

Shorter communication

Loss of control over eating reflects eating disturbances and general psychopathology

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Received 23 July 2006; received in revised form 2 December 2006; accepted 6 December 2006

Abstract

This study examined the clinical significance of the loss of control over eating as a key component of eating disorders. It investigated the association of eating-related psychopathology and general psychopathology with objective bulimic episodes (OBEs; experiencing a loss of control while consuming large amounts of food) and subjective bulimic episodes (SBEs; experiencing a loss of control while consuming small/moderate amounts). A community sample of 81 women with a range of disordered eating was recruited: binge-eating disorder, bulimia nervosa, subclinical eating disturbances, or no eating disorders. They were interviewed using the Eating Disorder Examination and completed measures of eating-related and general psychopathology. Both OBE and SBE frequencies correlated significantly with measures of eating-related and general psychopathology, and no significant differences were found between the magnitudes of the correlations with either binge episode type. SBE frequency significantly and independently predicted global eating disorder psychopathology. The loss of control over eating, without consuming large amounts of food, was as closely associated with specific eating disorder psychopathology and general mental health as were traditionally defined OBEs. SBEs may be an important target of treatment and should be considered for future diagnostic classifications of eating disorders.

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Keywords: Eating disorders; Binge eating disorder; Bulimia nervosa; Loss of control; Subjective bulimic episodes; Depression and anxiety

Introduction

Binge eating is the central diagnostic criterion for bulimia nervosa (BN) and binge eating disorder (BED). The Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV), defines binge eating episodes as the consumption of an objectively large amount of food in a discrete timeframe, while experiencing a loss of control over eating (American Psychiatric Association, 1994). These episodes have also been termed objective bulimic episodes (OBEs; Fairburn & Cooper, 1993). OBEs have been distinguished from subjective

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bulimic episodes (SBEs), which are defined as the experience of a loss of control over eating while consuming only small or moderate amounts of food.

SBEs may be an important component of eating disorder psychopathology. First, in contrast to the DSM definition of binge eating, patients' and lay persons' concepts of binge eating may not be based on episode size. Patient-defined episodes may often include episodes where small amounts of food are eaten (Johnson, Robertson-Nay, Rohan, & Torgrud, 2003). Patients' judgments of whether or not they have binged are based primarily on whether they have experienced a loss of control over eating (as opposed to the amount eaten), an experience common to both OBEs and SBEs (Telch, Pratt, & Niego, 1998). Second, limited evidence suggests that relative to OBEs, SBEs may be equally or more closely associated with core features of eating disorder psychopathology, such as dietary restraint (Kerzhnerman & Lowe, 2002). Third, SBEs are also as closely associated as are OBEs with certain aspects of general psychopathology and eating psychopathology (Keel, Mayer, & Harnden-Fischer, 2001; Picot & Lilienfeld, 2003; Pratt, Niego, & Agras, 1998). In children, the experience of loss of control over eating, regardless of the size of the eating episodes, is associated with heavier weight, greater body dissatisfaction, anxiety, and depression (Morgan et al., 2002).

Despite the frequent occurrence of SBEs among individuals with BN and BED and despite their possible relationship with core ED psychopathology (Keel et al., 2001; Picot & Lilienfeld, 2003), SBEs are not part of the DSM diagnostic classification of any eating disorder. However, SBEs may be significant in two contexts. First, SBEs may be significant among individuals BN and BED who, by definition, also have OBEs. Second, they may be significant among individuals with a specific type of EDNOS that resembles BN: specifically, those who have extreme weight control behaviors in the absence of OBEs. This subgroup has been referred to as "purging disorder" (Keel, Haedt, & Elder, 2005), or "compensatory eating disorder" (Tobin, Griffing, & Griffing, 1997).

In addition, SBEs are not normally included as primary outcome measures in treatment studies, and, with rare exceptions (Loeb, Wilson, Gilbert, & Labouvie, 2000; Peterson et al., 2000), are typically not even reported in these studies. Yet they are an important symptom that does not appear to easily remit. SBEs may be slower than OBEs to respond to treatment in BED patients (Niego, Pratt, Agras, 1997) and they persist following treatment termination among BN patients (Walsh, Fairburn, Mickley, Sysko, & Parides, 2004). SBEs also do not respond well to the basic treatment strategy of self-monitoring in women with either BN or BED (Hildebrandt & Latner, 2006), even though this strategy is effective in reducing OBEs (Latner & Wilson, 2002). It is possible that the persistence of SBEs following treatment is a marker of continued dietary restraint, which has been linked with SBEs (Kerzhnerman & Lowe, 2002). Persistent dietary restraint is a negative prognostic indicator that predicts relapse following treatment for both BN (Halmi et al., 2002) and BED (Safer, Lively, Telch, & Agras, 2002), and the reduction in dietary restraint has been found to mediate treatment outcome in BN (Wilson, Fairburn, Agras, Walsh, & Kraemer, 2002).

Empirical research is needed to identify those aspects of eating disorder psychopathology and general psychopathology that are associated with SBEs. The present study was designed to test the hypothesis that SBEs are closely associated with both eating-related and general psychopathology in community women with a range of eating disorders including BED, BN, subclinical eating disorders, and no eating disorders. It utilized a range of measures of eating disturbances and general psychopathology, and an interview-based assessment of eating disorders and binge eating. We predicted that the association between SBEs and both forms of psychopathology would be strong, and comparable to the association between OBEs and these forms of psychopathology.

Methods

Participants

Community and campus advertisements were posted announcing that researchers were seeking women to participate in a study on eating patterns. One set of advertisements sought healthy women, and another sought women with regular binge eating. Women who responded to advertisements and did not meet exclusion criteria during telephone screening (approximately 90 women; exclusion criteria were serious substance abuse, chronic medical conditions known to influence appetite, severe psychiatric problems, and pregnancy or

lactation) were invited to participate. Eighty-one women arrived at their scheduled appointment and consented to participate. They had a range of eating disorders/disturbances, including BED ($n = 18$), BN ($n = 7$), subclinical variants of these disorders ($n = 35$), or no eating disorders ($n = 21$). Participants had a mean age of 28.11 years ($SD = 10.62$) and a mean BMI (kg/m^2) of 27.69 ($SD = 6.49$). Eighty-one percent of participants were New Zealand European or other Caucasian, 10% were Asian or part Asian, 7% were New Zealand Maori or part Maori, and 2% were Pacific Islander or part Pacific Islander.

Group assignment

Following a brief telephone screen, participants were interviewed and diagnosed by trained interviewers using the Eating Disorder Examination (EDE; Fairburn & Cooper, 1993), a diagnostic interview of eating disorders and related psychopathology. The EDE was used to diagnose participants who met criteria for either BN or BED. In addition to assessing diagnostic criteria for eating disorders, the EDE assesses core eating disorder psychopathology in four domains (subscales): restraint, shape concerns, weight concerns, and eating concerns. The EDE has demonstrated good reliability (Rizvi, Peterson, Crow, & Agras, 2000) and concurrent validity (Rosen, Vara, Wendt, & Leitenberg, 1990). The EDE is widely considered one of the most valid assessment measures of bulimic episodes. For each of two assessors administering the EDE, the first 10 interviews conducted for the study were co-rated and co-diagnosed by at least 2 raters, with 100% interrater agreement for diagnoses and OBE and SBE assessment. In the current sample, the internal consistency (Cronbach's alpha) of the subscales and global measure (all subscale items combined) was 0.83 for restraint, 0.83 for eating concern, 0.80 for weight concern, 0.89 for shape concern, and 0.94 for the global scale.

BED and BN were diagnosed according to strict DSM-IV criteria for these disorders (American Psychiatric Association, 1994), requiring binge episodes on 2 days per week, on average, for the past 6 months for BED, and binge eating and compensatory episodes (including nonpurging) twice per week, on average, for the past 3 months for BN. Participants with no eating disorder did not meet criteria for any DSM-IV eating disorder, including anorexia nervosa, had no OBEs and no more than one SBE in the past 28 days, no episodes of compensatory behavior in the past 28 days, and had no history of an eating disorder. This category also required that participants score no higher than 20 on the Eating Attitudes Test, a 26-item screening measure that detects for general eating disturbance (Garner, Olmstead, Bohr, & Garfinkel, 1982). Participants who fell between the categories of BED or BN and having no eating disorder were considered to have subclinical variants of eating disorders. (For example, a participant who reported 2 OBEs and 3 SBEs and one episode of self-induced vomiting in the past 28 days would be placed into the subclinical variant category.) Participants in this subclinical category had a mean (SD) frequency of 3.53 (5.34) days containing OBEs, 4.82 (8.90) days with SBEs, 0.69 (3.54) with self-induced vomiting, 0.31 (1.23) with laxative abuse, and 0.06 (0.35) with diuretic abuse in the past 28 days.

Self-report measures of eating disorder and general psychopathology

The Three-Factor Eating Questionnaire (TFEQ; Stunkard & Messick, 1985) is a 51-item measure of cognitive restraint, disinhibition, and hunger. These subscales have been shown to have good reliability and validity (Stunkard & Messick, 1985). Cronbach's alphas for the subscales in the current sample were 0.91 for cognitive restraint, 0.81 for disinhibition, and 0.79 for hunger. Participants were also asked to report the frequency of their past weight fluctuation ("How many times have you lost and gained back 9 kg or more?"), and responses included *never*, *once or twice*, *three or four times*, and *five times or more times*.

The Eating Disorders Inventory (EDI; Garner, Olmstead, & Polivy, 1983) consists of 64 questions comprising 8 subscales assessing aspects of eating disorder psychopathology (drive for thinness, bulimia, and body dissatisfaction) and related problems thought to be relevant to eating disorders (ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness, and maturity fears). Responses are made on a 6-point scale ranging from *always* to *never*. The subscales have good internal consistency, convergent validity, and discriminant validity (Garner et al., 1983). Responses were scored based on the untransformed (1–6) scoring system, as this may heighten the sensitivity of the scale and improve its factorial integrity, particularly in nonclinical samples (Schoemaker, van Strien, & van der Staak, 1994). Cronbach's alphas of the subscales in

the current sample were as follows: drive for thinness (0.90), bulimia (0.88), body dissatisfaction (0.94), ineffectiveness (0.94), perfectionism (0.76), interpersonal distrust (0.86), interoceptive awareness (0.85), and maturity fears (0.84).

The Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995) is a 42-item measure of symptoms of depression, anxiety, and perceived stress. It uses a Likert scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). The measure is highly correlated with the Beck Depression Inventory (Lovibond & Lovibond, 1995). The DASS subscales, depression, anxiety and perceived stress, have good test–retest reliability (Brown, Chorpita, Korotitsch, & Barlow, 1997; Crawford & Henry, 2003). Cronbach's alphas in the current sample were: depression (0.92), anxiety (0.92), stress (0.92), and total scale (0.97).

These procedures were approved by the Human Ethics Committee at the University of Canterbury, and all participants gave informed consent.

Statistical analysis

Two measures of binge episode frequency (OBEs and SBEs) were available: the number of binge episodes in the past 28 days, and the number of days in the past 28 in which binge episodes occurred. The number of days in which episodes occurred was used in all analyses.¹ In the total sample, Pearson product–moment correlations were run to examine the association between SBEs and OBEs and other variables. In order to assess whether significant differences occurred between the magnitudes of the correlations of each variable with SBEs and with OBEs, Z-tests were conducted according to the procedure for comparing correlations described by Meng, Rosenthal, and Rubin (1992). This procedure takes into account the relationship between the two variables (i.e., OBEs and SBEs) whose correlations with another variable (i.e., measures of psychopathology) are being compared. An alpha level of 0.01 was determined as the level of significance, in order to reduce the risk of Type-I error. Finally, regression models were used to examine the independent associations between OBEs, SBEs, and measures of eating disorder psychopathology and general psychopathology, while also controlling for BMI, age, frequency of self-induced vomiting, laxative abuse, and diuretic abuse by including them as potential predictors in the analyses.

Results

Correlations with OBEs and SBEs

OBE and SBE frequency were not significantly correlated with each other, though the association approached significance ($r(80) = .22, p = .052$). However, frequencies of both binge types were significantly correlated with the severity of other diagnostic features of eating disorders: self-induced vomiting to control shape and weight, diuretic misuse to control shape and weight, episodes and number of minutes spent on over-exercising to control shape and weight, and excessive importance placed on shape and weight, and long periods of food avoidance (Table 1). Both binge types were also significantly correlated with numerous subscales of the DASS, the EDE, and EDI, as shown in Table 1.

Z-tests comparing the correlation coefficients for each variable (Meng et al., 1992) demonstrated no significant differences between the magnitude of the correlations of SBEs with measures of psychopathology and the magnitude of the correlations of OBEs with measures of psychopathology.

Regression analyses

The first regression analysis significantly predicted global eating disorder psychopathology as measured by the total score on the EDE ($F(7, 68) = 10.65, p < 0.001$). Together, 52% of the variance in eating disorder psychopathology was accounted for in this analysis. The individual beta weights of OBEs and SBEs were each significant (OBE: $\beta = 0.45, t = 4.56, p < 0.001$; SBE: $\beta = 0.28, t = 2.97, p < 0.005$), as was frequency of

¹Analyses were run using both measures of binges, and results were not altered by the use of episodes versus days.

Table 1

Correlations (*r* values) between eating-related disturbances, eating and general psychopathology, and the frequency of objective and subjective bulimic episodes, and Z-tests of the differences between the magnitudes of each pair of correlations

		OBE frequency	SBE frequency	Z-score
Eating-related disturbances	Self-induced vomiting	0.42*	0.40*	0.13
	Laxative misuse	0.22	0.05	1.17
	Diuretic misuse	0.21*	0.51*	−1.99
	Excessive exercise frequency	0.23*	0.21*	0.14
	Excessive exercise duration	0.32*	0.33*	−0.07
	Importance of shape	0.36*	0.30*	0.40
	Importance of weight	0.44*	0.31*	0.86
	Food avoidance	0.42*	0.35*	0.47
	Weight fluctuation	0.28*	0.18	0.69
Eating disorder inventory	Drive for thinness	0.46*	0.44*	0.13
	Introspective awareness	0.49*	0.30	1.27
	Bulimia	0.69*	0.32*	2.39
	Body dissatisfaction	0.33*	0.27	0.41
	Ineffectiveness	0.46*	0.28	1.21
	Maturity fears	0.15	0.30*	−1.04
	Perfectionism	0.15	0.08	0.49
	Interpersonal distrust	0.24	0.18	0.42
Three-factor eating questionnaire	Restraint	0.12	0.28	−1.11
	Disinhibition	0.53*	0.26	1.80
	Hunger	0.48*	0.23	1.68
Depression anxiety and stress scale	Depression	0.44*	0.33*	0.74
	Anxiety	0.46*	0.36*	0.67
	Stress	0.53*	0.38*	0.99
Eating disorders examination	Restraint	0.47*	0.41*	0.40
	Eating concern	0.51*	0.44*	0.46
	Weight concern	0.50*	0.39*	0.71
	Shape concern	0.53*	0.40*	0.84
Eating attitudes test	Total	0.43*	0.46*	−0.20

Note. * $p < 0.01$.

Self-induced vomiting, laxative misuse, diuretic misuse, excessive exercise frequency, excessive exercise duration (minutes per episode), avoidance of food = number of days over the past 28 days on which these behaviors occurred. Weight fluctuation = past frequency of having lost and regained at least 9 kg of body weight.

self-induced vomiting ($\beta = 0.28$, $t = 2.31$, $p < 0.05$). BMI, age, laxative abuse and diuretic abuse were not independently significant.

Similar results were found for global general psychopathology as measured by the total score on the DASS. The regression accounted for 39% of the variance in DASS scores ($F(7, 68) = 6.33$, $p < 0.001$). Frequency of OBEs ($\beta = 0.32$, $t = 2.90$, $p < 0.005$) and self-induced vomiting ($\beta = 0.28$, $t = 2.00$, $p < 0.05$) were independently significant. However, SBE frequency was not independently significant ($\beta = 0.14$, *n.s.*), and neither was BMI, age, laxative abuse or diuretic abuse.

Discussion

The present findings demonstrate that objective and SBEs may be similarly related to psychopathology. Both OBEs and SBEs are associated with multiple facets of eating disorder-related symptoms and with core elements of general psychopathology, including depression, anxiety, and stress. The strength of the associations of these variables with each of the two binge types was not significantly different. This was the case despite the nonsignificant association between OBEs and SBEs, indicating a relatively low degree of

overlap between the two types of bulimic episodes. Further indication that OBEs and SBEs are each associated with psychopathology was demonstrated in regression analyses showing that both episode types significantly and independently predicted global eating disorder psychopathology. These results suggest that SBEs are as strong an indicator as OBEs of core eating disorder symptoms and that this association is independent of the relationship between SBEs and OBEs. On the other hand, mood-related psychopathology was uniquely predicted by OBEs, as well as by self-induced vomiting. The strengths of this study included recruitment from the community, inclusion of a range of measures of eating disturbances and general psychopathology, a sample with a range of eating disturbances, and the interview-based assessment of OBEs and SBEs.

The correlations between OBEs and TFEQ disinhibition and hunger and those between SBEs and TFEQ disinhibition and hunger were not significantly different from each other. However, that the correlations of OBEs with these TFEQ subscales were significant, while those of SBEs were not, is reminiscent of previous findings that TFEQ disinhibition and hunger subscales were elevated in BN compared with purging disorder (Keel et al., 2005). In the present study, both binge types were significantly and similarly correlated with EDE restraint. The relationship between SBEs and dietary restraint, a term that has been the focus of much recent theoretical revision (Stice, Fisher, & Lowe, 2004), indicates that the belief that one should be restricting food intake is associated with the feeling of being out of control while eating small amounts of food. As Stice et al. (2004) have suggested, rigid dietary restraint may be closely linked with maladaptive cognitions associated with dieting. Maladaptive cognitions about dieting (e.g., “having one chocolate bar will make me obese”) may be behind the experience of SBEs, where eating small amounts of forbidden food trigger the experience of a loss of control. The significant relationship of SBEs with maturity fears may also be indicative of a more general difficulty dealing with typical developmental experiences, or a “restrictive schema.” It is possible that participants who believe they should be restrictive in their eating may also be restricted in their willingness or desire to accept increased responsibility in multiple life domains.

In view of the high prevalence and increasing recognition of eating disorders not otherwise specified (EDNOS; Fairburn & Bohn, 2005; Turner & Bryant-Waugh, 2004), determining the key characteristics of common forms of these disorders has become essential. Defining the symptoms that constitute EDNOS is now especially relevant as a literature is assembled to inform the fifth edition of the DSM (DSM-V). As evidence accumulates for the clinical significance of SBEs, it seems clear that this form of disordered eating deserves further clinical and research attention. Recent evidence by Mond et al. (2006) supports the diagnostic utility of SBEs. Self-reported SBEs in a sample of community women were associated with elevated levels of functional impairment and eating disorder pathology, particularly in combination with compensatory behavior such as self-induced vomiting and laxative abuse. Similarly, women with purging disorder display greater psychopathology than control women and similar psychopathology to women with BN on several measures of eating and general psychopathology (Keel et al., 2005).

The relationship between SBEs and dietary restraint also has implications for treatment. To our knowledge, no treatment strategy for eating disorders targets SBEs specifically. Given the slow response of SBEs to cognitive behavior therapy (CBT; Niego et al., 1997), additional treatment strategies targeting their occurrence may improve outcomes for patients. For example, increased therapeutic focus on the maladaptive cognitions associated with dietary restraint (e.g., “dieting is the only effective way to maintain my weight”) and on behavioral indicators of restraint could enhance the response of SBEs to CBT for eating disorders. Furthermore, specific attention to SBEs will be necessary for the application of empirically supported treatments to patients falling within the EDNOS diagnostic category, particularly those who do not display regular OBEs (e.g., purging disorder; Keel et al., 2005).

One limitation of the current study is its cross-sectional design, and prospective research is needed to address the predictive validity of eating disorders characterized by SBEs and extreme weight control behaviors. Longitudinal research can also help to determine the potential role of SBEs in predicting the worsening of symptoms over time, crossover between eating disorders, and recovery from eating disorders. This study assessed a community sample of participants with a range of severity of eating disturbances, and participants ranged from having no eating disturbances to having full-syndrome eating disorders. However, as the number of participants with BN was limited, further research should investigate the relative importance of SBEs among women with BN. Another limitation is the reliance on single-item measures, such as in the assessment of binge episode types, compensatory behaviors, and importance of shape and weight.

An additional concern is the reliability of assessing SBEs. Several studies have found that SBEs as assessed by the EDE have poor test–retest reliability (Grilo, Lozano, & Elder, 2005; Grilo, Masheb, Lozano-Blanco, & Barry, 2004). However, the assessment of test–retest reliability of SBEs is problematic; differences in SBEs over time may reflect actual fluctuations in the behavior over time, such as “binge drift,” the increase in SBEs (and decrease in OBEs) during periods of self-monitoring (Hildebrandt & Latner, 2006). In addition, the EDE has shown good interrater reliability in distinguishing BN (involving regular OBEs) from purging disorder (involving only SBEs; Keel et al., 2005). While there may be room for improvement in the assessment of SBEs, the consensus of studies suggest a relationship between SBEs and eating disorder symptoms. This is difficult to reconcile with the poor reliability of their assessment, but this consistency of findings suggests that SBEs may be a reliable marker of psychopathology. Future research should consider developing new and improved methods of measuring SBEs.

The present study examined only the psychological correlates of the two types of bulimic episodes. Possible physiological correlates of binge eating, such as the satiety-related disturbances present in BN (in cholecystokinin [CCK; Devlin et al., 1997], ghrelin, peptide YY [Monteleone et al., 2005], and gastric distention (Geliebter et al., 1992), were not examined here. It is possible that OBEs and SBEs have different associations with the physiological dysfunction in BN or BED. Physiological mechanisms, such as CCK and serotonin function, may differentiate between individuals with and without OBEs (Keel et al., 2005). Maladaptive cognitive functioning may be more closely related to SBEs than to OBEs, whereas deficits in satiety function may be more closely related to OBEs. For example, the present study found that OBEs—but not SBEs—were significantly related to a history of more frequent weight fluctuation, though neither OBEs nor SBEs were correlated with BMI. Previous research has shown that a nutritional intervention designed to enhance physiological satiety substantially reduced OBEs but had no effect on SBEs (Latner & Wilson, 2004). Future research should examine the association between the two types of bulimic episode and additional physiological variables.

Considering that SBEs occur in AN, BN, BED, and EDNOS and may occur both in the presence or in the absence of concurrent OBEs, the issue of how SBEs might be incorporated in future revisions of the DSM is complex. SBEs could make up an additional diagnostic criterion for BN and BED, such that patients who engage in either OBEs or SBEs would meet criteria for these disorders. Alternatively, BN and BED could be subtyped based on the category of binge episode exhibited, particularly if future research demonstrates substantial differences between the clinical implications of these two binge types (in contrast to the present findings). Finally, forms of EDNOS characterized primarily by SBEs and their accompanying psychopathology could be included as specific disorders, depending upon further evidence of the clinical utility of such distinctions.

Acknowledgment

This investigation was supported by a University of Canterbury Research Grant. We gratefully acknowledge two anonymous reviewers for their very helpful comments on an earlier version of this manuscript.

References

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed). Washington, DC: American Psychiatric Press.
- Brown, T. A., Chorpita, B. F., Korotitsch, W., & Barlow, D. H. (1997). Psychometric properties of the depression anxiety stress scales (DASS) in clinical samples. *Behaviour Research and Therapy*, 35, 79–89.
- Crawford, J. R., & Henry, J. D. (2003). The depression anxiety stress scales (DASS): Normative data and latent structure in a large non-clinical sample. *British Journal of Clinical Psychology*, 42, 111–131.
- Devlin, M. J., Walsh, B. T., Guss, J. L., Kissileff, H. R., Liddle, R. A., & Petkova, E. (1997). Postprandial cholecystokinin release and gastric emptying in patients with bulimia nervosa. *American Journal of Clinical Nutrition*, 65, 114–120.
- Fairburn, C. G., & Bohn, K. (2005). Eating disorder NOS (EDNOS): An example of the troublesome “not otherwise specified” (NOS) category in DSM-IV. *Behaviour Research and Therapy*, 43, 691–701.

- Fairburn, C. G., & Cooper, Z. (1993). The eating disorder examination (12th ed.). In C. G. Fairburn, & G. T. Wilson (Eds.), *Binge eating: Nature, assessment, and treatment*. New York: Guilford Press.
- Garner, D. M., Olmstead, M. A., & Polivy, J. (1983). Development of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders*, 2, 15–34.
- Garner, D. M., Olmstead, M. P., Bohr, Y., & Garfinkel, P. E. (1982). The eating attitudes test: Psychometric features and clinical correlates. *Psychological Medicine*, 12, 871–878.
- Geliebter, A., Melton, P. M., McCray, R. S., Gallagher, D. R., Gage, D., & Hashim, S. A. (1992). Gastric capacity, gastric emptying, and test-meal intake in normal and bulimic women. *American Journal of Clinical Nutrition*, 56, 656–661.
- Grilo, C. M., Lozano, C., & Elder, K. A. (2005). Inter-rater and test–retest reliability of the spanish language version of the eating disorder examination interview: Clinical and research implications. *Journal of Psychiatric Practice*, 11, 231–240.
- Grilo, C. M., Masheb, R. M., Lozano-Blanco, C., & Barry, D. T. (2004). Reliability of the eating disorder examination in patients with binge eating disorder. *International Journal of Eating Disorders*, 35, 80–85.
- Halmi, K. A., Agras, W. S., Mitchell, J., Wilson, G. T., Crow, S., Bryson, S. W., et al. (2002). Relapse predictors of patients with bulimia nervosa who achieved abstinence through cognitive behavioral therapy. *Archives of General Psychiatry*, 59, 1105–1109.
- Hildebrandt, T., & Latner, J. D. (2006). Effect of self-monitoring on binge eating: Treatment response or “binge drift”? *European Eating Disorders Review*, 14, 16–22.
- Johnson, W. G., Robertson-Nay, R., Rohan, K. J., & Torgrud, L. (2003). An experimental investigation of DSM-IV binge-eating criteria. *Eating Behaviors*, 4, 295–303.
- Keel, P. K., Haedt, A., & Elder, C. (2005). Purging disorder: An ominous variant of bulimia nervosa? *International Journal of Eating Disorders*, 28, 191–199.
- Keel, P. K., Mayer, S. A., & Harnden-Fischer, J. H. (2001). Importance of size in defining binge eating episodes in bulimia nervosa. *International Journal of Eating Disorders*, 29, 294–301.
- Kerzhnerman, I., & Lowe, M. R. (2002). Correlates of subjective and objective binge eating in binge-purge syndromes. *International Journal of Eating Disorders*, 31, 220–228.
- Latner, J. D., & Wilson, G. T. (2002). Self-monitoring and the assessment of binge eating. *Behavior Therapy*, 33, 465–477.
- Latner, J. D., & Wilson, G. T. (2004). Binge eating and satiety in bulimia nervosa and binge eating disorder: Effects of macronutrient intake. *International Journal of Eating Disorders*, 36, 402–415.
- Loeb, K. L., Wilson, G. T., Gilbert, J. S., & Labouvie, E. (2000). Guided and unguided self-help for binge eating. *Behaviour Research and Therapy*, 38, 259–272.
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the depression anxiety stress scales (DASS) with the beck depression and anxiety inventories. *Behaviour Research and Therapy*, 33, 335–343.
- Meng, X.-L., Rosenthal, R., & Rubin, D. B. (1992). Comparing correlated correlation coefficients. *Psychological Bulletin*, 111, 172–175.
- Mond, J., Hay, P., Rodgers, B., Owen, C., Crosby, R., & Mitchell, J. (2006). Use of extreme weight control behaviors with and without binge eating in a community sample: Implications for the classification of bulimic-type eating disorders. *International Journal of Eating Disorders*, 39, 294–302.
- Monteleone, P., Martiadis, V., Rigamonti, A. E., Fabrazzo, M., Giordani, C., Muller, E. E., et al. (2005). Investigation of peptide YY and ghrelin responses to a test meal in bulimia nervosa. *Biological Psychiatry*, 57, 926–931.
- Morgan, C. M., Yanovski, S. Z., Nguyen, T. T., McDuffie, N. G. S., Jorge, M. R., Keil, M., et al. (2002). Loss of control over eating, adiposity, and psychopathology in overweight children. *International Journal of Eating Disorders*, 31, 430–441.
- Niego, S. H., Pratt, E. M., & Agras, W. S. (1997). Subjective or objective binge: Is the distinction valid? *International Journal of Eating Disorders*, 22, 291–298.
- Peterson, C. B., Crow, S. J., Nugent, S., Mitchell, J. E., Engbloom, S., & Mussell, M. P. (2000). Predictors of treatment outcome for binge eating disorder. *International Journal of Eating Disorders*, 28, 131–138.
- Picot, A. K., & Lilenfeld, L. R. R. (2003). The relationship among binge severity, personality psychopathology, and body mass index. *International Journal of Eating Disorders*, 34, 98–107.
- Pratt, E. M., Niego, S. H., & Agras, W. S. (1998). Does the size of a binge matter? *International Journal of Eating Disorders*, 24, 307–312.
- Rizvi, S. L., Peterson, C. B., Crow, S. J., & Agras, W. S. (2000). Test–retest reliability of the eating disorder examination. *International Journal of Eating Disorders*, 28, 313–316.
- Rosen, J., Vara, L., Wendt, S., & Leitenberg, H. (1990). Validity studies of the eating disorders examination. *International Journal of Eating Disorders*, 9, 519–528.
- Safer, D. L., Lively, T. J., Telch, C. F., & Agras, W. S. (2002). Predictors of relapse following successful dialectical behavior therapy for binge eating disorder. *International Journal of Eating Disorders*, 32, 155–163.
- Schoemaker, C., van Strien, T., & van der Staak, C. (1994). Validation of the eating disorders inventory in a nonclinical population using transformed and untransformed responses. *International Journal of Eating Disorders*, 15, 387–393.
- Stice, E., Fisher, M., & Lowe, M. R. (2004). Are dietary restraint scales valid measures of acute dietary restriction? Unobtrusive observational data suggest not. *Psychological Assessment*, 16, 51–59.
- Stunkard, A. J., & Messick, S. (1985). The three-factor eating questionnaire to measure dietary restraint, disinhibition, and hunger. *Journal of Psychosomatic Research*, 29, 71–83.
- Telch, C. F., Pratt, E. M., & Niego, S. H. (1998). Obese women with binge eating disorder define the term binge. *International Journal of Eating Disorders*, 24, 313–317.
- Tobin, D. L., Griffing, A., & Griffing, S. (1997). An evaluation of subtype criteria for bulimia nervosa. *International Journal of Eating Disorders*, 22, 179–186.

- Turner, H., & Bryant-Waugh, R. (2004). Eating disorder not otherwise specified (EDNOS): Profiles of clients presenting at a community eating disorder service. *European Eating Disorders Review*, 12, 18–26.
- Walsh, B. T., Fairburn, C. G., Mickley, D., Sysko, R., & Parides, M. K. (2004). Treatment of bulimia nervosa in a primary care setting. *American Journal of Psychiatry*, 161, 556–561.
- Wilson, G. T., Fairburn, C. G., Agras, W. S., Walsh, B. T., & Kraemer, H. (2002). Cognitive behavior therapy for bulimia nervosa: Time course and mechanisms of change. *Journal of Consulting and Clinical Psychology*, 70, 267–274.