3%) were of other or unspecified minority/ethnic groups. Consistent with

both the geographic locations of the two universities and the established differences in the distribution of BED and BN (Hudson et al., 2007), relative to the BN/EDNOS group the BED group had a significantly lower proportion of white participants (81.2% vs. 95.5%, Fisher's Exact Test $p < .001$) was significantly older ($M = 44.3$ ($SD = 9.4$) vs. $M = 28.5$ ($SD = 10.4$), $t(434) = 14.91$, $p < .001$), and had a significantly higher BMI ($M = 36.7$ ($SD = 7.4$) vs. $M = 24.0$ ($SD = 5.2$), $t(434) = 16.85$, $p < .001$).

Assessment and Measures

Assessments were administered by experienced research-clinicians who were trained in the administration of the study instruments. ED diagnoses were determined using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I/P; First, Spitzer, Gibbon, & Williams, 1996) and the EDE (Fairburn & Cooper, 1993). The EDE, a semi-structured investigator-based interview, was the primary method for assessing the specific features of EDs.

Eating Disorder Examination—The EDE focuses on the previous 28 days, except for diagnostic items that are rated for duration stipulations of the *DSM-IV*. The EDE assesses the frequency of different forms of overeating, including *objective bulimic episodes* (i.e., OBEs; eating unusually large quantities of food while experiencing a subjective sense of loss of control). The EDE's definition of OBEs corresponds to the *DSM-IV* criterion for binge eating for the BN and BED diagnoses. The EDE also assesses the frequency of different forms of inappropriate compensatory behaviors (e.g., vomiting, laxative misuse, etc) that define BN and are exclusions for BED. The EDE also comprises four subscales: Restraint, Eating Concern, Shape Concern, and Weight Concern. The items assessing ED features for the four scales are rated on a 7-point forced-choice format (0 to 6), with higher scores reflecting greater severity or frequency. The EDE, an established method for assessing EDs (Grilo et al., 2001), has good inter-rater and test-retest reliability with individuals with BED (Grilo, Masheb, Lozano-Blanco, & Barry, 2004) and BN (Rizvi, Peterson, Crow, & Agras, 2000).

Self-evaluation unduly influenced by shape and weight was measured using two specific items from the EDE: “Over the past four weeks, has your *shape* influenced how you feel about (judge, think, evaluate) yourself as a person?” and “Over the past 4 weeks has your *weight* influenced how you feel about (judge, think, evaluate) yourself as a person?” Given the complexity of these concepts, a second probe is used as a starting point for ensuring that participants understand these items (“If you imagine the things which influence how you feel about (judge, think, evaluate) yourself - such as your performance at work, being a parent, your marriage, how you get along with other people - and put these things in order of importance, where does your shape (or weight) fit in?”). The two overvaluation items are rated on a 7-point forced-choice scale anchored with 0 (No importance) to 6 (Supreme importance: nothing is more important in the subject's scheme for self-evaluation) in reference to each of the past three months. A composite *shape/weight overvaluation* value was created based on mean scores of these two items for the past four weeks consistent with prior studies with BED (Grilo et al., 2008) and BN (Goldfein, Walsh, & Midlarsky, 2000). Following Fairburn and Cooper's (1993) suggested clinical cut-off score of 4 (i.e., moderate importance), participants were categorized as experiencing either *clinical* or *subclinical overvaluation*. The *clinical overvaluation* group included individuals who reported that their shape and/or weight are high on the list of things that influence their self-evaluation (i.e., score ≥ 4 on either overvaluation item).

The *subclinical overvaluation group* included individuals who reported either no influence or, only a mild influence of shape/weight on their self-evaluation (i.e., score < 4 on both overvaluation items).

Results

Of the 324 participants with BED, 60% ($n = 195$) had clinical overvaluation and 40% ($n = 129$) with subclinical overvaluation. As expected, per the *DSM-IV* criteria determined using the SCID-I/P, the BED, BN, and sub-threshold BN groups differed significantly in the proportion of participants meeting overvaluation thresholds on the EDE ($D\chi^2(2, N=436) = 37.56, p < .001$). Clinical overvaluation was nearly universal in the BN patients: 95% (58 of 61) participants with BN and 86% (44 of 51) participants with sub-threshold BN had this feature.

Chi-square tests of independence performed on the four study groups on ethnicity (White versus non-White) reveal Eed significant differences ($\chi^2(df = 3, N = 324) = 16.79, p < .001$). While the majority of participants within all groups were White (84.9%), lower percentages of BED participants were White (76.7% of the clinical and 84.1% of the subclinical overvaluation groups) in comparison to the BN (96.7%) and sub-threshold BN (94.1%) groups. A general linear model (GLM) analysis of variance (ANOVA) revealed a significant difference among the four groups on age ($F(3, 432) = 74.21, p < .001, \eta^2 = 0.34$); participants within the BED clinical overvaluation ($M = 44.0, SD = 9.2$) and subclinical overvaluation ($M = 44.8, SD = 9.7$) groups did not differ from each other but were significantly older than BN ($M = 28.1, SD = 10.3$) and EDNOS ($M = 29.1, SD = 10.6$) groups, which did not differ from each other.

Table 1 summarizes descriptive statistics and findings from ANOVAs comparing the four groups on BMI and the study measures. Table 1 also shows partial η^2 , an effect size (ES) measure representing the proportion of variation in the criterion measure accounted for by group membership. Cutoff conventions for this ES measure are as follows: small (.01 - .09), medium (.10 - .24), and large (> .25). When ANOVAs revealed significant overall group differences, Scheffe post-hoc tests were performed to determine which specific groups differed².

The groups differed significantly, as expected, in BMI: the two BED groups, which did not differ significantly in BMI, had significantly higher BMI than the BN and sub-threshold BN groups, which did not differ significantly from each other. There were no significant within group correlations between BMI and overvaluation: 0.05 (for BED clinical overvaluation group), -0.06 (for BED subclinical overvaluation group), 0.02 (for BN group), and 0.11 (for EDNOS group). Restricting these correlational analyses to just white participants within each of the four study groups resulted in similar pattern of near-zero correlations between BMI and overvaluation.

The groups differed significantly in the frequency of OBEs. Scheffe post-hoc tests revealed that the sub-threshold BN group (per definition) had significantly fewer OBEs than the three other groups; in addition, the two BED groups did not differ significantly from one another but both had significantly fewer OBEs than the BN group. The groups differed significantly in levels of overvaluation and well as on the four EDE subscales; Scheffe post-hoc tests revealed a number of significant specific differences. In overvaluation levels, the BED subclinical overvaluation group differed significantly (i.e., had lower levels) from the three other groups (BED clinical overvaluation group, the BN group, and the subthreshold BN group) which did not differ significantly from each other. On the restraint scale, the two BED groups did not differ from each other but had significant lower scores than the BN and sub-threshold BN groups which did not differ from each other. For three EDE scales (eating concern, shape

²Tests for homogeneity of variance several instances of violated assumptions. ANOVAs were performed on log-transformed variables and revealed the same pattern of findings. Since the results did not change in any meaningful way, it is unlikely that the differences in variances impacted the pattern of results.

concern, and weight concern scales), the BED clinical overvaluation group had significantly higher scores than the three other groups which did not differ significantly from each other.

Since the BED groups had a significantly greater proportion of minority participants than the other groups, we repeated the ANOVAs using data from White participants only. Table 1 shows the partial η^2 values for these ANOVAs; these effect sizes are similar to those for the overall study group. Since the groups differed significantly in age and in BMI, we performed two sets of ANCOVAs (one set controlling for age and one controlling for BMI). As summarized in Table 1, controlling for age and BMI, respectively, altered the overall findings little.

Discussion

This study examined the significance of overvaluation of shape/weight for the diagnosis of BED by comparing BED patients who overvalue their shape/weight, BED patients with subclinical levels of overvaluation, BN patients, and sub-threshold BN patients. Whereas clinical overvaluation is nearly universal in patients with BN and even among those with sub-threshold BN, only 60% of BED patients met research convention criteria for clinical overvaluation. When overvaluation of shape/weight was considered dimensionally, the BED subclinical overvaluation group had significantly lower levels than the BED clinical overvaluation group, the BN group, and the subthreshold BN groups which did not differ significantly from each other.

Our findings here extend those previously reported based on comparisons to overweight patients (Grilo et al., 2008) as the comparisons to two BN study groups revealed important further evidence that the overvaluation of shape/weight provides important information about severity within BED. Findings suggest that overvaluation of shape/weight warrants consideration as a diagnostic specifier or as a dimensional severity rating. The BED clinical overvaluation group had significantly higher eating concern, shape concern, and weight concern scores than the three other groups (BED subclinical overvaluation, BN, and subthreshold BN) which did not differ significantly from each other. Importantly, BED patients with subclinical overvaluation did not differ significantly from patients with BN or with sub-threshold BN. Thus, while overvaluation provides critical information about severity within BED, if it were a required criterion a substantial proportion of patients with clinically significant problems would be excluded and result in more EDNOS diagnoses. We emphasize that these patterns are not attributable to significant BMI differences between BED and BN groups because within each of the four study groups, overvaluation levels and BMI were not associated (near zero correlations). We also note that reliance on similar recruitment methods (i.e., recruitment of treatment-seeking BED and BN patients by specialty university-based research clinics) reduces the potential for confounds *within* this comparative study due to clinic biases (e.g., Fairburn, Welch, et al., 1996; Grilo, Lozano, et al., 2005).

Overvaluation has diagnostic and clinical relevance. Advantages of adding dimensional severity rating to the categorical *DSM* system have been recently emphasized (Brown & Barlow, 2005; Wilfley et al. 2007) and are used, for example, with mood disorders (Brown & Barlow, 2005). The degree of overvaluation would convey important individual differences not just in the disorder severity but in a clinically significant cognitive feature. This cognitive feature would also guide clinicians in planning clinical interventions (e.g., cognitive restructuring methods; see Wilson, Grilo, & Vitousek (2007)) targeting shape/weight overvaluation. Findings that pretreatment levels of overvaluation of shape/weight significantly predicted treatment outcomes (Masheb & Grilo, 2008) support this concept.

Our findings provide further support for the distinctiveness of BED from BN (beyond their different defining features). Our findings regarding the sub-threshold BN group also have

relevance for *DSM-V*. Patients with sub-threshold BN and BN did not differ significantly on any variables other than frequency and types of the binge eating. Thus, patients who binge/purge weekly or who “binge” but not on unusually large amounts of food (i.e., subjective bulimic episodes) do not differ from full threshold BN patient on other ED psychopathology. This finding raises questions about the validity of the size criterion for binge episodes and the twice-weekly frequency criterion for binge/purge behaviors as currently required by the *DSM-IV* (Wilfley et al., 2007).

Strengths of this study include use of clinically-meaningful comparison groups and rigorous interviews to establish diagnoses and to assess complex ED psychopathology. Although the BED and BN groups were recruited using separate advertisements at two medical schools, they were similarly recruited for treatment studies. Although the BED and BN groups differed significantly in terms of age (BED older), ethnicity (BED more diverse), and BMI (BED heavier), these features are well-established differences associated with the disorders epidemiologically (Hudson et al., 2007). Moreover, analyses restricted to only white participants did not alter findings, controlling for age and BMI altered the findings very little, and BMI and overvaluation levels were not associated within any of the four study groups. Several potential limitations are noteworthy. Participants were respondents to ads for studies at medical schools and the findings may not generalize to other clinic settings (Fairburn, Welch et al., 1996), non-treatment-seekers (Grilo, Lozano et al., 2005), or to those unwilling to participate in research. Our findings may not generalize to persons who suffer from co-morbid medical problems, such as diabetes, who might have different priorities regarding health and appearance. Lastly, the cross-sectional analysis precludes any statements regarding the prognostic significance of this construct in BED; future research should examine this issue in naturalistic longitudinal studies and as a predictor/moderator of outcome in treatment studies (e.g., Masheb & Grilo, 2008). With this context in mind, to summarize, our findings suggest that inclusion of overvaluation of shape/weight as a required criterion for BED may exclude individuals with a clinically significant ED. However, it may serve a clinically useful function as a diagnostic modifier.

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References

- American Psychiatric Association. Diagnostic and statistical manual of mental disorders. Vol. 4th ed.. Author; Washington, DC: 1994.
- Brown TA, Barlow DH. Dimensional versus categorical classification of mental disorders in the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders and beyond: comment on special series. *Journal of Abnormal Psychology* 2005;114:551–556. [PubMed: 16351377]
- Fairburn CG, Beglin SJ. Assessment of eating disorders: interview or self-report questionnaire? *International Journal of Eating Disorders* 1994;16:363–370. [PubMed: 7866415]
- Fairburn CG, Bohn K. Eating disorder NOS (EDNOS): an example of the troublesome “not otherwise specified” (NOS) category in DSM-IV. *Behaviour Research and Therapy* 2005;43:691–701. [PubMed: 15890163]
- Fairburn, CG.; Cooper, Z. The Eating Disorder Examination. In: Fairburn, CG.; Wilson, GT., editors. *Binge eating: Nature, assessment, and treatment*. Vol. 12th ed.. Guilford Press; New York: 1993. p. 317–360.
- Fairburn CG, Coper Z, Bohn K, O'Connor ME, Doll HA, Palmer RL. The severity and status of eating disorder NOS: implications for DSM-V. *Behaviour Research and Therapy* 2007;45:1705–1715. [PubMed: 17374360]

- Fairburn CG, Welch SL, Norman PA, O'Connor ME, Doll HA. Bias and bulimia nervosa: how typical or clinic cases? *American Journal of Psychiatry* 1996;153:386–391. [PubMed: 8610827]
- First, MB.; Spitzer, RL.; Gibbon, M.; Williams, JBW. Structured Clinical Interview for DSM-IV Axis I Disorders Patient-Version (SCID-I/P). NYSPI; New York: 1996.
- Goldfein JA, Walsh BT, Midlarsky E. Influence of shape and weight on self-evaluation in bulimia nervosa. *International Journal of Eating Disorders* 2000;27:435–445. [PubMed: 10744850]
- Grilo CM, Hrabosky JI, Allison KC, Stunkard AJ, Masheb RM. Overvaluation of shape and weight in binge eating disorder and overweight controls: refinement of a diagnostic construct. *Journal of Abnormal Psychology* 2008;117:414–419. [PubMed: 18489217]
- Grilo CM, Lozano C, Masheb RM. Ethnicity and sampling bias in binge eating disorder. *International Journal of Eating Disorders* 2005;38:257–262. [PubMed: 16211631]
- Grilo CM, Masheb RM, Lozano-Blanco C, Barry DT. Reliability of the Eating Disorder Examination in patients with binge eating disorder. *International Journal of Eating Disorders* 2004;35:80–85. [PubMed: 14705160]
- Grilo CM, Masheb RM, Wilson GT. A comparison of different methods for assessing the features of eating disorders in patients with binge eating disorder. *Journal of Consulting and Clinical Psychology* 2001a;69:317–322. [PubMed: 11393608]
- Grilo CM, Masheb RM, Wilson GT. Different methods for assessing the features of eating disorders in patients with binge eating disorder: a replication. *Obesity Research* 2001b;9:418–422. [PubMed: 11445665]
- Grilo CM, Pagano ME, Skodol AE, Sanislow CA, McGlashan TH, Gunderson JG, Stout RL. *Journal of Clinical Psychiatry* 2007;68:738–746. [PubMed: 17503983]
- Hrabosky JI, Masheb RM, White MA, Grilo CM. Overvaluation of shape and weight in BED. *Journal of Consulting and Clinical Psychology* 2007;75:175–180. [PubMed: 17295577]
- Hudson JI, Hiripi E, Pope HG, Kessler RC. The prevalence and correlates of eating disorders in the NCS Replication. *Biological Psychiatry* 2007;61:348–358. [PubMed: 16815322]
- Masheb RM, Grilo CM. Binge eating disorder: A need for additional diagnostic criteria. *Comprehensive Psychiatry* 2000;41:159–162. [PubMed: 10834622]
- Masheb RM, Grilo CM. Prognostic significance of two sub-categorization methods for binge eating disorder: negative affect and overvaluation predict, but do not moderate, specific outcomes. *Behaviour Research and Therapy* 2008;46:428–437. [PubMed: 18328464]
- Mond JM, Hay PJ, Rodgers B, Owen C. Recurrent binge eating with and without the “undue influence of weight or shape on self-evaluation”: Implications for the diagnosis of binge eating disorder. *Behaviour Research and Therapy* 2007;45:929–938. [PubMed: 17010307]
- Rizvi SL, Peterson CB, Crow SJ, Agras WS. Test-retest reliability of the eating disorder examination. *International Journal of Eating Disorders* 2000;28:311–316. [PubMed: 10942917]
- Striegel-Moore R, Franko D. Should binge eating disorder be included in the DSM-V? Critical review of state of the evidence. *Annual Review Clinical Psychology* 2008;4:305–324.
- Wilfley DE, Bishop ME, Wilson GT, Agras WS. Classification of eating disorders: toward DSM-V. *International Journal of Eating Disorders* 2007;40:S123–S129. [PubMed: 17685383]
- Wilfley DE, Schwartz MB, Spurrell EB, Fairburn CG. Using the Eating Disorder Examination to identify the specific psychopathology of binge eating disorder. *International Journal of Eating Disorders* 2000;27:259–269. [PubMed: 10694711]
- Wilson GT, Grilo CM, Vitousek K. Psychological treatments for eating disorders. *American Psychologist* 2007;62:199–216. [PubMed: 17469898]

Comparison of BED Clinical Overvaluation (n=195), BED Subclinical Overvaluation (n=129), BN (n=61), and BN Subthreshold (n=51) Groups on Study Measures

Table 1

	BED Clinical Overvaluation		BED Subclinical Overvaluation		BN		BN sub-threshold		F^1	Partial η^2	Partial η^2 Whites ³	Partial η^2 Age ⁴	Partial η^2 BMI ⁵
	M	SD	M	SD	M	SD	M	SD					
Body Mass Index	36.65 _a	7.51 _a	36.87 _a	7.32	23.47 _b	5.28	24.56 _b	4.98	94.62*	.40	.40	.26	–
Eating Disorder Examination													
Shape Concern ⁶	4.56 _a	1.06	3.78 _b	1.01	3.37 _b	1.58	3.37 _b	1.39	27.15*	.16	.16	.13	.12
Weight Concern ⁶	3.65 _a	.97	2.88 _b	.90	3.03 _b	1.49	3.39 _b	1.43	14.21*	.09	.09	.10	.09
Restraint	2.15 _a	1.39	1.73 _a	1.24	3.58 _b	1.20	3.23 _b	1.38	36.11*	.20	.21	.10	.08
Eating Concern	2.64 _a	1.34	1.75 _b	1.09	1.87 _b	1.26	1.73 _b	1.37	10.66*	.07	.06	.07	.06
Shape/Weight Overvaluation	4.75 _a	.94	1.84 _b	.95	4.59 _a	1.01	4.51 _a	1.21	251.46*	.64	.62	.62	.63
Weekly Binge Eating ⁷	4.28 _a	2.56	4.05 _a	2.59	7.84 _b	6.68	1.29 _c	2.35	35.01*	.20	.20	.19	.19

Note. BED = binge eating disorder; BN = bulimia nervosa.

Row means that do not share subscripts differ significantly at $p < .05$ or less using Scheffe post hoc comparisons .

¹ $df(3, n = 436)$ with $*p < .001$.

² Effect sizes from analysis of variance (ANOVAs) for all participants ($n = 436$).

³ Effect sizes from analysis of variance (ANOVAs) when limited to ($n = 370$) white participants only ($df(3, n = 370)$).

⁴ Effect sizes from analysis of covariance (ANCOVAs), controlling for age. Significant overall group differences were found for all seven variables, although the partial η^2 values for two variables (body mass index and restraint) were reduced relative to the partial η^2 values for the ANOVAs. Bonferroni correction on the age-adjusted contrasts revealed a similar pattern to the Scheffe post-hoc (ANOVA) comparisons, except that: (1) BED clinical overvaluation and BN sub-threshold groups no longer differed significantly on weight concern scores; (2) on restraint, only the BED clinical and BED subclinical contrasts remained significant; and (3) on eating concerns, only the BED clinical and BED subclinical contrasts remained significant.

⁵ Effect sizes from ANCOVAs, controlling for body mass index (BMI). Significant overall group differences were found for all six variables, although the partial η^2 values for two variables (body mass index and restraint) were reduced relative to the partial η^2 values for the ANOVAs. Bonferroni correction on the age-adjusted contrasts revealed a similar pattern to the Scheffe post-hoc (ANOVA) comparisons, except that: (1) BED clinical overvaluation and BN sub-threshold groups no longer differed significantly on weight concern scores; (2) on restraint, the BED clinical overvaluation group had higher scores than BED subclinical overvaluation group and the BN and BN sub-threshold groups are no longer significant.

⁶ The EDE Shape Concern and Weight Concern scale scores were calculated without their respective overvaluation items included in the interview's standard scoring methods. If the overvaluation items were included, the means and standard deviations of these scales would be as follows: 4.41 $\pm$ 1.06 (Shape Concern) and 3.86 $\pm$.85 (Weight Concern) for the BED clinical overvaluation group, 3.23 $\pm$ 1.01 (Shape Concern) and 2.67 $\pm$.78 (Weight Concern) for the BED subclinical overvaluation group, 3.55 $\pm$ 1.40 (Shape Concern) and 3.52 $\pm$ 1.26 (Weight Concern) for the BN group, and 3.53 $\pm$ 1.27 (Shape Concern) and 3.39 $\pm$ 1.08 (Weight Concern) for the BN sub-threshold group

⁷ Weekly binge eating is defined by the average weekly frequency of objective bulimic episodes during the previous month.