A Study of the Validity of the Eating Disorder Examination

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Abstract

The Eating Disorder Examination (EDE), an investigator-based interview, and the questionnaire version of the EDE (EDE-Q) are considered the preeminent assessments of eating disorder symptoms. Despite their status as gold-standard eating disorder assessments, research on the psychometric properties of these measures is limited. The current studies aimed to enhance these data, specifically with regard to the convergence of the EDE and EDE-Q and the validity of the EDE in the assessment of binge eating. For the first study, a meta-analysis of 15 studies on the convergent validity of the EDE and EDE-Q using correlation coefficients and Cohen's d was conducted. The results demonstrated convergence between the EDE and EDE-Q for the assessment of cognitive symptoms and compensatory behaviors, but limited convergence for the assessment of binge eating. A second study compared the frequency of binge eating recalled on the EDE to that reported in Daily Food Records (DFRs) by 34 participants. The results demonstrated convergence between the EDE and DFRs for the assessment of Objective Bulimic Episodes and Total binge frequency in Month 1. These studies suggest that the EDE and EDE-Q assess similar constructs, but indicate that they should not be used interchangeably. Additionally, the data provide preliminary support for the use of the EDE in the assessment of binge eating during the past month.

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OVERVIEW OF THE DISSERTATION AND LITERATURE REVIEW

Introduction

Eating disorders are serious mental illnesses that are difficult to treat, and reportedly have the highest mortality rates of any mental illness (Hoek, 2006). Three eating disorders currently are included in the Diagnostic and Statistical Manual for Mental Disorders (DSM), 4th edition, Text Revision (DSM-IV-TR; American Psychiatric Association, 1994): Anorexia Nervosa (AN), Bulimia Nervosa (BN), and Eating Disorder Not Otherwise Specified (EDNOS). However, with the 5th edition of the DSM on the horizon, the validity of these diagnoses is being questioned. As the issue of diagnostic validity takes center stage, the issue of the validity of eating disorder assessment is of increased importance. Without valid assessments of the symptomatology associated with eating disorders, diagnostic criteria cannot be implemented.

The Eating Disorder Examination (EDE) is a semi-structured interview that assesses the cognitive and behavioral symptoms associated with eating disorders (Fairburn & Cooper, 1993). The EDE is widely considered the preeminent eating disorder assessment (Wilson, 1993). Researchers and clinicians alike use the EDE to obtain descriptive information, to assess dependent variables in studies, and as a diagnostic tool. Its status as the gold standard of eating disorder assessment has also given the EDE the weighty responsibility of serving to validate other assessments (e.g., Grilo, Masheb, & Wilson, 2001a; Reas, Grilo, & Masheb, 2006).

Organization of the Dissertation

This dissertation is organized as follows. First, I briefly review the pathology of eating disorders, placing emphasis on the diagnostic criteria outlined by the DSM-IV-TR. I then introduce the EDE and discuss its diagnostic importance, specifically with regard to the assessment of binge eating. Next, I describe two studies designed to examine the validity of the EDE. The first is a quantitative review of the extant research on the convergent validity of the EDE and EDE-Q using meta-analysis. The second study examines the convergent and discriminant validity of the EDE with regard to the assessment of binge eating. The description of each study includes a literature review on the psychometric properties of the EDE most relevant to that particular study as well as details regarding the method, results, implications, and limitations of the study.

Brief Review of the Pathology of Eating Disorders

The DSM-IV-TR (APA, 1994) acknowledges three types of eating disorders: Anorexia Nervosa (AN), Bulimia Nervosa (BN), and Eating Disorder Not Otherwise Specified (EDNOS). AN is characterized by refusal to maintain a body weight of at least 85% of the ideal body weight for age and height, an intense fear of becoming fat or overweight even when underweight, body image distortions, overvaluation of shape and weight, denial of illness, and amenorrhea (in postmenarcheal females). BN is also characterized by an overvaluation of shape and weight, but the primary criteria are discrete episodes of overeating and compensatory behavior (e.g., self-induced vomiting, laxative or diuretic use, fasting, excessive exercise) that must occur at least twice per week for three months. Any other symptom pattern that represents clinically significant disordered eating is diagnosed as EDNOS. One example of EDNOS outlined in the

DSM-IV-TR is Binge Eating Disorder (BED) which is characterized primarily by eating unusually large amounts of food in a discrete period of time with feelings of loss of control over eating that are not followed by any compensatory behavior. The overeating episodes must occur at least twice a week for 6 months and are characterized by eating more rapidly than normal, eating large amounts of food when not physically hungry, eating until feeling uncomfortably full, eating alone because of embarrassment, and feeling disgusted with oneself, depressed, or very guilty after the episodes (APA, 1994). Although BED is not recognized as a separate diagnosis in the DSM-IV-TR (1994), there is strong support for its validity as a separate diagnosis (Wilfley, Bishop, Wilson, & Agras, 2007).

A review of epidemiologic research has found prevalence rates ranging from 0% to 0.9% for AN in women ages 12 to 22 and from 0.0% to 4.5% for BN in women ages 12 to 44 (Hoek & van Hoeken, 2003). The average prevalence rates in women are 0.3% and 1.0% for AN and BN, respectively. EDNOS is the most common eating disorder, accounting for approximately 60% of eating disorder cases (Hoek, 2006). One study found the prevalence rate of EDNOS to be 2.4% among females (Machado, Machado, Gonçalves, & Hoek, 2007). Additionally, studies using community samples have found high rates of binge eating and compensatory behaviors in adolescents and college students (e.g., Katzman, Wolchik, & Braver, 1984; le Grange, Lock, & Dymeck, 2003).

Although not as common as some psychiatric disorders, both AN and BN can cause serious medical complications such as amenorrhea, anemia, bradycardia, high cholesterol, fluid and electrolyte imbalance, hypokalemia, cardiac murmur, dull or thinning hair, lanugo, and exhaustion (American Academy of Pediatrics, 2003). Although many of these physical complications are reversible, some are not. For example, bone density loss is associated with eating disorders and can lead to increased rates of osteopenia, osteoporosis, and fractures (Crow, 2005). Bone matter can start to decline as early as age 30; thus, bone loss density loss can be difficult if not impossible to correct (Crow, 2005). Additionally, AN is commonly cited as having the highest mortality rate of any mental illness, with mortality rates ranging from 3.3% to 18% (Hoek, 2006). The most common causes of mortality in AN are suicide and complications from the eating disorder such as cardiac failure (Hoek, 2006).

The number and severity of the medical complications associated with eating disorders make it imperative that effective treatments are identified. The efficacy of Cognitive Behavioral Therapy (CBT) for treating adult BN and Family Based Therapy (FBT) for treating adolescent AN is well-documented (le Grange & Lock, 2005). There is also preliminary research supporting the efficacy of Interpersonal Therapy (IPT) in the treatment of adult BN and FBT in the treatment of adolescents with BN (Wilson, Grilo, & Vitousek, 2007). Unfortunately, no empirically-supported treatment for adult AN has been identified (le Grange & Lock, 2005). Because research has found that AN and BN do not necessarily respond to the same treatments, it is important to find reliable, valid assessments of diagnostic status so that clients receive the best care possible.

Description of the Eating Disorder Examination

The EDE (Fairburn & Cooper, 1993) is a semi-structured interview as it includes required questions that must be asked, but allows the interviewer to ask individuallytailored follow-up questions that may be necessary to rate an item. The EDE has four subscales that focus primarily on cognitive symptoms: Restraint, Eating Concern, Shape Concern, and Weight Concern. The EDE also includes a section that asks respondents about behavioral symptoms, specifically, the frequency of binge eating and compensatory behaviors. Most of the questions are based on the 28 day time period prior to the day of assessment. However, respondents are asked to report the frequency of binge eating and compensatory behaviors for up to the past 6 months as well. This time frame allows the EDE to be used as a diagnostic instrument.

The EDE is comprised of approximately 46 items. Most of the questions are rated on a 7-point Likert scale, ranging from 0 (asymptomatic) to 6 (severe); the exceptions are those questions that ask for specific numerical responses (e.g., frequency of binge eating and compensatory behaviors, frequency of self-weighing, ideal weight). Many of the Likert-scaled items are combined to form the following 4 subscales: Restraint, Eating Concern, Shape Concern, and Weight Concern. The Restraint subscale, which assesses the extent to which the person is restrictive in the amount or types of food eaten has 5 items (e.g., “Over the past four weeks, have you been consciously trying to restrict the overall amount that you eat, whether or not you have succeeded?”) The Eating Concern subscale, which asks respondents the extent to which they feel preoccupied and distressed about eating and whether they have avoided eating with others, also has 5 items (e.g., . “Over the past four weeks, have you been afraid of losing control over eating?”) The Shape Concern subscale includes 8 questions that address the level of importance respondents place on their shape and how they feel about their own shape (e.g., “Over the past four weeks have you been dissatisfied with your overall shape?") Finally, the Weight Concern subscale is comprised of 5 items that provide information on the level of importance respondents place on their weight and how they feel about their weight (e.g., . "Over the past four weeks, have you wanted to weigh less?")

The EDE begins by orienting the respondent to the time frame. A calendar for the past 28 days is provided and respondents are asked to describe any events during that month that would help them remember the time period (e.g., days off of work or school, holidays, vacations, celebrations, major life events). Research in alcohol dependence has found that orienting participants to the time period relevant to the assessment is associated with higher test-retest reliability (e.g., Sobell, Maisto, Sobell, & Cooper, 1979; Sobell, Sobell, Klajner, Pavan & Basian, 1986). The first section of the EDE focuses on questions related to food and eating. Respondents are asked to describe their general pattern of eating during the past 28 days, specifically whether their pattern varied much day to day, whether their pattern varied on the weekend, and if there were any days when they ate nothing at all. The respondents are then asked to quantify exactly how many days of the past 28 days they ate the following meals or snacks: breakfast, mid-morning snack, lunch, mid-afternoon snack, dinner, evening snack, and nocturnal snack. Questions that comprise the Restraint and Eating Concern subscales conclude the first section of the EDE.

The second section of the EDE focuses on assessing the frequency of binge eating and compensatory behaviors. The EDE assesses only those eating episodes in which the respondent believes they have eaten too much food. Respondents are first asked: "I would like to ask you about any episodes of overeating, or loss of control over eating, that you might have had over the past four weeks. Different people mean different things by overeating. I would like you to describe any times when you have felt that you have eaten too much in one go (at one time).” Additional probes include: “And any times you have felt you have lost control over eating?,” “Have there been any times when you have felt that you have eaten too much, but others might not agree?,” and “Have there been any times when you have felt that you have eaten an ordinary amount of food but others might have regarded you as having overeaten?”

These eating episodes are classified regarding whether the eating episode was objectively large and whether the respondents felt a sense of loss of control during the episode. Objective Bulimic Episodes (OBEs) are episodes in which the respondent has eaten an objectively large amount of food and felt a loss of control during the episode and correspond to the definition of binge eating episodes in the DSM-IV-TR. When respondents have eaten an amount of food that would not be considered objectively large, but still feel a sense of loss of control, the episode is classified as a Subjective Bulimic Episode (SBE). If a respondent has an eating episode in which they ate an objectively large amount of food, but has not felt a sense of loss of control, the episode is classified as an Objective Overeating Episode (OOE). Eating episodes in which the respondent does not eat an objectively large amount of food and has not felt a sense of loss of control are defined as Subjective Overeating Episodes (SOEs). During SOEs, although the respondent has not eaten an objectively large amount of food, the respondent believes that s/he has overeaten. The EDE assesses the frequency of OBEs, SBEs, and OOEs; the frequency of SOEs is not assessed because these types of episodes are not considered pathological. Respondents are asked to report the number of days on which each of these types of eating episodes occurred as well as the total number of each episode that occurred during the 28 days. Additionally, the frequency of self-induced vomiting, laxative misuse, diuretic misuse, and driven exercise during the past 28 days are also assessed. As stated previously, the frequency of some items (e.g., OBEs, self-induced vomiting, etc.) may be estimated for a longer duration (e.g., 3 months, 6 months) to facilitate the diagnosis of an eating disorder.

The final section of the EDE includes items on the Shape Concern and Weight Concern subscales and focuses on assessing cognitive symptoms of eating disorders related to shape and weight. The EDE distinguishes between shape, which is thought of as a person's figure, and weight, which is the number a person sees on a scale. For many people with eating disorders, shape and weight are interchangeable. However, anecdotal evidence suggests that for some people with eating disorders, the focus is on shape whereas for others, the focus is on weight. Respondents are asked to rate their level of dissatisfaction with their shape/weight, the importance of their shape/weight in terms of their evaluation of themselves, fear of weight gain, how uncomfortable they feel seeing their body or others seeing their body, etc. These questions are necessary to establish diagnostic status, but to also determine the severity of the respondent's symptoms.

Diagnostic Importance of the Eating Disorder Examination

The DSM-IV-TR (APA, 1994) criteria for diagnoses of Bulimia Nervosa (BN) and Binge Eating Disorder (BED) both require the presence of binge-eating episodes. In contrast to the many cognitive variables that characterize eating disorders, binge eating is one of the few behavioral markers of BN and BED. Thus, the frequency of binge eating gives researchers and clinicians an important objective measure of disordered eating behavior that can be used to supplement information regarding a client's subjective experience. In addition to its use in diagnosis, the frequency of binge eating has been used to assess severity of symptoms, to define treatment goals, and as a dependent variable in treatment studies. Its necessity to both research and clinical practice makes it imperative to identify ways of measuring binge eating in a reliable and valid manner.

The DSM-IV-TR defines binge eating as "eating, in a discrete period of time, an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances" (APA,1994). Due to the ambiguity of this definition, the EDE attempts to clarify the definition of binge eating (Fairburn & Cooper, 1993). In addition to distinguishing between OBEs, SBEs, and OOEs, the EDE includes guidelines for determining whether an eating episode is objectively large. The general guideline is that if the person consumed two full meals, each of which included two courses, or if the person consumed three entrees, that episode should be considered large. Also included in the EDE are guidelines for the amount of specific foods that would need to be consumed to rate an episode "large" (e.g., four conventional slices of cake, six cups of dry cereal). Although the EDE contains specific guidelines, the interviewer is allowed to take the circumstances surrounding the eating episode into account when determining whether an episode is large (e.g., Thanksgiving Day). The primary purpose of these guidelines is to increase the reliability and validity of the assessment of binge eating.

VALIDATION OF THE EATING DISORDER EXAMINATION

Study 1: Examination of the Convergent Validity of the EDE and EDE-Q using Meta-analysis

Literature Review

Due in part to its specificity in defining binge eating, the EDE has been described as the most accurate assessment of eating disorders (Wilson, 1993). Unfortunately, the EDE is lengthy to administer and requires significant amounts of assessor training. A questionnaire version of the EDE (EDE-Q) was developed to address these limitations by assessing the same constructs as the EDE in a self-report measure. The EDE-Q includes the same items used to generate the Restraint, Eating Concern, Shape Concern, and Weight Concern subscales as well as items used to determine the frequency of OBEs, SBEs, and compensatory behaviors. Additionally, the EDE-Q items are worded almost identically to those in the EDE. The primary difference between the EDE and EDE-Q is that the EDE allows a trained assessor to clarify concepts and ask additional questions. The psychometric properties of the EDE and EDE-Q have been examined in depth. The following review will describe the reliability of the EDE and EDE-Q, the validity of the EDE and EDE-Q, and the convergent validity of the EDE and EDE-Q.

Both instruments have demonstrated test-retest reliability (e.g., Grilo, Masheb, Lozano-Blanco, & Barry, 2003; Reas, Grilo, & Masheb, 2006) and acceptable internal consistency (e.g., Grilo, Crosby, Peterson, Masheb, White, Crow, et al., in press;

Peterson, Crosby, Wonderlich, Joiner, Crow, & Mitchell, 2007) for the four subscales (i.e., Restraint, Eating Concern, Shape Concern, and Weight Concern). Additionally, research supports the interrater reliability of the EDE (Grilo et al., 2003). For a more detailed description of the reliability of the EDE and EDE-Q, please refer to Appendices A and B respectively. The validity of these instruments has also been assessed. For a complete discussion of the process of validation, please refer to Appendix C. Both the EDE and EDE-Q have demonstrated an ability to distinguish between eating disorder and non-eating disorder cases (e.g., Cooper, Cooper, & Fairburn, 1989; Mond, Hay, Rodgers, Owen, & Beumont, 2004b) and the data indicate that the subscales of these assessments are significantly related to measures of similar constructs (e.g., Loeb, Pike, Walsh, & Wilson, 1994; Grilo, Masheb, & Wilson, 2001a). Factor analyses of the EDE and EDE-Q provide limited support for the presence of four subscales (e.g., Byrne, Allen, Lampard, Dove, & Fursland, in press; Hrbabosky, White, Masheb, Rothschild, Burke-Martindale, & Grilo, 2008). For a more detailed description of the validity research on the EDE and EDE-Q, please refer to Appendices D and E respectively.

As stated earlier, the EDE and EDE-Q include the same items used to generate the Restraint, Eating Concern, Shape Concern, and Weight Concern subscales as well as to determine the frequency of OBEs, SBEs, and compensatory behaviors. Given that the EDE and EDE-Q purport to assess the same constructs with the only difference being the modality of the assessment, the relationship between the two instruments should be strong. Based on the theory outlined by the Multitrait-Multimethod (MTMM) matrix (Campbell & Fiske, 1959), the relationship between the EDE and EDE-Q should be stronger than the relationship between the EDE and an interview-based assessment of another construct. Similarly, the relationship between the EDE and EDE-Q should be stronger than the relationship between the EDE-Q and a self-report assessment of another trait. Although no published study has examined the relative convergent validity of the EDE or EDE-Q using a MTMM matrix, several studies have assessed the absolute convergent validity of the EDE and EDE-Q.

Overall, 15 studies have reported statistics related to the convergent validity of the EDE and EDE-Q (Binford, le Grange, & Jellar, 2005; Black & Wilson, 1996; Carter, Aimé, & Mills, 2001; de Zwaan et al., 2004; Fairburn & Beglin, 1994; Goldfein, Devlin, & Kamenetz, 2005; Grilo et al., 2001a; Grilo, Masheb, & Wilson, 2001b; Kalarchian, Wilson, Brolin, & Bradley, 2000; Mond et al., 2004b; Passi, Bryson, & Lock, 2003; Sysko, Walsh, & Fairburn, 2005; Sysko, Walsh, Schebendach, & Wilson, 2005; Wilfley, Schwartz, Spurrell, & Fairburn, 1997; Wolk, Loeb, & Walsh, 2005). Two of these studies reported statistics for more than one sample (Binford et al, 2005; Fairburn & Beglin, 1994); thus, there were 18 possible comparisons between the EDE and EDE-Q[1]. The results of these analyses indicate significant positive correlations between scores on the EDE and scores on the EDE-Q for all four subscales. However, the vast majority of analyses found significant differences between scores on the EDE and scores on the EDE-Q, with participants scoring higher on the EDE-Q than the EDE. These results suggest that subscale scores on the EDE and EDE-Q increase and decrease together, but

[1] Two studies reported scores on the EDE and EDE-Q for the same sample at two different time points, specifically pre- and post-treatment (Sysko, Walsh, & Fairburn, 2005; Sysko, Walsh, Schebendach, et al., 2005). It is unclear whether participation in a treatment study may influence the correspondence of the EDE and EDE-Q; therefore, only pre-treatment scores are discussed in this review.

that there is a significant difference in severity level reported on the two instruments. Comprehensive summaries of the convergent validity of the EDE and EDE-Q for the four subscales are provided in Table 8-11.

With regard to the assessment of binge eating, the convergent validity of the EDE and EDE-Q is less consistent. The correlations between the frequency of OBEs reported on the EDE and EDE-Q were low, with 12 of the 14 correlations ranging from .20 to .63 and two not reaching significance. Seven of the 14 studies found significant differences between the frequency of OBEs reported on the EDE and EDE-Q, with about half of those finding that participants reported more OBEs on the EDE than the EDE-Q and half finding the opposite. With regard to the frequency of SBEs, five of the eight studies found significant positive correlations between the EDE and EDE-Q and two of the eight studies found significant differences between the two instruments.

With regard to the frequency of self-induced vomiting, all studies found significant positive correlations between the EDE and EDE-Q ranging from .72 to 1.00. Two of the seven studies that calculated mean differences between the EDE and EDE-Q for the frequency of self-induced vomiting found significant differences between the two measures. Likewise, all seven studies found significant positive correlations between the EDE and EDE-Q for the frequency of laxative misuse, with correlations ranging from .60 to .99. Only one of seven studies found a significant difference between the two measures for the frequency of laxative misuse. Overall there is a dearth of research on the convergent validity of the EDE and EDE-Q with regard to the assessment of other compensatory behaviors such as fasting, excessive exercise, and diuretic misuse. Please refer to Tables 12-14 for detailed summaries of the convergent validity of the EDE and EDE-Q with regard to the assessment of OBEs, SBEs, and compensatory behaviors. For a more complete discussion of the empirical findings on the convergent validity of the EDE and EDE-Q, please refer to Appendix F.

Limitations of Studies Assessing the Convergent validity of the EDE and EDE-Q

Despite that more than one dozen studies have assessed the convergent validity of the EDE and EDE-Q, there are important limitations to this body of research. First, most of this research has used correlations and significance testing to assess convergent validity. Unfortunately, correlations can only tell us whether there is a relationship between scores on two measures. These relationships may exist in the presence *or* absence of significant differences between mean scores on the two measures. Likewise, significance testing is limited because it is based on both the size of the effect and the sample size and it is difficult to separate the two. Without an understanding of the size of the difference between the EDE and EDE-Q, it is impossible to know whether the EDE and EDE-Q arrive at similar conclusions regarding symptom presentation. Second, due to the small sample sizes used in the convergent validity studies of the EDE and EDE-Q, it is difficult to generalize the findings. Thus, meta-analyses using both correlation coefficients and Cohen's d are needed to better understand the extent to which the EDE and EDE-Q converge. Both types of meta-analyses are needed as one provides information regarding the strength of the relationship between the two instruments and one provides information regarding the size of difference between the two instruments.

The purpose of this study was to address the two main limitations described above by analyzing the convergent validity of the EDE and EDE-Q using effect sizes and a meta-analytic strategy. Effect sizes calculated using Cohen’s d have the advantage of giving information about the size of the effect without being confounded by sample size[2]. A second advantage of using effect sizes is that they are standardized, which allows researchers to compare effects across studies or for researchers to combine effect sizes from different studies to determine the overall effect. In addition to assessing the size of the difference between the two studies using a meta-analysis of Cohen’s d effect sizes, a meta-analysis using correlation coefficients was conducted to determine the overall strength of the relationship between EDE and EDE-Q scores.

Method

Procedure

A literature search was conducted for studies that assessed the convergent validity of the EDE and EDE-Q using a major computer database (i.e., PsycINFO) and reviewing reference lists from published journal articles and books. Search terms used in PsycINFO included “Eating Disorder Examination” and “Eating Disorder Examination-Questionnaire.” Studies were included that assessed the convergent validity of the EDE and EDE-Q using correlation coefficients and/or a comparison of means. The literature search was inclusive of studies that assessed the convergent validity of the Restraint subscale, the Eating Concern subscale, the Shape Concern subscale, the Weight Concern

[2] An effect size provides information about the overlap of two samples and is equivalent to a Z-score statistic. Essentially, an effect size of 1.0 means that the average score in one sample exceeds the scores of 84% of the scores in the second sample or that the average score of one sample is 1 standard deviation larger than the mean score of the second group. A d = .2 is considered a small effect size, d = .5 is considered a medium effect size, and d = .8 is considered a large effect.

subscale, OBEs, SBEs, self-induced vomiting, laxative misuse, diuretic misuse, excessive exercise, or fasting. If a study did not include means and standard deviations for the EDE and EDE-Q, or correlations between the EDE and EDE-Q, the investigator attempted to contact the primary author to obtain these statistics. Of the three authors contacted, all three responded and provided data for three of the four studies that had missing data. A study was excluded from the meta-analysis only if the statistics necessary to conduct the meta-analysis (e.g., means, standard deviations, correlation coefficients) were not reported. It should be noted that if a particular study was excluded from the meta-analysis using Cohen's d, it could have been used for the meta-analysis using correlation coefficients and vice versa.

Data Analysis Plan

The data analysis plan included three parts. There were four steps for the meta-analysis using Cohen's d (Lipsey & Wilson, 2001). The first step was to calculate effect sizes, based on Cohen's d, for all comparisons of the EDE and EDE-Q. Cohen's d was calculated by subtracting the mean EDE from the mean EDE-Q score such that positive numbers indicate higher scores on the EDE-Q and then dividing the result by the pooled standard deviation of the EDE and EDE-Q scores. Separate effect sizes were calculated in each study for each eating disorder behavior in each applicable subsample. For example, if a study examined the convergent validity of the EDE and EDE-Q for OBEs and self-induced vomiting in a BN sample and a community sample, separate effect sizes were calculated for the frequency of OBEs reported in the BN sample, the frequency of OBEs reported in the community sample, the frequency of self-induced vomiting reported in the

BN sample, and the frequency of self-induced vomiting reported in the community sample.

The second step was to adjust each effect size for the size of the sample used to calculate the effect size. Although effect sizes are not confounded by sample size, they only represent estimates of the true effect size. Essentially, effect sizes can be thought of as the true effect size plus error. Effect sizes based on larger samples have smaller standard errors; thus, they are considered more accurate estimates of the true effect size. To adjust effect sizes for the size of the sample, each effect size was weighted by its inverse variance weight. The inverse variance weight (w) was calculated by dividing 1 by the squared standard error of the effect size (i.e., $w = 1 / SE^2$). Each effect size was then multiplied by its respective inverse variance weight.

The third step was to calculate the mean weighted effect sizes ($MWES_d$) by averaging the effect sizes that have been weighted using the inverse variance weight. The $MWES_d$ is calculated by dividing the sum of the weighted effect sizes by the sum of the inverse variance weights (i.e., $MWES_d = \Sigma(w*ES) / \Sigma w$). The $MWES_d$ was calculated for each eating disorder behavior in each subsample (e.g., $MWES_d$ of all studies that assessed the frequency of OBEs in participants with BN using the EDE and EDE-Q) as well as the total $MWES_d$ for each eating disorder behavior (e.g., $MWES_d$ for all studies that assessed the frequency of OBEs using the EDE and EDE-Q).

The final step was to calculate the Confidence Interval (CI_d) around each $MWES_d$. To determine the upper and lower limits of CI_d, one needs to first calculate the standard error of the $MWES_d$ (SE_{MWESd}), which can be found by taking the square root of

1 divided by the sum of the inverse variance weights (i.e., $SE_{MWES} = \sqrt{(1 / (\Sigma w))}$). The final calculation for the CI_d is as follows: $CI_d = MWES_d \pm (1.96 * SE_{MWESd})$.

In this study, small effect sizes (Cohen's d) represent small differences between the EDE and EDE-Q and thus higher convergent validity between the two instruments. It was hypothesized that the mean weighted effect size for each of the four subscales would be smaller than the mean weighted effect size for the frequency of OBEs, SBEs, and compensatory behaviors.

With regard to the meta-analysis using correlation coefficients, there were 7 steps (Lipsey & Wilson, 2001). The first step was to identify all correlation coefficients between the EDE and EDE-Q for all eating disorder behaviors in all applicable samples. The second step was to standardize each correlation coefficient using Fisher's z' transformation, which is calculated using the following formula: $z' = .5 * \ln((1+r) / (1-r))$.

The third step was to adjust each transformed correlation coefficient (z') for the sample size as was done for each Cohen's d. To adjust z' for the size of the sample, each z' was weighted by its inverse variance weight. The inverse variance weight (w) for correlation coefficients is calculated by subtracting 3 from the sample size (i.e., $w = n – 3$). Each z' is then multiplied by its respective inverse variance weight.

The fourth step was to calculate the mean weighted effect sizes using the correlation coefficients ($MWES_r$) by averaging the correlation coefficients that have been weighted using the inverse variance weights. The $MWES_r$ was calculated by dividing the sum of the weighted effect sizes by the sum of the inverse variance weights (i.e., $MWES_r$

$= \Sigma(w*z') / \Sigma w$). The $MWES_r$ was calculated for each eating disorder behavior in each subsample (e.g., $MWES_r$ of all studies that assessed the frequency of OBEs in participants with BN using the EDE and EDE-Q) as well as the total $MWES_r$ for each eating disorder behavior (e.g., $MWES_r$ for all studies that assessed the frequency of OBEs using the EDE and EDE-Q). The fifth step was to reverse transform the $MWES_r$ back from z' to r using the following formula: $r = (e \wedge (2* MWES_r) – 1) / (e \wedge 2* MWES_r) + 1)$.

The sixth step was to calculate the Confidence Interval (CI_r) around each $MWES_r$. To determine the upper and lower limits of the CI_r, one needs to first calculate the standard error of the $MWES_r$ (SE_{MWESr}) by dividing 1 by the square root of n minus 3 (i.e., $SE_{MWESr} = 1 / \surd (n-3)$). The final calculation for the CI_r is as follows: $CI_r = MWES_r \pm (MWES_r * SE_{MWESr})$. The final step was to back transform the upper and lower limits of the CI from z' to r using the formula described in step 5 above.

Finally, a homogeneity analysis was conducted for both types of meta-analyses. Meta-analytic techniques assume that all effect sizes used in the meta-analysis are estimating the same population mean. A homogeneity analysis tests whether this assumption holds true. If the homogeneity assumption is rejected, the effect sizes are estimates of at least two populations that have different mean scores. This type of analysis is of particular importance to this study as this meta-analysis purposefully includes studies that sampled different populations (e.g., AN sample, BN sample, EDNOS sample, BED sample, community sample, bariatric surgery patients). Thus, it is important to test the homogeneity assumption and determine whether these populations have similar means on the EDE and EDE-Q, respectively.

The homogeneity assumption is tested using the Q statistic which is calculated as follows: $Q = \sum (w * ES^2) – ((\sum (w * ES))^2) / \sum (w)$. The Q statistic is distributed as a chi-square statistic and is interpreted in a similar fashion. The critical value for the Q statistic is the same as the critical value for a chi-square statistic, with the degrees of freedom for the Q statistic equaling the number of effect sizes used minus 1. The homogeneity assumption is upheld if the Q statistic is less than the critical value.

If the homogeneity assumption is rejected, an additional heterogeneity analysis can be done to determine what is responsible for the heterogeneity of effect sizes. Because the meta-analysis included studies that used different samples, it is important to determine whether the heterogeneity of effect sizes is due to differences in mean effect sizes between populations. Thus, if the homogeneity assumption was rejected, the studies were divided categorically based on the study sample used. Heterogeneity among categorical variables can be tested using the meta-analytic analog to the ANOVA. In this analysis, a Q statistic is computed for each categorical group using the formula described above. Then a within-group Q (Q_w) is calculated using the following formula: $Q_w = Q_{Group1} + Q_{Group2} + … + Q_{GroupN}$ with the degrees of freedom (*df*) equaling k – j, where k is the number of effect sizes and j is the number of groups. Next a between group Q (Q_B) is calculated by subtracting Q_w from the total Q, where *df* = j-1. A significant Q_w would indicate that differences among effect sizes are due to error whereas a significant Q_B

would indicate that differences among effect sizes are due to true differences between groups.

Results

Restraint

The results of the meta-analysis demonstrate support for the convergent validity of the Restraint subscale of the EDE and EDE-Q. With regard to the meta-analysis using Cohen's d, effect sizes for the 15 individual samples ranged from -0.09 to 0.73 with a mean effect size of 0.31 (95% CI: 0.22 – 0.40) with participants scoring higher on the EDE-Q than the EDE. The homogeneity analysis failed to reject the null hypothesis of homogeneity which indicates that there are not differences in the mean effect sizes across studies, Q(13) = 16.27, *p* > .05. With regard to the meta-analysis using correlation coefficients, the effect sizes for the individual studies ranged from .49 to .85, with a mean effect size of .72 (95% CI: .65 - .78). Again, the homogeneity analysis failed to reject the null hypothesis of homogeneity; therefore, the variability across effect sizes does not exceed what would be expected given errors in sampling Q(13) = 9.04, *p* >.05. These statistics can be found in Tables 15 and 16.

Eating Concern

The results of the meta-analysis demonstrate moderate support for the convergent validity of the Eating Concern subscale of the EDE and EDE-Q. With regard to the meta-analysis using Cohen's d, effect sizes for the individual studies ranged from 0.11 to 1.76 with a mean effect size of 0.58 (95% CI: 0.49 – 0.67) with participants scoring higher on the EDE-Q than the EDE. The homogeneity analysis did reject the null hypothesis of homogeneity which indicates that there are significant differences in the mean effect sizes across studies Q(13) = 48.02, *p* < .001. Results from the heterogeneity analysis indicated that both Q_B and Q_w were significant (Q_B(6) = 19.71, *p* < .01; Q_w(7) = 28.38, *p* <.001) suggesting that the between-group variability was not sufficient to explain the variance among mean effect sizes. With regard to the meta-analysis using correlation coefficients, the effect sizes for the individual studies ranged from .33 to .94, with a mean effect size of .65 (95% CI: .57 - .73). The homogeneity analysis failed to reject the null hypothesis of homogeneity; therefore, the variability across effect sizes does not exceed what would be expected given errors in sampling, Q(10) = 13.91, *p* > .05. These statistics can be found in Tables 15 and 16.

Shape Concern

The results of the meta-analysis demonstrated moderate support for the convergent validity of the Shape Concern subscale of the EDE and EDE-Q. With regard to the meta-analysis using Cohen's d, effect sizes for the individual studies ranged from -0.06 to 1.72 with a mean effect size of 0.56 (95% CI: 0.47 – 0.65) with participants again scoring higher on the EDE-Q. The homogeneity analysis did reject the null hypothesis of homogeneity which indicates that there are significant differences in the mean effect sizes across studies Q(14) = 77.42, *p* < .001. Results from the heterogeneity analysis indicate that both Q_B and Q_w were significant (Q_B(6) = 58.69, *p* < .001; Q_w(8) = 18.73, *p* <.05) suggesting that the between-group variability is not sufficient to explain the variance among mean effect sizes. With regard to the meta-analysis using correlation coefficients, the effect sizes for the individual studies ranged from .42 to .91 with a mean effect size of

.76 (95% CI: .70 - .83). The homogeneity analysis failed to reject the null hypothesis of homogeneity; therefore, the variability across effect sizes does not exceed what would be expected given errors in sampling, Q(14) = 16.50, *p* > .05. These statistics can be found in Tables 15 and 16.

Weight Concern

The results of the meta-analysis demonstrate support for the convergent validity of the Weight Concern subscale of the EDE and EDE-Q. With regard to the meta-analysis using Cohen's d, effect sizes for the individual studies ranged from -0.25 to 0.73 with a mean effect size of 0.39 (95% CI: 0.31 – 0.48) with participants scoring higher on the EDE-Q than the EDE. The homogeneity analysis did reject the null hypothesis of homogeneity which indicates that there are significant differences in the mean effect sizes across studies Q(14) = 29.30, *p* < .01. Results from the heterogeneity analysis indicate that only Q_B was significant (Q_B(6) = 18.99, *p* < .01; Q_w(8) = 10.31, *p* > .05) suggesting that the between-group variability is sufficient to explain the variance among mean effect sizes. With regard to the Weight Concern subscale, the difference between the EDE and EDE-Q appeared to be higher for the BED samples (d=.69) than the other eating disorder or community-based samples (d=-.11 to .44). With regard to the meta-analysis using correlation coefficients, the effect sizes for the individual studies ranged from .54 to .88 with a mean effect size of .75 (95% CI: .69 - .81). The homogeneity analysis failed to reject the null hypothesis of homogeneity; therefore, the variability across effect sizes does not exceed what would be expected given errors in sampling, Q(14) = 7.73, *p* > .05. These statistics can be found in Tables 15 and 16.

Objective Bulimic Episodes

The results of the meta-analysis demonstrate support for the convergent validity of the assessment of OBEs using the EDE and EDE-Q. With regard to the meta-analysis using Cohen's d, effect sizes for the individual studies ranged from -0.58 to 0.26 with a mean effect size of -0.12 (95% CI: -0.21 to -0.03). The homogeneity analysis did reject the null hypothesis of homogeneity which indicates that there are significant differences in the mean effect sizes across studies, Q(12) = 48.09, $p < .001$. Results from the heterogeneity analysis indicate that only Q_W was significant ($Q_B(6) = 9.28$, $p > .05$; $Q_w(7) = 38.80$, $p < .001$) suggesting that the variance among mean effect sizes is due to within-group variability or error. With regard to the meta-analysis using correlation coefficients, the effect sizes for the individual studies ranged from .20 to .92 with a mean effect size of .64 (95% CI: .58 - .70). The homogeneity analysis rejected the null hypothesis of homogeneity which indicates that there are significant differences in the mean effect sizes across studies Q(13) = 58.40, $p < .001$. Results from the heterogeneity analysis indicate that both Q_B and Q_w were significant ($Q_B(5) = 33.52$, $p < .001$; $Q_w(8) = 25.27$, $p <.01$) suggesting that the between-group variability is not sufficient to explain the variance among mean effect sizes. These statistics can be found in Tables 17 and 18.

Subjective Bulimic Episodes

The results of the meta-analysis demonstrate moderate support for the convergent validity of the assessment of SBEs using the EDE and EDE-Q. With regard to the meta-analysis using Cohen's d, effect sizes for the individual studies ranged from -0.57 to 0.17 with a mean effect size of -0.21 (95% CI: -0.33 to -0.09). The homogeneity analysis failed to reject the null hypothesis of homogeneity which indicates that there are not differences in the mean effect sizes across studies, Q(7) = 11.78, *p* > .05. With regard to the meta-analysis using correlation coefficients, the effect sizes for the individual studies ranged from -.09 to .78 with a mean effect size of .52 (95% CI: .43 - .60). The homogeneity analysis did reject the null hypothesis of homogeneity which indicates that there are significant differences in the mean effect sizes across studies Q(7) = 56.37, *p* < .001. Results from the heterogeneity analysis indicate that only Q_B was significant (Q_B(4) = 54.45, *p* < .001; Q_w(3) = 1.92, *p* > .05) suggesting that the between-group variability is sufficient to explain the variance among mean effect sizes. The correlation between the EDE and EDE-Q appears significantly lower for the BED sample (r=-.07) than for the other samples. These statistics can be found in Tables 17 and 18.

Self-Induced Vomiting

The results of the meta-analysis demonstrate strong support for the convergent validity of the assessment of self-induced vomiting using the EDE and EDE-Q. With regard to the meta-analysis using correlation coefficients, the effect sizes for the individual studies ranged from .72 to .99 with a mean effect size of .89 (95% CI: .81 - .98). The homogeneity analysis failed to reject the null hypothesis of homogeneity which indicates that there are not differences in the mean effect sizes across studies, Q(7) = 2.38, *p* > .05. Only two studies reported the means and standard deviations of the frequency of self-induced vomiting as assessed by the EDE and EDE-Q (Carter et al., 2001; Wolk et al., 2005). Due to the limited amount of data, a meta-analysis using Cohen’s d is inappropriate. These statistics can be found in Tables 17 and 18.

Laxative Misuse

The results of the meta-analysis demonstrate strong support for the convergent validity of the assessment of laxative misuse using the EDE and EDE-Q. With regard to the meta-analysis using correlation coefficients, the effect sizes for the individual studies ranged from .60 to .99 with a mean effect size of .84 (95% CI: .75 - .93). The homogeneity analysis did reject the null hypothesis of homogeneity which indicates that there are significant differences in the mean effect sizes across studies Q(5) = 12.35, $p < .05$. Results from the heterogeneity analysis indicate that only Q_B was significant ($Q_B(4) = 12.04$, $p < .05$; $Q_w(1) = 0.30$, $p > .05$) suggesting that the between-group variability is sufficient to explain the variance among mean effect sizes. In this case, the correlations between the EDE and EDE-Q appear lower for the AN and community-based samples than for the participants with BN, the combined AN and BN sample, and the participants with primary substance use. As is the case for self-induced vomiting, only two studies reported the means and standard deviations of the frequency of laxative misuse as assessed by the EDE and EDE-Q (Carter et al., 2001; Wolk et al., 2005). Due to the limited amount of data, a meta-analysis using Cohen's d would be inappropriate at this time. These statistics can be found in Tables 17 and 18.

Other Compensatory Behaviors

Only two studies reported data on compensatory behaviors other than self-induced vomiting and laxative misuse (Carter et al., 2001; Wolk et al., 2005). Of these, one compared the frequency of diuretic misuse reported on the EDE and EDE-Q and the other compared the frequency of excessive exercise reported on the two instruments (Wolk et al., 2005). The dearth of research on compensatory behaviors other than self-induced vomiting and laxative misuse precludes the use of meta-analysis to examine the convergent validity of the EDE and EDE-Q with regard to these constructs.

Discussion

The data from the meta-analyses provide support for the convergent validity of the EDE and EDE-Q. The results from the meta-analyses using correlation coefficients indicate that there is a strong positive relationship between EDE and EDE-Q scores for all four subscales, OBEs, SBEs, self-induced vomiting, and laxative misuse. The results of the homogeneity analyses indicate that these correlations do not vary among different samples for the four subscales or self-induced vomiting, but that they do vary for the assessment of OBEs, SBEs, and laxative misuse. The results from the meta-analysis using Cohen's d show that there are small to moderate defect sizes for the differences between the EDE and EDE-Q for the Restraint subscale, Weight Concern subscale, OBEs, and SBEs and moderate to large effect sizes for the differences between the EDE and EDE-Q for the Eating Concern and Shape Concern subscales. The results of the homogeneity analysis indicate that the size of the effect varies among different samples for the Eating Concern, Shape Concern, and Weight Concern subscales as well as for the assessment of OBEs. These findings have important clinical implications for the assessment of eating disorder symptoms.

With regard to the four subscales of the EDE and EDE-Q, the results of the meta-analysis indicate that participants who score high on one of the two instruments also score high on the other. However, these results also demonstrate that participants score consistently higher on the EDE-Q than on the EDE. These results seem to indicate that participants either over-report their symptoms on the EDE-Q or under-report their symptoms on the EDE. Researchers have suggested that people may under-report their symptoms during interviews because of feelings of shame elicited by the loss of anonymity during face-to-face interviews. This hypothesis has been supported by the finding that EDE-Q scores were more similar to EDE scores when the EDE was conducted via telephone rather than in person (Keel, Crow, Davis, & Mitchell, 2002). However, other researchers have purported the opposite: that respondents may under-report their symptoms during interviews because their symptoms do not cause them distress and are not perceived as problematic. Therefore, these symptoms are not reported during interviews because the participants do not want treatment. There is empirical support for this theory as one study found that women who endorsed purging behavior on the EDE-Q and subsequently denied this behavior during the EDE were significantly less functionally impaired and distressed than women who endorsed purging behavior on both instruments (Mond, Hay, Rodgers, & Owen, 2007). Finally, research from the Minnesota Multiphasic Personality Inventory-2 (MMPI-2; Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989), a self-report questionnaire, has demonstrated that demoralization or distress can elevate scores on the Clinical Scales and the Infrequency Scale (F) over and above those typically observed in psychiatric samples (Arbisi & Ben-Porath, 1995; Sellbom, Ben-Porath, McNulty, Arbisi, & Graham, 2006). Although one might argue that distress would also inflate participants’ scores on structured interviews, structured interviews such as the EDE provide anchors that assessors can use to make ratings, thereby decreasing the bias caused by participant distress (Wilson, 1993). Although scores were higher on the EDE-Q for all subscales, it is notable that the difference between the two measures was greater for the Eating Concern and Shape Concern subscales. It is possible that the variable responsible for higher scores on the EDE-Q (e.g., shame, distress, etc.) is more associated with the Eating Concern and Shape Concern subscales than with the Restraint or Weight Concern scales; however, there are no data to support this assertion currently.

In addition to the finding that participants scored higher on the EDE-Q subscales than the EDE subscales, the results of the meta-analysis indicate that the size of these differences varies among various samples. One interesting finding from this meta-analysis is that a smaller difference between the EDE and EDE-Q was found for patients with AN than patients with BED. In fact, the size of the effect for the AN samples approximated the size of the effect for the community samples for all subscales except Shape Concern. These findings may be due to the ego-syntonic nature of AN, which could decrease both the level of shame and distress these participants feel. Regardless of whether participants over-report their symptoms on the EDE-Q or under-report their symptoms on the EDE, the data from this meta-analysis indicate that there are small- to medium-sized effects for the differences between the two instruments with regard to the severity of symptoms reported with participants consistently scoring higher on the EDE-Q than the EDE.

With regard to the assessment of eating disorder behaviors, the correlations between the EDE and EDE-Q for compensatory behaviors ranged from .87 to .90

whereas the correlation between the two instruments for OBEs and SBEs ranged from .55 to .64. These data suggest that there is a stronger relationship between the two instruments with regard to the assessment of compensatory behaviors than for the assessment of binge eating. Although there were small effect sizes for the differences between the EDE and EDE-Q with regard to the assessment of OBEs and SBEs, these data do not necessarily support the convergent validity of the EDE and EDE-Q for the assessment of binge eating. As stated previously, the correlations between the two instruments for the assessment of binge eating were lower than for the assessment of compensatory behaviors as well as the four subscales. Additionally, the range of effect sizes was large, ranging from -.26 to .58 for OBEs and -.17 to .57 for SBEs. There were significant differences between the size of the effects amongst the various studies, which was explained by within-group differences or error. Finally, it should be noted that participants did not consistently score higher on one instrument than the other in contrast to the pattern observed for the four subscales. These data indicate that there are inconsistencies between the EDE and EDE-Q for the assessment of binge eating that may not be due to the method of administration.

It has been suggested that the inconsistencies between self-report questionnaires and interview-based assessments may be due to the vague, ambiguous definition of binge eating and that giving participants more information regarding the definitions of binge eating may increase the accuracy with which participants report these behaviors on self-report questionnaires such as the EDE-Q (Wilfley et al., 1997). Several studies have found that administering the EDE-Q after the EDE results in higher correspondence between the two instruments than administering the EDE after the EDE-Q (Passi et al., 2003; Carter et al., 2001). Because participants who completed the EDE-Q after the EDE would have received more comprehensive explanations of “binge eating” and “loss of control,” these data support the hypothesis that giving respondents additional information regarding the definitions of key terminology may enhance the correspondence between the EDE and EDE-Q. Based on these data, Goldfein et al. (2005) created the Eating Disorder Examination–Questionnaire with Instructions (EDE-Q-I) which provides participants with definitions for a “large amount of food” and “loss of control.” The limited amount of research on the EDE-Q-I has found that the EDE-Q-I has higher convergent validity than the original EDE-Q in assessing OBE frequency in participants with BED (Celio, Wilfley, Crow, Mitchell, & Walsh, 2004; Goldfein et al., 2005).

In sum, the results from these meta-analyses generally support the convergent validity of the EDE and EDE-Q. The support for the convergent validity of the two instruments is strongest for the Restraint, Eating Concern, Shape Concern, and Weight Concern subscales as well as for the assessment of self-induced vomiting and laxative misuse. These data provide more limited support for the assessment of OBEs and SBEs. These results suggest that both instruments can be used to validly assess constructs associated with eating disorder symptoms. However, these data do not support using the two instruments interchangeably as differences in symptom levels due to the differences in administration may be erroneously attributed to other factors (e.g., time, treatment condition).

This study has several strengths. First, this is the only study to examine the convergent validity of the EDE and EDE-Q using meta-analysis. Given the small sample sizes used in most previous research in this area, meta-analysis is essential to understanding the generalizability of the results. Second, both meta-analysis using correlation coefficients and Cohen's d were used which allows for interpretation of both the relationship between the two instruments and the size of the difference between the two instruments. Third, individual meta-analyses were conducted to examine the convergent validity between the EDE and EDE-Q for the assessment of Restraint, Eating Concern, Shape Concern, Weight Concern, OBEs, SBEs, self-induced vomiting, and laxative misuse. Finally, a homogeneity analysis was used to examine whether the relationship between the EDE and EDE-Q is consistent across different types of samples.

This study also had several limitations. Most notable is the lack of research on the relationship between the EDE and EDE-Q for participants with BN and EDNOS as well as for the assessment of compensatory behaviors. Additionally, this study does not provide information regarding the convergence of individual symptom profiles between the EDE and EDE-Q. Finally, the results from the meta-analysis can only be used to describe the relationship between the two instruments. These data do not provide evidence with regard to the cause of the differences between the EDE and EDE-Q. Thus, suggestions for improving the correspondence between the two instruments can only be made pending additional research.

These findings suggest several directions for future research. First, additional research is needed on the convergent validity of the EDE and EDE-Q for patients with

BN and EDNOS and for the assessment of compensatory behaviors. Second, researchers should continue to explore whether self-report questionnaires over-estimate symptom levels or whether interview-based assessments under-estimate symptom levels. Third, it would be interesting to examine whether individual symptom profiles differ between the EDE and EDE-Q. Finally, additional research is needed to examine the inconsistencies in the assessment of binge eating.

Study 2: Convergent and Discriminant Validity of the EDE with Regard to the Assessment of Binge Eating

Literature Review

The Eating Disorder Examination (EDE; Fairburn & Cooper, 1993) is commonly referred to as the “gold standard” in the assessment of eating disorder symptoms and research has provided strong evidence for the validity of the EDE with regard to the assessment of eating disorder cognitions and compensatory behaviors. However, there is limited support for the validity of the EDE with regard to the assessment of binge eating.

For example, the differences between the EDE and EDE-Q for the assessment of cognitive symptoms of eating disorders are in a consistent, predictable direction regardless of the sample. These results suggest that the instruments are assessing similar constructs and that the differences between the subscale scores reported on the two instruments are likely due to the fact that one is a self-report questionnaire whereas the other is a semi-structured interview. There are also differences between the EDE and EDE-Q with regard to the assessment of binge eating. However, in contrast to the assessment of cognitive symptoms, the differences between the EDE and EDE-Q for the assessment of binge eating are inconsistent. In other words, some studies found that participants report more episodes of binge eating on the EDE whereas others found that participants report more episodes on binge eating on the EDE-Q. These inconsistencies suggest that the differences between the two instruments may not be due to the method of administration; rather, there may be a problem inherent in the operationalization of binge eating. In addition to the inconsistencies between the EDE and EDE-Q, and perhaps more disconcerting, is the observation that some participants who explicitly deny binge eating during the EDE or the Structured Clinical Interview for the DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 1995) endorse subsequent binge eating when using Ecological Momentary Assessment (EMA; Greeno, Wing, & Shiffman, 2000; le Grange, Gorin, Catley, & Stone, 2001).

To further examine the validity of the EDE with regard to the assessment of binge eating, three studies have assessed the convergent validity of the binge eating section of the EDE through comparison to daily food records (Farchaus Stein & Corte, 2003; Loeb et al., 1994; Rosen et al., 1990). A complete summary of these findings can be found in Table 19. In the first of these studies (Rosen et al., 1990), a community sample of 106 women recorded their daily food and drink consumption for 7 days, and were asked to indicate whether they believed each episode of eating was a binge episode. At the end of the 7-day monitoring period, each participant was assessed using the EDE. A second study examined the convergent validity of the EDE’s overeating section for both a 7-day and 28-day time period in a sample of women seeking treatment for BN (Loeb et al., 1994). Prior to entering treatment, 82 women kept daily records of binge eating and self-induced vomiting for 7 days. After 7 days, they completed an EDE that assessed binge eating for both the past 7 days and the past 28 days. Participants in this study continued keeping daily records of binge eating and purging during a 20-session weekly therapy. At the end of treatment, participants were assessed again using the EDE. The end-of-treatment EDE was then compared to the daily records of binge eating and purging for both 7-day and 28-day time periods. Of the 82 original participants, 50-69 were used in the analysis of convergent validity due to missing data. The purpose of the third study was not to test the convergent validity of the EDE, but to test the feasibility of using EMA to assess disordered eating behavior (Farchaus Stein et al., 2003). Sixteen women diagnosed with either BN or subthreshold AN binge/purge subtype kept daily records of binge eating and purging behaviors for 28 days using handheld computers. Participants also completed an EDE after the 28 days were completed. Of the original 16 participants, only data from 13 were used in the analyses.

These three studies all found a significant positive relationship between the frequency of binge episodes reported on the EDE and the daily food records, with correlations ranging from .56 to .93. However, the correlations in the Loeb et al. study (rs = .80 to .93) were stronger than the in Farchaus Stein et al. study (*r* = .60) or the Rosen et al. study (*r* = .56). Only one study reported the means and standard deviations of the frequency of binge eating reported on the EDE and in daily food records (Farchaus Stein et al., 2003). In this study, participants reported significantly higher rates of binge eating on the EDE (M = 14.23, SD = 18.77) than when using the EMA methodology (M = 7.62, SD = 11.51) (*p* <.05; Cohen's d =.42).

In comparison, the three studies also examined the convergent validity of the EDE's assessment of compensatory behaviors using daily recordings (Farchaus Stein et al., 2003; Loeb et al., 1994; Rosen et al., 1990). All three studies found significant correlations between the frequency of vomiting episodes reported on the EDE and the frequency reported on daily recordings. These correlations ranged from .75 to .99, with the highest correlations found in the posttreatment phase of the Loeb et al. study. Only one study assessed the convergent validity of the EDE to assess laxative use, diuretic use, or excessive exercise (Farchaus Stein et al., 2003). There were significant correlations ranging from .62 to 1.00 between the EDE and EMA for these behaviors. As was the case for binge eating, the Farchaus Stein et al. study was the only one to report means and standard deviations for the frequency of compensatory behaviors reported on the EDE and daily logs. There were no significant differences between the EDE and daily recordings for self-induced vomiting, laxative use, or diuretic use with Cohen's d ranging from .13 to .24. Participants did report significantly higher frequencies of excessive exercise on the EDE (Cohen's d = .78).

Limitations of Research on the Convergent validity of the EDE and Daily Food Records

Although the convergent validity of the EDE's assessment of binge eating has been examined, there are important limitations to these studies. First, there is an overall dearth of research in this area, with only three studies examining the validity of the EDE with regard to the assessment of binge eating. This is surprising given the importance of the assessment of binge eating to the diagnosis of BN and BED.

Second, only two of the three studies examined the convergent validity of the EDE and food logs in clinical samples (Loeb et al., 1994; Farchaus Stein et al., 2003); the third study used a community sample (Rosen et al., 1990). One of the two studies that used eating disorder samples conducted most of the analyses on the participants after they had completed the active phase of a treatment study (Loeb et al., 1994). It is important to note that there may have been participants in both the community sample (Rosen et al., 1990) and the posttreatment sample (Loeb et al., 1994) who were abstinent from bingeing. If participants were abstinent from binge eating and therefore reported zero binge episodes on both the EDE and food logs, the correlations between the EDE and food records would be artificially inflated. However, neither the Rosen et al. (1990) study nor the Loeb et al. (1994) study examined whether the correlations between the EDE and food logs remained the same when participants abstinent from binge eating were removed from the dataset. Finally, the one clinical study that used a baseline eating disorder sample was very small (n = 16).

Third, only one study reported means and standard deviations for the frequency of binge eating reported on the EDE and in daily food records. The other two studies only reported correlations. Significant correlations between two variables can exist even when there are significant mean differences between the two variables. Because the EDE is used diagnostically and the diagnoses for BN and BED are based primarily on the frequency of binge episodes, significant mean differences between the EDE and daily food records could result in these instruments arriving at different diagnostic conclusions. Fourth, no studies have assessed the sensitivity and specificity of the EDE. Because the EDE is often used as a diagnostic instrument, it is important to know the extent to which the EDE assigns people to the correct diagnostic categories

A fifth limitation is that, although the EDE can be used to assess binge eating and purging frequency for up to the past 6 months, no study has assessed the validity of the EDE for this time period. Two studies have assessed the validity of the EDE's overeating section using a 28-day time period (Farchaus Stein et al., 2003; Loeb et al., 1994) and one study assessed the validity of EDE's assessment of binge eating for a 7-day time period (Rosen et al., 1990). The majority of questions on the EDE assess eating disorder symptomatology during the past 28 days. However, as stated before, the EDE is also used to determine diagnostic status and the diagnoses of BN and BED are based in part on the frequency of binge eating during the past 3 and 6 months respectively. Unfortunately, no study has assessed the validity of the EDE's assessment of binge eating for either of these time periods.

Sixth, none of the validity studies of the EDE indicated whether the researchers differentiated between OBE's and SBE's in their analyses. Assuming that "binge eating" refers to OBE's, there is no published research on the concurrent validity of the EDE to assess SBE's. Consequently, there has been no research that has studied the ability of the EDE to differentiate between OBE's and SBE's. This is important because diagnostic status depends on the frequency of OBEs, not SBEs. However, some research has found that the presence of loss of control is more important than the quantity of food consumed in laypersons' definitions of a "binge" (Beglin & Fairburn, 1992). Research has found that SBE's are significantly correlated with indicators of eating disorder symptoms such as self-induced vomiting, diuretic misuse, overevaluation of shape and weight, and drive for thinness. Additionally, SBEs may be as strong a predictor of eating disorder pathology as are OBEs (Latner, Hildebrandt, Rosewall, Chisholm, & Hayashi, 2007). Thus, it may be difficult for participants to distinguish between OBEs and SBEs, but given the importance of the difference between the two types of episodes with regard to diagnostic status, it is important for the EDE to distinguish between OBEs and SBEs.

Finally, the validity studies of the EDE have primarily used women who were both binge eating and purging, which may limit the generalizability of the results to participants who have other disordered eating symptoms (e.g., only binge eating). The restricted range of disordered eating in these study's samples is important for another reason as well. Several studies have found that instruments that measure disordered eating behaviors, including the EDE, appear to have better convergent validity for the assessment of self-induced vomiting than binge eating. This suggests that binge eating, whether it is assessed by the EDE or an alternative measure, may be a more difficult construct to assess than self-induced vomiting. Women who both binge and purge often engage in these behaviors consecutively. Thus, validity studies of the EDE that only include women who binge and purge may overestimate the concurrent validity of the EDE in assessing binge eating because the participants may be using their recall of vomiting episodes to help them recall the frequency of their binge eating episodes.

The purpose of this study was to examine the convergent validity of the EDE's assessment of binge eating, addressing the limitations described above. First, this study examined the validity of the EDE and daily food records in a sample of adults with BED. Participants in this study did not regularly use compensatory behaviors and thus would not be able to use their recall of compensatory behaviors to enhance their recall of binge eating. Second, because a posttreatment sample was used, analyses were conducted on the full sample as well as a partial sample in which participants who denied binge eating on both the EDE and DFRs were removed. This insured that the relationship between the EDE and daily food records was not artificially inflated due to abstinence of symptoms. Third, analyses were conducted for a 3-month time period, which better approximates the time period needed to make diagnoses of eating disorders. Fourth, this study also differentiated between OBEs and SBEs and ran separate analyses for the two types of eating episodes. Fifth, separate convergent validity analyses were conducted for the assessment of binge days and binge episodes. They were then compared to determine whether one demonstrated greater convergent validity than the other. Sixth, the validity of the EDE was examined using Pearson product-moment correlations, mean differences, effect sizes, and analyses of sensitivity and specificity. Seventh, an analysis of discriminant validity was conducted to determine whether the EDE is able to discriminate binge eating from similar constructs: namely depression, body dissatisfaction, and self-esteem. Finally, an analysis of contamination was conducted to determine whether these same constructs contaminate the assessment of binge eating using the EDE more than the DFRs.

Method

Participants

The sample included 26 adult women and 8 adult men participating in a treatment outcome study for BED (Peterson, Mitchell, Crow, Crosby, & Wonderlich, 2009) who completed daily food records and an end-of-treatment EDE. The age range for participants in this study was 37-63 years with a mean age of 51 years. All but one of the participants identified themselves as Caucasian (97%) with one participant identifying as African American. The majority of the participants indicated that they were full-time wage earners (59%), 5 participants identified as part-time wage earners (15%), 3 identified as homemakers (9%), 1 participant was unemployed (3%), and 5 participants identified themselves as “other” (e.g., retired, disabled, etc.).

At baseline, all participants met criteria for Binge Eating Disorder as defined by the following criteria: binge eating occurring on average twice per week for the past six months, overevaluation of shape and weight, and a BMI $\geq$ 25. The BMI of participants at baseline ranged from 24.87 to 62.02 with a mean BMI of 39.41 whereas at posttreatment, the participants’ BMIs ranged from 24.02 to 63.74 with a mean BMI of 39.24. There were no significant differences between participants’ BMIs at baseline and posttreatment.

Procedure

Participants who met criteria for the study were randomized to one of three treatment groups or to a waitlist control group. The three treatment groups were identical except for the amount of therapist contact. Each treatment group met 15 times for 80 minutes over a 20-week period, once weekly for the first 10 weeks and biweekly for the remaining 10 weeks. In the therapist-led group, a doctoral-level therapist provided the participants with 40 minutes of psychoeducation and then led a discussion for 40 minutes. In the therapist-assisted group, participants watched a video of a doctoral-level therapist providing psychoeducation and then a therapist led a 40-minute discussion in person. In the self-help group, participants watched the same video as in the therapist-assisted group and then the participants took turns leading the 40-minute discussion. Participants randomized to the waitlist group took part in the therapist-led group at the end of the 20-week waiting period.

All participants, regardless of treatment group, were asked to complete food records each day during the treatment phase of the study and to bring the food records to their treatment group each week. The food logs were collected at the beginning of each therapy session by a research assistant, who copied these forms and then returned them to the participants for use in the treatment sessions. Eating disorder symptoms, including frequency of binge eating, were assessed at baseline and posttreatment using the EDE. All assessors were blind to the participants' treatment group. Participants also completed a battery of self-report questionnaires at baseline and posttreatment.

Measures

Eating Disorder Examination. The Eating Disorder Examination (EDE; Fairburn & Cooper, 1993) is a semi-structured interview that assesses eating disordered behaviors and cognitions during the past 6 months, giving the most attention to the past 28 days. The EDE assesses the number of objective and subjective binge days and total number of objective and subjective binge episodes for each of the past 6 months. The EDE allows the assessor to help guide the participant in identifying binge episodes and discriminating between OBEs and SBEs. The reliability and validity research was reviewed in Study 1. The EDE was used in this study to assess the frequency of OBE days and OBE episodes for the past 6 months. The frequency of SBE days and SBE episodes was only calculated for the past 28 days.

Daily food records. During the 20-week treatment phase of the study, participants were asked to keep daily food records on sheets provided by the researchers. Every time the participants ate, they were to write in the type of food consumed, the amount consumed, the time and place it was consumed, and the context in which it was consumed. Participants were instructed to identify episodes of eating as "binges" when "[they] consumed an excessive amount, and/or you experienced a sense of loss of control." The food records are blank sheets of paper with columns for time/place, type/amount of food consumed, context, and whether it was a binge.

Two experienced assessors were who blind to *** individually reviewed the daily food records and coded each episode of eating as an OBE, SBE, or normative eating based on the quantity of food consumed and whether loss of control was present. The assessors calculated the number of OBE days, OBE episodes, SBE days, and SBE episodes for each participant included in the study. The assessors determined whether each eating episode was objectively large using the criteria outlined in the EDE. Loss of control was based on whether the participant identified the eating episode as a "binge." Few OOEs (objectively large episodes without loss of control) were reported; thus, the assessors assumed that when participants indicated an episode of eating was a "binge," it included loss of control. This is also supported by data indicating that loss of control is more important to a layperson’s definition of binge eating than is the quantity of food consumed (Beglin & Fairburn, 1992).

One of the assessors was the author of the study, who has had training and 6+ years experience administering the EDE. The other assessor was originally trained by one of the developers of the EDE, C. Fairburn, Ph.D., and has had 15+ years administering the EDE. Twenty percent of the ratings were compared between raters to assess interrater agreement (see Preliminary Analyses section below).

Inventory for Depressive Symptomatology-Self-Report. The Inventory for Depressive Symptomatology-Self-Report (IDS-SR; Rush, Giles, Schlesser, Fulton, Weissenburger, & Burns, 1986) is a self-report questionnaire that assesses symptoms associated with Major Depressive Disorder. Respondents are asked to rate the severity of 28 symptoms on a 4-point Likert scale ranging from 0 (no symptoms) to 3 (severe symptoms). The IDS-SR has demonstrated good test-retest reliability (α = .85) and is significantly correlated with both the Hamilton Rating Scale for Depression (r = .67) and the Beck Depression Inventory (r = .78). The internal consistency for the current sample was α=.88.

Rosenberg Self-Esteem Scale. The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) is a self-report measure of general self esteem. Participants are asked to assess the extent to which 10 statements are true for themselves. Participants rate statements such as such as "I have a positive attitude about myself" and “I feel that I do not have much to be proud of” on a 7-point Likert scale that ranges from “strongly agree” to “strongly disagree.” The internal reliability for the Rosenberg Self-Esteem Scale has been found to be approximately .75 (Rosenberg, 1965). The internal consistency for the current sample was α=.93.

Body Shape Questionnaire. The Body Shape Questionnaire (BSQ; Cooper et al., 1987) is a self-report questionnaire that assesses the extent to which individuals are concerned with their body shape or figure. The BSQ asks participants to rate their concern with their shape on a 6-point Likert scale, ranging from 1 (Never) to 6 (Always). Sample items include “Have you felt so bad about your shape that you have cried?” and “Have you avoided wearing clothes which make you particularly aware of the shape of your body?” The BSQ has demonstrated good concurrent validity with the Eating Attitudes Test (EAT; Garner & Garfinkel, 1979) and the Body Dissatisfaction subscale of the Eating Disorder Inventory (EDI; Garner, Olmstead, & Polivy, 1983). Additionally, the BSQ is able to differentiate between patients and non-patients, such that women with BN scored significantly higher than a community sample. Finally, the BSQ has demonstrated good test-retest reliability (α = .88) (Rosen, Jones, Ramirez, & Waxman, 1996). The internal consistency for the current sample was α=.97.

Data Analysis Plan

Comparison of the EDE and Daily Food Records. To examine the convergent validity of the EDE and Daily Food Records, three types of analyses were conducted. First, pearson product-moment correlations were conducted between the frequency of OBE days reported on the EDE and the frequency of OBE days reported on the Daily Food Records. Similar correlations were calculated for OBE episodes, SBE days, SBE episodes, Total days (OBE days + SBE days), and Total episodes (OBE episodes + SBE episodes). Analyses comparing the frequency of OBEs on the EDE and Daily Food Records were conducted for the past 3 months whereas analyses comparing the frequency of SBE days, SBE episodes, Total days, and Total episodes were conducted for the past 28 days only. See Figure 1 for a graphical representation of these analyses. Second, paired-sample t-tests will be conducted to examine whether there are significant differences between the frequency of OBE days reported on the EDE and the frequency of OBE days recorded in the Daily Food Records. Similar paired-sample t-tests were conducted for OBE episodes, SBE days, SBE episodes, Total days, and Total episodes. Finally, effect sizes were calculated to examine the effect size of the difference between OBE days reported on the EDE and the frequency of OBE days recorded in the Daily Food Records. Similar effect sizes were calculated for OBE episodes, SBE days, SBE episodes, Total days, and Total episodes.

Exclusion of zero-pairs. As stated above, past research on the convergence between the EDE and Daily Food Records with regard to the assessment of binge eating has not accounted for participants who were not binge eating at the time of the assessment. Inclusion of such participants has the potential to artificially inflate the convergence of the two instruments. To test whether the convergent validity of the EDE and Daily Food Records is supported for those participants who have not reached abstinence of symptoms during treatment, the analyses described above were re-run excluding all participants who scored “0” on both the food logs and the EDE. The exclusion of such “zero-pairs” has been used previously in the alcohol dependence research to account for artificial inflation of correlations (Sobell et al., 1986). Specifically, if a participant did not report any OBE episodes on the EDE or in the daily food records in Month 1, that person was taken out of the analyses relevant to OBE episodes in Month 1. Likewise, if a participant did not report any SBE episodes on the EDE or in the daily food records in Month 1, that person would be taken out of this portion of the data analysis and so on for all pairs of analyses. However, if a participant denied OBE episodes for Month 1 during the EDE, but reported OBE episodes for Month 1 in their daily food records or vice versa, that person was still included in this portion of the analyses. Likewise, if a participant denied SBE episodes during the EDE, but reported SBE episodes in their daily food records or vice versa, that person was still included in this portion of the analyses and so on for all pairs of analyses.

Comparison of days and episodes. The EDE requires respondents to report the total number of eating disorder episodes (e.g., OBE episodes) they had during the past 28 days as well as the number of days on which these episodes occurred (OBE days). The rationale for this is that, because some respondents may have more than one episode per day, the frequency of OBE episodes may not be equivalent to the frequency of OBE days. Currently there is no research on the use of days versus episodes. Within the eating disorder literature, the frequency of days and the frequency of episodes are often used interchangeably. In fact, in one study on the convergent validity of the EDE, the frequency of vomiting *episodes* reported on the EDE was correlated with the frequency of vomiting *days* reported on the EDE-Q (Binford et al., 2005). To determine whether there is greater consistency between the EDE and Daily Food Records for days or episodes, the correlation between the frequency of OBE days reported on the EDE and Daily Food Records was compared to the correlation between the frequency of OBE episodes on the EDE and Daily Food Records. Similar comparisons were made for SBE days and episodes as well as Total days and episodes. See Figure 2 for a graphical representation of these analyses. Prior to testing the null hypothesis that $p_1 – p_2 = 0$, r was transformed using Fisher's transformation to correct for non-normality. Once r was transformed to z, the following calculation was used to test the null hypothesis: (z1 – z2) / √ ((1/(N1 – 3)) + (1/(N2 – 3))). The null hypothesis was supported if this statistic was less than 1.96 (for a two-tailed test at α= 0.05).

Comparison of OBEs, SBEs, and Total (OBEs + SBEs) for Days and Episodes Respectively. Although a handful of researchers have reported on the psychometric properties of the EDE in assessing both OBEs and SBEs, there has been no statistical comparison of these data. Additionally, there has been no research comparing the psychometric properties of individual reports of OBEs or SBEs to a combined report of OBEs + SBES (Total).

I hypothesized that the correlation between the EDE and Daily Food Records would be stronger for the assessment of OBE days than SBE days. I also hypothesized that the correlation between the EDE and Daily Food Records would be stronger for the assessment of OBE days than Total (OBE + SBE) days, but that the correlation between the EDE and Daily Food Records would be stronger for the assessment of Total (OBE + SBE) days than for SBE days.

Likewise, I hypothesized that the correlation between the EDE and Daily Food Records would be stronger for the assessment of OBE episodes than SBE episodes. Additionally, I hypothesized that the correlation between the EDE and Daily Food Records would be stronger for the assessment of OBE episodes than Total (OBE + SBE) episodes, but that the correlation between the EDE and Daily Food Records would be stronger for the assessment of Total (OBE + SBE) episodes than SBE episodes.

As stated above, Pearson product-moment correlations were conducted between the frequency of OBE days reported on the EDE and the frequency of OBE days reported on the Daily Food Records. Similar correlations were calculated for OBE episodes, SBE days, SBE episodes, Total days, and Total episodes. See Figure 1 for a graphical representation of these analyses.

These correlations were then compared as follows. First, the correlation between the EDE and Daily Food Records for the assessment of OBE days was compared to the correlation between the EDE and Daily Food Records for the assessment of SBE days. Second, the correlation between the EDE and Daily Food Records for the assessment of OBE days was compared to the correlation between the EDE and Daily Food Records for the assessment of Total days. Third, the correlation between the EDE and Daily Food Records for the assessment of SBE days was compared to the correlation between the EDE and Daily Food Records for the assessment of Total days. See Figure 3 for a graphical representation of these analyses. Fourth, the correlation between the EDE and Daily Food Records for the assessment of OBE episodes was compared to the correlation between the EDE and Daily Food Records for the assessment of SBE episodes. Fifth, the correlation between the EDE and Daily Food Records for the assessment of OBE episodes was compared to the correlation between the EDE and Daily Food Records for the assessment of Total episodes. Sixth, the correlation between the EDE and Daily Food Records for the assessment of SBE episodes was compared to the correlation between the EDE and Daily Food Records for the assessment of Total episodes. See Figure 4 for a graphical representation of these analyses.

Individual Differences between the EDE and Daily Food Records. Along with correlations, the frequency of binge eating reported on the EDE and Daily Food Records was compared using paired sample t-tests. However, mean scores obscure the fact that some respondents may report a higher frequency of binge eating on the EDE whereas others may report a higher frequency on Daily Food Records. Thus, analyses that compare means do not provide information about individual differences in scores. This limitation is particularly important to determining the correspondence between the EDE and Daily Food Records. For example, if there is no significant difference between the frequency of OBE days reported on the EDE and the frequency of OBE days reported on Daily Food Records, this could either mean that respondents reported similar frequencies of this behavior on both instruments or that some respondents reported a higher frequency on the EDE and others reported a higher frequency on Daily Food Records. The former would support the correspondence of the EDE and Daily Food Records whereas the latter would not.

To examine individual differences between the frequency of binge eating reported on the EDE and in Daily Food Records, the difference between the EDE and Daily Food

Records was calculated for each of the following: OBE days, OBE episodes, SBE days, SBE episodes, Total days, and Total episodes using the following equation: Difference = EDE frequency – Daily Food Record frequency. Thus, positive values reflect higher frequencies on the EDE whereas negative values reflect higher frequencies on the Daily Food Records. Frequency tables of difference scores were calculated for each of the following: OBE days, OBE episodes, SBE days, SBE episodes, Total days, and Total episodes.

Analysis of Sensitivity, Specificity, Positive Predictive Value, and Negative Predictive Value. Sensitivity and specificity were calculated using equations based on the number of True Positives, True Negatives, False Positives, and False Negatives. A True Positive occurs when a person *does* have a disorder and the instrument correctly identifies that the person *does* have that disorder. A True Negative occurs when a person *does not* have a disorder and the instrument correctly identifies that person as *not* having the disorder. A False Positive occurs when a person *does not* have the disorder, but the instrument incorrectly identifies that the person *does* have the disorder. Finally, a False Negative occurs when a person *does* have the disorder, but the instrument incorrectly identifies that person as *not* having the disorder. Sensitivity is calculated by dividing the number of True Positives by the sum of True Positives and False Negatives. In other words, Sensitivity is the probability that, if the person has the disorder, the instrument will correctly identify the person as having the disorder. Specificity is calculated by dividing the number of True Negatives by the sum of True Negatives and False Positives.

Specificity is the probability that, if a person does not have the disorder, the instrument will correctly identify that person as not having the disorder.

Positive Predictive Value (PPV) is the probability that, if the instrument identifies the person as having the disorder, the person does in fact have the disorder. It is calculated by dividing the number of True Positives by the sum of True Positives and False Positives. Negative Predictive Value (NPV) is the probability that, if the instrument identifies the person as not having the disorder, the person does not actually have the disorder. It is calculated by dividing the number of True Negatives by the sum of True Negatives and False Negatives.

In this study, the diagnostic status of each participant was determined twice, first using the DFRs and then using the EDE. The EDE diagnosis was then compared to the DFR diagnosis. In other words, the DFR diagnosis was used as the criterion and the instrument in question was the EDE. Currently, BED is classified in the DSM-IV-TR (American Psychiatric Association, 1994) as Eating Disorder Not Otherwise Specified and does not have its own set of criteria. However, research criteria for BED are included in Appendix B of the DSM-IV-TR (APA, 1994). These criteria include the presence of binge eating two days per week for the past six months and the absence of regular compensatory behaviors. Episodes of binge eating are defined as “eating, in a discrete period of time, an amount of food that is definitely larger than most people would eat in a similar period of time under similar circumstances” and must include “a sense of loss of control over eating during the episode” (p. 787). The binge eating must also be characterized by at least three of the following: eating more rapidly than normal, eating until feeling uncomfortably full, eating large amounts of food when not physically hungry, eating alone because of being embarrassed by how much one is eating, and feeling disgusted with oneself, depressed or very guilty after overeating.

Currently, the eating disorder workgroup for DSM-V is considering changing the criteria for BED. One possible change is to decrease the frequency criteria for binge eating to once per week. A second change being considered is to eliminate the "large amount of food" criterion for a binge episode. This would mean that both OBEs and SBEs would be considered "binges." Thus, four analyses were conducted that allowed for the comparison of the sensitivity, specificity, PPV, and NPV of the EDE across these various criteria sets: OBEs twice per week in Month 1, OBEs once per week in Month 1, Total episodes (OBEs + SBEs) twice per week in Month 1, and Total episodes once per week in Month 1. Given that the duration criteria for BED are likely to change to 3 months, two additional analyses were conducted: OBEs twice per week in Months 1-3 and OBEs once per week in Months 1-3. The sensitivity, specificity, PPV, and NPV of the EDE could not be conducted for the past three months for the frequency of Total episodes because the frequency of SBEs was not assessed in Months 2 or 3 by the EDE. Distress was not used as a criterion for BED because this variable was not captured on the daily food records; thus, there is no comparison for distress reported on the EDE.

Discriminant validity. To date, there is no research on whether the EDE demonstrates discriminant validity with regard to the assessment of binge eating. Thus, this study tested whether the EDE correlated more strongly with another measure of binge eating than it did with assessments of other constructs, specifically depression, self-esteem, and shape concern.

I hypothesized that both the EDE and Daily Food Records would demonstrate discriminant validity when compared to measures of depression, self-esteem, and shape concern. The discriminant validity of the EDE was supported if the correlation between the frequency of OBE days reported on the EDE and Daily Food Records was stronger than each of the following: the correlation between the frequency of OBEs reported on the EDE and scores on measures of depression (IDS-SR), self-esteem (RSE), and body dissatisfaction (BSQ). Similar analyses were performed in which the frequency of OBE days was replaced in the above by the following variables: the frequency of OBE episodes, SBE days, SBE episodes, Total days, or Total episodes.

First, the number of OBE days reported on the EDE was correlated with the following variables: the number of OBE days reported on Daily Food Records, depression scores (IDS-SR), self-esteem scores (RSE), and body dissatisfaction scores (BSQ). Likewise, the number of OBE days reported on Daily Food Records was correlated with the following variables: the number of OBE days reported on the EDE, depression scores (IDS-SR), self-esteem scores (RSE), and body dissatisfaction scores (BSQ). This correlation matrix was repeated five times, replacing OBE days with each of the following: OBE episodes, SBE days, SBE episodes, Total days, and Total episodes. See Figure 5 for a graph of the proposed correlation matrix.

To test the hypothesis that the EDE demonstrated discriminant validity, the correlation between the frequency of OBE days reported on the EDE and Daily Food

Records was compared to the correlation between the frequency of OBEs reported on the EDE and measures of depression (IDS-SR), self-esteem (RSE), and body dissatisfaction scores (BSQ). These correlations were compared using the method described above. This analysis was replicated for the assessment of OBE episodes, SBE days, SBE episodes, Total days, and Total episodes. See Figure 6 for a graphical representation of these analyses.

Analysis of contamination. Although comparing the frequency of binge eating reported on the EDE and Daily Food Records gives information with regard to the correspondence of the two measures, it does not provide information on which instrument is a more accurate assessment of the construct of binge eating. As there is no completely accurate measure of binge eating with which to compare these two instruments, the validity of these measures will be tested by assessing their relationships to measures of theoretically-related constructs.

I hypothesized that Daily Food Records would provide a more accurate assessment of binge eating. The EDE is hypothesized to be less accurate because it relies on recall, which can be contaminated by mood states. To test this hypothesis, the correlation between the number of OBE days reported on the EDE and scores on the measure of depression (IDS-SR) was compared to the correlation between the number of OBE days reported on the Daily Food Records and the measure of depression (IDS-SR). If the EDE was more contaminated by mood than the Daily Food Records, the correlation between the EDE and the measure of depression (IDS-SR) would be significantly higher than the correlation between the Daily Food Records and the measure of depression

(IDS-SR). This comparison was replicated for each of the following: OBE episodes, SBE days, SBE episodes, Total days, and Total episodes. Likewise, the correlation between the EDE and self-esteem (RSE) was compared to the correlation between Daily Food Records and self-esteem (RSE) and the correlation between the EDE and body dissatisfaction (BSQ) was compared to the correlation between the Daily Food Records and body dissatisfaction (BSQ). See Figure 7 for a graphical representation of these analyses.

Results

Preliminary Analyses

The data first were checked for outliers. Data points that were more than 5 standard deviations from the mean were to be omitted (Howell, 2002); however, no data points fit this description. The primary analysis of this study was to examine whether there was a significant difference between the frequency of OBE episodes reported on the EDE and in the DFRs over the entire three-month time period. A posthoc analysis was conducted to determine whether there was sufficient power to detect a significant difference between the frequency of OBE episodes reported on these two instruments using a matched pairs t-test. Sample size was 34 participants and the data provided a standard deviation of 11.09. Power for possible mean differences was calculated at the significance level of .05, double sided, using MacAnova (Oehlert & Bingham, 2006). These calculations indicated that there was 80% power to detect a mean difference of 5.5 episodes, which represents an effect size of .50. The size of the effect for the difference between frequency of OBE episodes was only available from one study and was found to be .42 (Farchaus Stein et al., 2003). Thus, a sample size of 34 appears to provide adequate power to detect a difference between the frequency of OBE episodes reported during the EDE and in the DFRs.

Interrater agreement was calculated for the coding of OBE days, OBE episodes, SBE days, and SBE episodes in 20% of the sample. Determining the interrater agreement by calculating the proportion of agreement among raters does not take into account that agreement may occur by chance. Thus, Tinsley and Weiss (1975) recommended the equation presented by Lawlis and Lu (1972) to determine whether there is interrater agreement that is significantly different than interrater agreement due to chance. Tinsley and Weiss also recommended calculating a T statistic, which indicates the extent of the interrater agreement and is interpreted on the same scale as Cohen's kappa. The coding for OBE days and SBE days was categorical, either a binge occurred on that day or not; thus, the proportion of agreement based on chance alone is 50%. Based on a chance agreement of 50%, there was almost perfect agreement for the coding of OBE days, $\chi^2(1, N=433) = 382.56$, $p<.001$; T = 93.8, and SBE days, $\chi^2(1, N=433) = 363.99$, $p<.001$; T = 91.7.

The coding of OBE episodes and SBE episodes was continuous because a participant could have x number of episodes on a particular day. There are no current data on the maximum number of episodes people with BED experience per day; thus, there was no a priori range for x. Because the proportion of agreements due to chance is needed to determine interrater agreement and is based on the range of responses, a range for the daily frequency of OBE and SBE episodes was determined post hoc. The observed range for OBE episodes was 0-2, representing a 3-point scale, whereas the observed range for SBE episodes was 0-3, representing a 4-point scale. Although a higher frequency of episodes could have been observed, using the smallest possible range is the most conservative approach as it undervalues each observed agreement. Using a 3-point scale, the proportion of agreement based on chance alone is .33. Thus, based on a chance agreement of 33.3%, there was there was almost perfect agreement for the coding of OBE episodes, $\chi^2(1, N=433) = 776.84$, $p<.001$; T = 94.1. Based on a chance agreement of 25%, there was there was almost perfect agreement for the coding of SBE episodes, $\chi^2(1, N=433) = 1127.10$, $p<.001$; T = 93.2.

Comparison of the EDE and Daily Food Records

The results show positive correlations between the EDE and DFRs for all analyses (see Table 20). The correlations between the EDE and DFRs in Month 1 were significant for OBE days, OBE episodes, Total days, and Total episodes. The effect sizes for these correlations were medium to large, ranging from .44 to .54. There were medium-sized correlations between the EDE and DFRs in Month 1 for SBE days or SBE episodes (rs =.25 to .31), but these correlations did not reach significance. Likewise, there were small to medium sized correlations between the EDE and DFRs for OBE days and OBE episodes in Months 2 and 3 (rs =.17 to .32), but these did not reach significance. The correlation between the EDE and DFRs for the total time period (Months 1-3) was significant for OBE days (r = .41), but not for OBE episodes (r = .32). Although the correlations between the EDE and DFRs weakened from Month 1 to Month 3 for both OBE days and OBE episodes, there were no significant differences between the correlations in Month 1 and Month 2, Month 1 and Month 3, or Month 1 and the Total time period.

Overall, participants reported a higher frequency of binge eating on the EDE than were recorded in the DFRs. This difference was significant for OBE days and episodes in Month 1, OBE days and episodes in Month 2, OBE days and episodes in Month 3, and OBE days and episodes for the Total time period. Effect sizes for these differences ranged from .37 to .67. Although participants reported more SBE days and episodes on the EDE than the DFRs for Month 1, these differences were not significant (ds =.07 to .10). Likewise, the differences between the EDE and DFRs for Total days and episodes (OBEs + SBEs) in Month 1 were not significant (ds =.21 to .24). These results are summarized in Tables 20 and 21.

Exclusion of Zero-Pairs

Preliminary analyses indicated that there were several zero-pairs present. Specifically, with regard to the analyses of OBE days and episodes, 13 participants were removed from the analyses for Month 1, 14 for Month 2, five for Month 3, and three for the Total time period. With regard to the analyses of SBE days and episodes in Month 1, five participants were removed from the analyses. Finally, with regard to the Total days and episodes for Month 1, five participants were removed from the analyses.

When the zero-pairs were removed from the analyses, the correlations between the EDE and DFRs remained positive but only two remained significant (see Table 22). Specifically, the correlation between the EDE and DFR for Total episodes in Month 1 (*r* = .38) and the correlation between the EDE and DFRs for OBE days during the Total time period (*r* = .38) remained significant. Overall, the correlations between the EDE and DFR weakened when the zero-pairs were removed. The effect size for the correlations between the EDE and EDE-Q for OBE days and episodes and Total days and episodes in Month 1 and OBE days and episodes in Months 1-3 were medium (as opposed to large in the full sample), ranging from .34 to .41. The effect sizes for the correlations between the EDE and EDE-Q for SBE days and episodes in Month 1 were small (as opposed to medium in the full sample), ranging from .15 to .23. Finally, the effect size for the correlations between the EDE and EDE-Q for OBE days and episodes in Months 2 and 3 were small (as opposed to medium in the full sample), ranging from .10 to .17. However, the differences between the correlations in the full and partial samples did not reach significance.

When the zero-pairs were removed from the analyses, the differences between the frequency of binge eating reported on the EDE and the DFRs retained the same pattern. Specifically, participants reported significantly more OBE days and episodes on the EDE at all time points, but there were no significant differences between the EDE and DFRs for SBE days in Month 1, SBE episodes in Month 1, Total days in Month 1, or Total episodes in Month 1. It should be noted that the effect sizes for the difference between the frequency of OBE days and episodes reported on the EDE and in the DFRs increased when zero-pairs were removed, ranging from .53 to .79 as opposed to .37 to .67 for the full sample. The effect sizes for the frequency of SBE days, SBE episodes, Total days, and Total episodes remained approximately the same when the zero-pairs were removed. The results are summarized in Tables 22 and 23.

Comparison of Days and Episodes

The correlation between the EDE and DFR for the frequency of OBE days Month 1 was compared to the correlation between the EDE and DFR for the frequency of OBE episodes in Month 1 and there were no significant differences between these correlations. Similar comparisons were made for the assessment of SBE days and episodes in Month 1, Total days and episodes in Month 1, OBE days and episodes in Month 2, OBE days and episodes in Month 3, and OBE days and episodes during the Total time period and none of these differences reached significance. These analyses were repeated when the zero-pairs were removed and, likewise, there were no significant differences between the correlations between the EDE and DFRs for days versus episodes. Please refer to Table 24 for details.

Comparison of OBEs, SBEs, and Total (OBEs + SBEs) for Days and Episodes Respectively

The correlation between the frequency of OBE days reported on the EDE in Month 1 and in the DFRs in Month 1 was compared to the correlation between the frequency of SBE days reported on the EDE in Month 1 and in the DFRs in Month 1. Likewise, the correlation between the frequency of OBE days reported on the EDE and in the DFRs in Month 1 was compared to the correlation between the frequency of Total days reported on the EDE and in the DFRs in Month 1. Finally, the correlation between the frequency of SBE days reported on the EDE and in the DFRs in Month 1 was compared to the correlation between the frequency of Total days reported on the EDE and in the DFRs in Month 1. There were no significant differences between any of these correlations. Likewise, there were no significant differences between the correlations when the zero-pairs were removed.

Similarly, the correlation between the frequency of OBE episodes reported on the EDE in Month 1 and in the DFRs in Month 1 was compared to the correlation between the frequency of SBE episodes reported on the EDE in Month 1 and in the DFRs in Month 1. The correlation between the frequency of OBE episodes reported on the EDE and in the DFRs in Month 1 was also compared to the correlation between the frequency of Total episodes reported on the EDE and in the DFRs in Month 1. Finally, the correlation between the frequency of SBE episodes reported on the EDE and in the DFRs in Month 1 was compared to the correlation between the frequency of Total episodes reported on the EDE and in the DFRs in Month 1. Again, there were no significant differences between any of these correlations in the full sample or when the zero-pairs were removed. Thus, the inclusion of zero-pairs did not significantly inflate the convergent validity between the EDE and EDE-Q in this sample. Refer to Table 25 for details.

Individual Differences between the EDE and Daily Food Records

An analysis of individual differences suggests that approximately twice as many participants reported a higher frequency of objective binge eating on the EDE as in the DFRs for all time points. This was in contrast to the finding that approximately the same number of participants reported subjective binge eating on the EDE as in the DFRs. In addition, approximately twice as many participants reported the same frequency of OBEs on the EDE and DFR as reported the same frequency of SBEs on the EDE and DFR. This finding may be due to the higher number of participants who reported zero OBEs on both instruments in Month 1 than reported zero SBEs on both instruments in Month 1. See Figure 9.

Analysis of Sensitivity, Specificity, Positive Predictive Value, and Negative Predictive Value

The sensitivity, specificity, PPV, and NPV of the EDE, using DFR diagnoses as the criterion, were calculated to determine the probability that the participants with and without BED were correctly categorized by the EDE. These analyses were calculated using different diagnostic criteria for BED. When BED was defined as having OBEs twice per week in Month 1 the sensitivity, specificity, and NPV of the EDE ranged from 88% to 100%, but the PPV was only 20%. When BED was defined as having OBEs once per week in Month 1, the sensitivity, specificity, and NPV of the EDE all decreased, ranging from 60% to 92% whereas the PPV increased slightly to 30%. When BED was defined as Total episodes (OBEs + SBEs) twice per week in Month 1, the sensitivity, specificity, PPV, and NPV of the EDE were all moderate, ranging from 57% to 80%. Finally, when BED was defined as Total episodes once per week in Month 1, the sensitivity, specificity, PPV, and NPV of the EDE ranged from 67% to 94%. Although defining BED as OBEs twice per week in Month 1 resulted in the highest sensitivity and specificity, the PPV of the EDE was sacrificed. Defining BED as total binges at a frequency of once per week during Month 1 resulted in acceptable sensitivity and specificity of the EDE without sacrificing the PPV or NPV of the EDE.

When BED was defined as reporting two OBEs per week for three months on the DFRs, the sensitivity, specificity, PPV, and NPV of the EDE ranged from 50% to 94%. When the frequency criterion was changed to an average of one OBE per week for three months, the sensitivity, specificity, PPV, and NPV of the EDE decreased to 33% to 90%. Thus, when using data from all three months, defining BED as OBEs twice per week resulted in higher sensitivity, specificity, PPV, and NPV for the EDE than defining BED as OBEs once per week. See Figures 10-12.

Discriminant Validity

The discriminant validity of the EDE was examined to determine whether the EDE was able to distinguish between the construct of binge eating and related constructs such as body dissatisfaction, depression, and self-esteem. The relationship between the EDE and DFRs was not significantly stronger than the relationship between the EDE and a measure of body dissatisfaction for any type of binge eating (e.g., OBE, SBE). Likewise, the relationship between the EDE and DFRs was not significantly stronger than the relationship between the EDE and a measure of depression for any of the binge eating comparisons. Finally, the relationship between the EDE and DFRs was not significantly stronger than the relationship between the EDE and a measure of self-esteem for any type of binge eating. See Table 26 for the correlation matrix and Table 27 for the comparison of correlations.

Analysis of Contamination

An analysis of contamination was conducted to determine whether the assessment of binge eating using one of the two instruments, the EDE or DFRs, was less influenced by related constructs such as body dissatisfaction, depression, and self-esteem. Body dissatisfaction did not correlate more strongly with the EDE than with the DFRs in any of the binge eating comparisons. Likewise, depression did not correlate more strongly with the EDE than with the DFRs for any type of binge eating. Finally, self-esteem did not correlate more strongly with the EDE than with the DFRs in any of the binge eating comparisons either. See Table 26 for the correlation matrix and Table 28 for the comparison of correlations.

Discussion

The purpose of the current study was to expand on previous research on the convergent validity of the EDE and DFRs by (1) using a BED sample who could not use their recollection of compensatory behaviors to enhance their recollection of binge eating, (2) analyzing the results in a full sample as well as a partial sample in which zero-pairs are removed, (3) examining the convergence between the EDE and DFRs over three months, (4) distinguishing between OBEs and SBEs, (5) examining the convergence of the two instruments with regard to diagnostic status, (6) determining whether the two instruments can distinguish between binge eating and similar constructs (e.g., depression), and (7) whether similar constructs contaminate one instrument more than the other.

The primary purpose of this study was to examine the convergence of the EDE and DFRs. The results demonstrated a positive relationship between the EDE and DFRs suggesting that people who report more binge eating on one instrument also report more binge eating on the other instrument. However, this relationship only reached significance for the assessment of objectively large binges and total binges during Month 1 and objectively large binges during the total three-month time period. There were significant differences between the frequency of binge eating reported on the EDE and DFRs for objectively large binge eating only, with participants reporting significantly more objectively large binges on the EDE than in the DFRs during every time period.

In contrast, the correlation between the EDE and DFRs for subjective binge eating did not reach significance and there were no significant differences in the frequency of binge eating reported on the EDE and DFRs for subjective binge eating. These findings indicate that there was essentially no relationship between the two assessments; participants who reported higher frequencies of subjective binge eating on one instrument did not report higher frequencies of subjective binge eating on the other instrument. The non-significant comparison of means analysis typically implies that there was not a significant difference between the frequency of subjective binge eating reported on the EDE as compared to the DFRs. However, it is important to remember that comparison of means analyses can obscure the fact that some participants may be reporting significantly more binge eating on one instrument than the other and vice versa. The analysis of individual differences supports the latter assertion in this sample. Approximately the same percentage of patients reported more subjective binge eating on the EDE than the DFRs as reported more subjective binge eating on the DFRs than the EDE. Given these findings and the high variance with regard to the assessment of subjective binge eating, it is likely that the non-significant difference between the EDE and DFRs for the assessment of subjective binge eating obscures significant differences in individual scores.

The exclusion of these zero-pairs did not change the results of the comparison of means analysis. Although the exclusion of zero-pairs weakened the correlations between the EDE and DFRs so that most were no longer significant, these changes in the correlations were not significant. It should be noted that this may be due to lower power with smaller samples. In fact, there were changes in the size of the effects when the zero-pairs were removed. With regard to the correlations between the EDE and DFRs, large effects in the full sample were reduced to medium effects in the partial sample and medium effects were reduced to small effects. Likewise, with regard to the mean differences between EDE and DFRs for the assessment of OBE days and episodes in Months 1, 2, and 3, small and medium effects in the full sample increased to medium and large effects in the partial sample respectively. Thus, the convergent validity between the EDE and the DFRs was lower when zero-pairs were removed from the analyses.

Secondary analyses examined whether there were differences in the convergence between the EDE and DFRs (1) across time, (2) for the assessment of binge days versus binge episodes, and (3) for the assessment of objective versus subjective versus total binge eating. The results indicated that there were no significant differences in the relationship between the EDE and DFRs over time. However, this finding may be due to insufficient power. The convergence between the EDE and the DFRs was not significantly stronger for binge days or binge episodes for any type of binge eating or during any time period. Finally, there were no significant differences in the relationships between the EDE and DFR for the assessment of OBEs, SBEs, or Total episodes. The results from these secondary analyses were replicated when the zero-pairs were excluded from the analyses. Thus, the evidence suggested that there was no significant difference in the validity of assessing objectively large binge episodes across time, assessing days versus episodes, or assessing objective versus subjective versus total binge eating.

Analyses of sensitivity and specificity indicate that the sensitivity and specificity of the EDE vary as the criterion set for BED varies. Specifically, as the criteria for BED became less stringent, the sensitivity of the EDE increased and the specificity of the EDE decreased. In other words, as the criteria became less stringent, the probability of obtaining a false positive increases and the probability of obtaining a false negative decreases. This may be considered an advantageous exchange as incorrectly identifying a person as not having BED may prevent treatment of the disorder. Additionally, when the criteria for BED became less stringent, the PPV of the EDE also increased (i.e., the probability that a person identified by the EDE as having BED actually has BED increases). This has important implications for research studies in particular as the EDE is often used as a diagnostic assessment in research.

Importantly, the proposed criteria for DSM-V define BED as OBEs occurring on average twice per week for three months (APA, 2010). Thus, these data provide an approximate comparison of the sensitivity, specificity, PPV, and NPV of the EDE when using the DSM-IV-TR versus the DSM-V criteria for BED. These data suggest that the sensitivity, PPV, and NPV of the EDE are all higher using the DSM-IV-TR criteria whereas the specificity of the EDE is higher using the DSM-V criteria. However, the specificity of the EDE only decreased slightly, from 73% to 67%, when using DSM-IV-TR criteria rather than DSM-V criteria. These data suggest that the DSM-V criteria do not provide an improvement in the criteria for BED with regard to accuracy of symptom assessment.

The EDE did not demonstrate disciminant validity from measures of related constructs as the correlations between the EDE and the DFR were not significantly stronger than the correlations between the EDE and measures of body dissatisfaction, depression, or self-esteem. These findings indicate that the EDE was not able to distinguish between binge eating and body dissatisfaction, depression, or self-esteem. However, it should be noted that the relationship between the EDE and measures of body dissatisfaction, depression, and self-esteem were not significantly stronger than the relationships between the DFRs and measures of body dissatisfaction, depression, and self-esteem. Thus, the EDE was not significantly more contaminated by body dissatisfaction, depression, and self-esteem than were the DFRs.

Overall, these data provide support for the validity of the EDE to estimate the frequency of objective binge eating and total binge frequency recorded on the DFRs in Month 1. The data provide limited support for the validity of the EDE with regard to the assessment of subjective binge eating in Month 1 or objective binge eating in Months 2 or 3. The results do not support the ability of the EDE to discriminate between the assessment of binge eating as measured by DFRs and the assessment of related constructs such as body dissatisfaction, depression, and self-esteem. However, the results suggest that the EDE and DFRs were equally contaminated by body dissatisfaction, depression, and self-esteem.

Although the EDE demonstrated convergent validity with the DFRs for the assessment of objective binge eating and total bingeing, the inconsistencies between these instruments had a significant impact on the sensitivity, specificity, PPV, and NPV of the EDE. Unfortunately, these data do not indicate whether the inconsistencies between the EDE and DFRs are due to a limitation of the EDE, a limitation of the DFRs, or a problem related to the construct of binge eating itself.

Two other studies have compared assessments of binge eating to food records. In the first (Ortega, Waranch, Maldonado, & Hubbard, 1987), eight women with BN reported significantly more binge episodes on weekly recall sheets than in daily food records, with large effect sizes. In the second study (Bardone, Krahn, Goodman, & Searles, 2000), 45 undergraduate women were asked to call an interactive voice response (IVR) system daily to report the number of binge eating episodes they had on the previous day. At the end of 12 weeks, the researchers assessed participants’ binge eating and binge drinking during the previous 12 weeks using a time-line follow-back (TLFB) assessment. The TLFB procedure is a structured interview that orients participants to the past 12 weeks and then asks participants to recall the frequency of behaviors during that period. The TLFB was originally designed to assess alcohol consumption (Sobell et al., 1986). The results indicated that participants were 2.2 times more likely to report regular binge eating during the past 12 weeks when reporting their behaviors using the IVR compared to the TLFB.

These findings suggest that other assessments of retrospective binge eating also perform poorly when compared to daily recordings of binge eating. Based on these data, one might wonder whether the inconsistencies between the EDE and DFRs are simply because the EDE is based on recall. However, it should be noted that in the Ortega et al. (1987) study, there was no significant difference between the frequency of purging recorded in the daily diaries and the frequency recalled at the end of the week at either baseline (Cohen's d = .16) or post-treatment (Cohen's d = .21). These findings have been replicated with the EDE (Farchaus Stein et al., 2003; Loeb et al., 1994; Rosen et al., 1990). Thus, the inconsistencies present in the assessment of binge eating do not appear to be present for the assessment of compensatory behaviors. This suggests that the inconsistencies in the assessment in binge eating are not due to problems inherent in the retrospective recall of behaviors nor are they due to limitations of the EDE specifically. Rather, the consistency with which assessments of binge eating differ in their estimates of binge eating frequency suggest that there may be important limitations with regard to the construct of binge eating.

This study had several strengths. Most notably, this was the first study to compare: (1) the EDE to Daily Food Records for a 3-month time period, (2) the validity of assessing binge days versus binge episodes, (3) the validity of assessing OBEs versus SBEs versus Total binge eating, and (4) the validity of assessing OBEs in Month 1, 2, 3, and Months 1-3. It was also the first study to examine the sensitivity, specificity, PPV, and NPV of the EDE; the discriminant validity of the EDE; and whether the EDE or

DFRs are more contaminated by related constructs (e.g., depression). Finally, this is the only study to identify zero-pairs and re-examine the data after removing such pairs.

Unfortunately, this study also had several limitations, of which the small sample size is arguably the most important. Of the 91 participants that completed an end-of-treatment EDE, only 34 (37%) completed a daily food record within 28 days of the end-of-treatment EDE. Additionally, of the 2,856 data points for the DFRs (84 days x 34 participants), 577 (20.2%) were missing. Although this is a significant amount of missing data, the only other study to ask participants to use daily recordings of binge eating reported a comparable percentage of missing data (17.6%; Bardone et al., 2000). Unfortunately, it is impossible to know whether the DFRs were missing because participants did not record or because they were not in therapy or were not asked to turn in the records.

Given the importance of making correct diagnoses prior to beginning treatment, future studies should examine the 3-month convergent validity of the EDE and DFRs in a sample of non-treatment-seeking eating disorder patients or in a sample of treatment-seeking patients prior to starting treatment as these participants likely experience higher rates of binge eating. Additionally, comparing the convergent validity of the EDE and DFRs to the convergent validity of the EDE-Q and DFRs may provide important information regarding the comparative validity of self-report versus interview-based assessments of binge eating. Finally, with DSM-V on the horizon, it is important to remember that the criteria for eating disorders may change soon. Given that the EDE is one of the most widely used diagnostic instruments, it may be beneficial to examine the criterion-oriented validity of the EDE with regard to possible criteria sets. Comparing the criterion-oriented validity of the EDE for different criteria sets could provide useful information not only for the validity of the EDE, but also the validity of the criteria sets.

Table 1. Test-Retest Reliability of EDE

	N	Restraint	Eating Concern	Shape Concern	Weight Concern	Objective Bulimic Days	Objective Bulimic Episodes	Subjective Bulimic Days	Subjective Bulimic Episodes	Vomiting Days	Vomiting Episodes
Grilo et al. (2003)§	18	.88**	.51*	.50*	.52*	.71**	.70**	.17	.17	-	-
Rizvi et al. (2000)±	20	.76**	.74**	.76**	.71**	.83**	.85**	.40	.34	.97**	.97**

**p* <.05; **p<.001

±Spearman's rho

§Pearson Product Moment Correlation

EDE: Eating Disorder Examination

Table 2. Inter-Rater Reliability of the EDE

	N	Restraint	Eating Concern	Shape Concern	Weight Concern	Objective Bulimic Days	Objective Bulimic Episodes	Subjective Bulimic Days	Subjective Bulimic Episodes	Vomiting Days	Vomiting Episodes
Grilo et al. (2003)§	18	.96*	.90*	.84*	.65*	.99*	.98*	.91*	.91*	-	-
Rizvi et al. (2000)±	20	.95*	.94*	.90*	.99*	.99*	.99*	.99*	.91*	1.0*	1.0*
Rosen et al. (1990)¥	106	.92	.98	.99	.95	-	-	-	-	-	-

**p* <.001; ¥Significance levels were not provided

§Pearson Product Moment Correlation

±Spearman's rho

EDE: Eating Disorder Examination

Table 3. Internal Consistency of the EDE

	N	Restraint	Eating Concern	Shape Concern	Weight Concern
Beumont et al. (2003)	116	.78	.68	.70	.70
Byrne et al. (in press)[a]	158	.64	.68	.85	.76
Byrne et al. (in press)[b]	317	.65	.44	.77	.69
Byrne et al. (in press)[c]	170	.58	.69	.79	.67
Cooper et al. (1989)	142	.75	.78	.79	.67
Grilo et al. (in press)	688	.63	.60	.68	.51

EDE: Eating Disorder Examination

[a] Eating disorder sample

[b] Community sample

[c] Obese sample

Table 4. Test-Retest Reliability of the EDE-Q

SHORT-TERM TEST-RETEST RELIABILITY											
	N	Restraint	Eating Concern	Shape Concern	Weight Concern	Objective Bulimic Episodes	Subjective Bulimic Episodes	Objective Overeating Episodes	Vomiting	Laxative Use	Diuretic Use
Luce & Crowther (1999)§	139	.81**	.87**	.94**	.92**	.68**	-	-	.92**	.65**	.54**
Reas et al. (2006)±	86	.77**	.72**	.66**	.71**	.84**	.51**	.39**	-	-	-

EDE-Q: LONG-TERM TEST-RETEST RELIABILITY							
	N	Restraint	Eating Concern	Shape Concern	Weight Concern	Objective Bulimic Episodes	Subjective Bulimic Episodes	Exercise
Mond et al. (2004)a	196	.57**	.77**	.75**	.73**	.44*	.28*	.31*

* p<=.01, ** p<=.001

±Spearman's rho

§Pearson Product Moment Correlation

EDE-Q: Eating Disorder Examination-Questionnaire

Table 5. Internal Consistency of the EDE-Q

	N	Restraint	Eating Concern	Shape Concern	Weight Concern
Luce & Crowther, 1999*	203	.84	.78	.93	.89
Luce & Crowther, 1999^	139	.85	.81	.92	.89
Mond et al., 2004a	208	-	.73	.87	-
Peterson et al., 2007	203	.70	.73	.83	.72

*Time 1

^Time 2

EDE-Q: Eating Disorder Examination-Questionnaire

Table 6. Ability of the EDE to Detect Group Differences

		Cooper et al. (1989)						Wilson & Smith (1989)				Wilfley et al. (2000)				
					Cohen's d						Cohen's d				Cohen's d	
		N	Mean	SD	AN/NW	BN/NW	AN/BN	N	Mean	SD	BN/ NW	N	Mean	SD	BED/NW	BED/OW
Restraint	AN	47	3.17	1.47	1.83	2.06	0.02	-	-	-	0.40	-	-	-	0.94	.16
	BN	53	3.14	1.22				15	3.27	0.26		-	-	-		
	BED	-	-	-				-	-	-		105	1.90	1.20		
	NW	42	0.91	0.91				15	3.15	0.33		42	0.90	0.90		
	OW	-	-	-				-	-	-		15	1.70	1.30		
Eating Concern	AN	47	2.17	1.62	1.65	2.31	0.18	-	-	-	3.96	-	-	-	1.06	.74
	BN	53	2.43	1.30				15	2.4	0.34		-	-	-		
	BED	-	-	-				-	-	-		105	1.80	2.10		
	NW	42	0.22	0.33				15	1.25	0.23		42	0.20	0.30		
	OW	-	-	-				-	-	-		15	0.60	0.90		
Shape Concern	AN	47	2.85	1.22	2.16	2.64	0.54	-	-	-	4.87	-	-	-	3.5	1.35
	BN	53	3.55	1.35				15	3.82	0.31		-	-	-		
	BED	-	-	-				-	-	-		105	3.40	1.00		
	NW	42	0.64	0.75				15	2.55	0.20		42	0.50	.60		
	OW	-	-	-				-	-	-		15	1.90	1.20		
Weight Concern	AN	47	2.40	1.48	1.64	2.34	0.50	-	-	-	6.68	-	-	-	3.86	1.69
	BN	53	3.14	1.44				15	3.96	0.34		-	-	-		
	BED	-	-	-				-	-	-		105	3.90	0.90		
	NW	42	0.52	0.62				15	2.12	0.19		42	0.60	0.80		
	OW	-	-	-				-	-	-		15	2.00	1.30		
OBEs	AN	47	10.40	23.60	0.62	1.34	0.62	-	-	-	-	-	-	-	2.55	2.54
	BN	53	26.50	27.80				-	-	-		-	-	-		
	BED	-	-	-				-	-	-		105	20.10	11.10		
	NW	42	0.00	0.00				-	-	-		42	0.00	0.00		
	OW	-	-	-				-	-	-		15	0.00	0.00		
Self-Induced Vomiting	AN	47	18.00	40.80	0.62	1.22	0.33	-	-	-	-	-	-	-	1.86	1.87
	BN	53	30.80	35.50				-	-	-		-	-	-		
	BED	-	-	-				-	-	-		105	0.04	0.03		
	NW	42	0.00	0.00				-	-	-		42	0.00	0.00		
	OW	-	-	-				-	-	-		15	0.00	0.00		

EDE: Eating Disorder Examination; NW: Normal Weight Control, OW: Overweight Control

Table 7. Convergence of the EDE Subscales and Measures of Similar Constructs

Restraint	N	Non-vomited Caloric Intake	Frequency of Regular Meals	Frequency of Snack Foods	EAT Dieting Subscale	EAT Oral Control Subscale	TFEQ Restraint Scale
Loeb et al. (1994)	82	-	-	-	.54*	.22***	.48*
Rosen et al. (1990)	106	-.39***	-.37***	-.22**	-	-	-

Eating Concern	N	Frequency of Binge Eating	Caloric Size of Binge Episodes	EAT Dieting Subscale	EAT Bulimia & Food Preoccupation Subscale
Loeb et al. (1994)	82	-	-	.37*	.35**
Rosen et al. (1990)	106	.50***	.52***	-	-

Shape Concern	N	BSQ	EAT Dieting Subscale
Loeb et al. (1994)	82	.76*	.36*
Rosen et al. (1990)	106	.82***	-

Weight Concern	N	BSQ	EAT Dieting Subscale
Loeb et al. (1994)	82	.61*	.35**
Rosen et al. (1990)	106	.78***	-

**p* <.05, ***p* ≤.01, ****p* <.001

EDE: Eating Disorder Examination; EAT: Eating Attitudes Test; TFEQ: Three Factor Eating Questionnaire; BSQ: Body Shape Questionnaire

Table 8. Convergence of the EDE and EDE-Q for the Restraint Subscale

			EDE	EDE-Q	Mean (SD)		Paired t-test /	% within
		N	Mean (SD)	Mean (SD)	Difference§	r / tau b	Wilcoxon matched	1 point
AN	Binford et al. (2005)	24	1.87 (1.63)	1.70 (1.98)	-0.17 (--)	.71**	-0.57	75%
	Passi et al. (2003)	28	2.59 (2.01)	3.08 (1.94)	0.49 (--)	.71***	1.67	54%
	Sysko, Walsh, Schebendach, et al. (2005)	12	4.40 (1.24)	5.07 (0.99)	-	-	-	-
	Wolk et al. (2005)	60	4.30 (1.40)	4.70 (1.60)	0.34 (1.50)	.49****	1.70	65%
BN	Binford et al. (2005)	21	4.12 (1.00)	4.50 (1.16)	0.38 (--)	.79**	2.43*	81%
AN & BN Combined	Fairburn & Beglin (1994)	36	-	-	-	.78***	1.50	75%
EDNOS	Binford et al. (2005)	25	3.68 (1.72)	3.76 (1.73)	0.08 (--)	.85**	0.40	76%
BED	Grilo et al. (2001)a	82	1.84 (1.14)	2.74 (1.54)	0.90 (--)	.69***	7.27***	-
	Grilo et al. (2001)b	47	1.56 (0.92)	2.12 (1.44)	0.56 (--)	.59***	3.35**	-
	Wilfley et al. (1997)	52	2.00 (1.20)	2.50 (1.50)	0.50 (1.10)	.66****	3.03**	62%
Community Sample	Fairburn & Beglin (1994)	243	0.94 (1.09)	1.25 (1.32)	0.30 (0.80)	.81***	6.26***	79%
	Mond et al. (2004)b	195	1.04 (1.33)	1.29 (1.27)	0.25 (--)	.71***	3.51***	-
Bariatric Surgery	Kalarchian et al. (2000)	98	1.60 (1.50)	2.09 (1.50)	0.49 (1.30)	.60****	3.70***	60%
	de Zwaan et al. (2004)	45	0.56 (0.90)	1.38 (1.30)	0.82 (1.10)	.54***	4.93***	62%
Substance Abusers	Black & Wilson (1996)	48	1.29 (1.67)	1.63 (1.80)	0.33 (1.20)	.75****	1.88	75%

*p<=.05, **p<=.01, ***p<=.001, ****p<=.0001

§EDE-Q rating minus EDE rating

EDE: Eating Disorder Examination; EDE-Q: Eating Disorder Examination Questionnaire

Table 9. Convergence of the EDE and EDE-Q for the Eating Concern Subscale

		N	EDE Mean (SD)	EDE-Q Mean (SD)	Mean (SD) Difference§	r / tau b	Paired t-test / Wilcoxon matched	% within 1 point
AN	Binford et al. (2005)	24	1.15 (1.25)	1.39 (1.43)	0.24 (--)	.90**	1.91	96%
	Passi et al. (2003)	28	1.21 (1.32)	2.23 (1.68)	1.02 (--)	.67***	4.23***	50%
	Sysko, Walsh, Schebendach, et al. (2005)	12	4.33 (1.01)	4.67 (1.29)	-	-	-	-
	Wolk et al. (2005)	60	3.30 (1.50)	4.00 (1.30)	0.64 (1.40)	.51***	3.50***	62%
BN	Binford et al. (2005)	21	3.43 (1.08)	4.40 (1.16)	0.97 (--)	.75**	5.56***	57%
EDNOS	Binford et al. (2005)	25	2.60 (1.51)	2.78 (1.69)	0.18 (--)	.94**	1.51	96%
BED	Grilo et al. (2001)a	82	2.62 (3.74)	3.90 (1.26)	1.28 (3.52)	.33**	3.33***	-
	Grilo et al. (2001)b	47	1.64 (1.02)	3.54 (1.14)	1.92 (1.04)	.55***	12.53***	-
	Wilfley et al. (1997)	52	1.70 (1.10)	3.40 (1.40)	1.70 (1.00)	.59****	11.14***	30%
Community Sample	Fairburn & Beglin (1994)	243	0.27 (0.59)	0.62 (0.86)	0.35 (--)	-	-	-
	Mond et al. (2004)b	195	0.22 (0.52)	0.59 (0.84)	0.37 (--)	.68***	8.26****	-
Bariatric Surgery	Kalarchian et al. (2000)	98	1.34 (1.40)	2.43 (1.50)	1.09 (1.30)	.62****	8.41****	50%
	de Zwaan et al. (2004)	45	0.53 (0.80)	0.79 (0.80)	0.25 (0.50)	.80***	3.21**	93%
Substance Abusers	Black & Wilson (1996)	48	0.78 (1.19)	1.26 (1.47)	-	-	-	-

*p<=.05, **p<=.01, ***p<=.001, ****p<=.0001

§EDE-Q rating minus EDE rating

EDE: Eating Disorder Examination; EDE-Q: Eating Disorder Examination Questionnaire

Table 10. Convergence of the EDE and EDE-Q for the Shape Concern Subscale

			EDE	EDE-Q	Mean (SD)		Paired t-test /	% within
		N	Mean (SD)	Mean (SD)	Difference§	r / tau b	Wilcoxon matched	1 point
AN	Binford et al. (2005)	24	1.93 (1.60)	2.21 (1.95)	0.28 (--)	.89**	1.54	75%
	Passi et al. (2003)	28	2.76 (1.66)	3.40 (1.89)	0.64 (--)	.91***	4.29****	64%
	Sysko, Walsh, Schebendach, et al. (2005)	12	4.86 (0.99)	5.40 (0.76)	-	-	-	-
	Wolk et al. (2005)	60	4.40 (1.30)	4.80 (1.20)	0.46 (0.74)	.83****	4.80****	78%
BN	Binford et al. (2005)	21	4.42 (1.20)	4.95 (1.19)	0.53 (--)	.85**	3.67**	71%
	Carter et al. (2001)	57	5.30 (1.20)	5.00 (1.60)	-0.30 (--)	.43**	-0.88	-
AN & BN Combined	Fairburn & Beglin (1994)	36	-	-	-	.83***	5.18***	67%
EDNOS	Binford et al. (2005)	25	3.86 (1.77)	4.28 (1.81)	0.42 (--)	.82**	1.92	60%
BED	Grilo et al. (2001)a	82	3.63 (1.39)	4.94 (1.06)	1.31 (--)	.56***	10.03***	-
	Grilo et al. (2001)b	47	3.24 (0.81)	4.70 (0.89)	1.46 (--)	.42**	13.71***	-
	Wilfley et al. (1997)	52	3.80 (0.90)	4.80 (1.10)	1.00 (0.80)	.69****	8.52****	49%
Community Sample	Fairburn & Beglin (1994)	243	1.34 (1.09)	2.15 (1.60)	0.80 (1.00)	.80***	12.88***	64%
	Mond et al. (2004)b	195	1.31 (1.17)	2.16 (1.44)	0.85 (--)	.78***	12.07***	-
Bariatric Surgery	Kalarchian et al. (2000)	98	3.28 (1.40)	4.28 (1.30)	1.00 (1.30)	.77****	10.96****	56%
	de Zwaan et al. (2004)	45	1.71 (1.10)	1.71 (1.30)	0.01 (0.80)	.80***	0.05	91%
Substance Abusers	Black & Wilson (1996)	48	2.31 (1.69)	2.22 (1.51)	0.63 (1.00)	.84****	4.28****	67%

*p<=.05, **p<=.01, ***p<=.001, ****p<=.0001

§EDE-Q rating minus EDE rating

EDE: Eating Disorder Examination; EDE-Q: Eating Disorder Examination Questionnaire

Table 11. Convergence of the EDE and EDE-Q for the Weight Concern Subscale

			EDE	EDE-Q	Mean (SD)		Paired t-test /	% within
		N	Mean (SD)	Mean (SD)	Difference[§]	r / tau b	Wilcoxon matched	1 point
AN	Binford et al. (2005)	24	1.65 (1.49)	1.88 (1.84)	0.23 (--)	.83**	1.10	71%
	Passi et al. (2003)	28	2.18 (1.60)	2.59 (1.68)	0.41 (--)	.82***	2.12*	71%
	Sysko, Walsh, Schebendach, et al. (2005)	12	4.32 (1.21)	5.07 (1.20)	-	-	-	-
	Wolk et al. (2005)	60	3.90 (1.70)	4.60 (1.40)	0.68 (1.40)	.61***	3.90***	62%
BN	Binford et al. (2005)	21	4.45 (1.40)	4.81 (1.39)	0.36 (--)	.87**	2.33*	71%
	Carter et al. (2001)	57	5.10 (1.20)	4.70 (1.90)	-0.40 (--)	.54**	-1.65	-
AN & BN Combined	Fairburn & Beglin (1994)	36	-	-	-	.85***	3.20***	56%
EDNOS	Binford et al. (2005)	25	3.53 (1.67)	3.92 (1.71)	0.39 (--)	.88**	2.40*	80%
BED	Grilo et al. (2001)a	82	3.36 (1.26)	4.22 (1.08)	0.86 (--)	.66***	8.05***	-
	Grilo et al. (2001)b	47	3.30 (0.72)	3.82 (0.86)	0.52 (--)	.63***	4.24***	-
	Wilfley et al. (1997)	52	3.40 (1.00)	4.10 (1.10)	0.70 (0.90)	.63****	5.37****	64%
Community Sample	Fairburn & Beglin (1994)	243	1.18 (0.93)	1.59 (1.37)	0.40 (0.90)	.79***	7.40***	74%
	Mond et al. (2004)b	195	1.12 (1.06)	1.64 (1.31)	0.52 (--)	.77***	8.53***	-
Bariatric Surgery	Kalarchian et al. (2000)	98	3.30 (1.10)	4.05 (1.20)	0.75 (0.90)	.71****	8.52****	67%
	de Zwaan et al. (2004)	45	1.46 (1.10)	1.46 (1.10)	0.00 (0.70)	.79***	0.00	91%
Substance Abusers	Black & Wilson (1996)	48	1.88 (1.67)	2.23 (1.66)	0.35 (0.90)	.85****	2.72****	81%

*p<=.05, **p<=.01, ***p<=.001, ****p<=.0001

[§] EDE-Q rating minus EDE rating

EDE: Eating Disorder Examination; EDE-Q: Eating Disorder Examination Questionnaire

Table 12. Convergence of the EDE and EDE-Q for the Frequency of OBEs

			Days vs.	EDE	EDE-Q	Mean (SD)		Paired t-test /
		N	Episodes	Mean (SD)	Mean (SD)	Difference§	r / tau b	Wilcoxon matched
AN	Wolk et al. (2005)	60	days	07.10 (10.70)	08.80 (11.20)	01.70 (04.40)	.92***	-3.00**
BN	Binford et al. (2005)	21	episodes	29.43 (24.32)	17.65 (14.86)	-12.70 (21.00)	.48***	2.54**
	Carter et al. (2001)	57	episodes	27.80 (24.40)	23.70 (28.30)	-04.10 (--)	.56**	2.97**
	Sysko et al. (2005)¥	50	episodes	22.62 (15.72)	16.94 (13.63)	-05.63 (11.85)	.63***	3.33*
AN & BN Combined	Fairburn & Beglin (1994)	36	days	-	-	02.50 (06.90)	.60***	-1.96*
EDNOS	Binford et al. (2005)	25	episodes	03.49 (06.33)	03.96 (06.23)	00.17 (--)	.40*	-0.21
BED	Goldfein et al. (2005)	37	days	15.50 (06.21)	17.40 (09.06)	01.86 (--)	.20	-1.14
	Grilo et al. (2001)a	82	episodes	20.40 (11.90)	17.80 (11.60)	-02.70 (12.30)	.29***	1.71
	Grilo et al. (2001)b	47	episodes	17.40 (11.70)	14.20 (08.90)	-03.20 (11.50)	.28**	1.91
	Wilfley et al. (1997)	52	days	17.40 (07.00)	13.40 (08.50)	-04.00 (--)	.20	3.90**
Community Sample	Fairburn & Beglin (1994)	243	days	00.47 (02.28)	01.25 (03.49)	00.80 (03.00)	.45*	-4.40***
	Mond et al. (2004)b	195	episodes	13.33 (12.50)	08.17 (07.57)	-05.16 (--)	.93**	1.63
Bariatric Surgery	Kalarchian et al. (2000)	98	episodes	09.32 (19.80)	05.71 (12.70)	-03.61 (--)	.46****	0.13
Substance Abusers	Black & Wilson (1996)	48	episodes	02.35 (06.21)	04.46 (17.01)	02.14 (15.00)	.53****	-0.61

*p<=.05, **p<=.01, ***p<=.001, ****p<=.0001

§EDE-Q rating minus EDE rating

¥Pretreatment

±Posttreatment

EDE: Eating Disorder Examination; EDE-Q: Eating Disorder Examination Questionnaire; OBEs: Objective Bulimic Episodes

Table 13. Convergence of the EDE and EDE-Q for SBE Frequency

			Days or	EDE	EDE-Q	Mean (SD)		Paired t-test /
		N	Episodes	Mean (SD)	Mean (SD)	Difference[§]	r / tau b	Wilcoxon matched
BN	Binford et al. (2005)	21	episodes	15.71 (22.44)	10.00 (16.21)	-04.80 (26.94)	.21	0.71
	Carter et al. (2001)	57	episodes	16.70 (21.50)	12.00 (15.00)	-04.70 (--)	.46**	0.43
	Sysko et al. (2005)[¥]	50	episodes	19.48 (20.53)	10.98 (09.89)	-08.42 (17.89)	.60***	3.26*
EDNOS	Binford et al. (2005)	25	episodes	17.64 (25.81)	07.26 (10.41)	-05.61 (10.09)	.50***	2.31*
BED	Grilo et al. (2001)a	82	episodes	04.80 (09.40)	04.30 (08.10)	-00.50 (11.20)	-.06	0.57
	Grilo et al. (2001)b	47	episodes	02.60 (04.60)	03.20 (05.50)	00.60 (--)	-.09	-0.59
Community Sample	Mond et al. (2004)b	195	episodes	10.57 (12.52)	07.29 (09.57)	-03.28 (--)	.78*	0.41
Bariatric Surgery	Kalarchian et al. (2000)	98	episodes	02.13 (05.50)	03.20 (07.10)	00.35 (05.50)	.41**	0.43

*p<=.05, **p<=.01, ***p<=.001

[§] EDE-Q rating minus EDE rating

[¥] Pretreatment

[±] Posttreatment

EDE: Eating Disorder Examination; EDE-Q: Eating Disorder Examination Questionnaire; SBEs: Subjective Bulimic Episodes

Table 14. Convergence of the EDE and EDE-Q for Frequency of Compensatory Behaviors

			Self-Induced Vomiting			Laxative Misuse		
		N	Mean (SD) Difference[§]	r / tau b	Paired t-test / Wilcoxon matched	Mean (SD) Difference[§]	r / tau b	Paired t-test / Wilcoxon matched
AN	Wolk et al. (2005)	60	00.73 (--)	.88***	-1.00	-00.13 (06.30)	.70***	0.16
BN	Binford et al. (2005)	21	-	.73[a]	-	-	-	-
	Carter et al. (2001)	57	-13.60 (--)	.72**	3.08**	-01.10 (--)	.88**	1.65
	Sysko et al. (2005)[¥]	50	00.52 (02.96)	.88***	-1.24	00.20 (01.27)	.99***	-1.12
	Sysko et al. (2005)[±]	50	-00.10 (03.27)	.95***	0.22	09.00 (12.78)	.99***	-4.98*
AN & BN Combined	Fairburn & Beglin (1994)	36	-00.40 (03.00)	.91***	0.73	-00.50 (03.50)	.89***	0.00
EDNOS	Binford et al. (2005)	25	-	.93[±]	-	-	-	-
Community Sample	Fairburn & Beglin (1994)	243	00.10 (00.60)	.88***	-2.02*	00.10 (00.70)	.60***	-1.27
Substance Abusers	Black & Wilson (1996)	48	-00.06 (00.60)	1.00****	0.01	-00.47 (03.40)	.99****	0.01

*p<=.05, **p<=.01, ***p<=.001, ****p<=.0001

[a] Significance level not reported

[§] EDE-Q rating minus EDE rating

[¥] Pretreatment

[±] Posttreatment

EDE: Eating Disorder Examination; EDE-Q: Eating Disorder Examination Questionnaire

Table 15. Meta-Analysis of EDE and EDE-Q Subscales using Cohen's d

		RESTRAINT				EATING CONCERN				SHAPE CONCERN				WEIGHT CONCERN			
		d	Lower CI	Upper CI	Q	d	Lower CI	Upper CI	Q	d	Lower CI	Upper CI	Q	d	Lower CI	Upper CI	Q
AN	Binford et al. (2005)	-0.09				0.18				0.16				0.14			
	Passi et al. (2003)	0.25				0.68				0.36				0.25			
	Sysko, Walsh, Schebendach, et al. (2005)	0.60				0.29				0.61				0.62			
	Wolk et al. (2005)	0.27				0.50				0.32				0.45			
	Meta-Analysis	**0.22**	**-0.02**	**0.47**	**2.08**	**0.45**	**0.20**	**0.71**	**1.77**	**0.32**	**0.07**	**0.58**	**0.83**	**0.36**	**0.11**	**0.61**	**1.39**
BN	Binford et al. (2005)	0.35				0.87				0.44				0.26			
	Carter et al. (2001)	-				-				-0.21				-0.25			
	Meta-Analysis	**0.35**	**-0.26**	**0.96**	**0.00**	**0.87**	**0.23**	**1.50**	**0.00**	**-0.04**	**-0.35**	**0.28**	**3.24**	**-0.11**	**-0.43**	**0.20**	**1.98**
EDNOS	Binford et al. (2005)	0.05				0.11				0.23				0.23			
	Meta-Analysis	**0.05**	**-0.51**	**0.60**	**0.00**	**0.11**	**-0.44**	**0.67**	**0.00**	**0.23**	**-0.32**	**0.79**	**0.00**	**0.23**	**-0.33**	**0.79**	**0.00**
BED	Grilo et al. (2001)a	0.66				0.51				1.06				0.73			
	Grilo et al. (2001)b	0.46				1.76				1.72				0.66			
	Wilfley et al. (1997)	0.37				1.35				1.00				0.67			
	Meta-Analysis	**0.52**	**0.32**	**0.73**	**1.47**	**0.98**	**0.76**	**1.20**	**23.99**	**1.19**	**0.96**	**1.41**	**6.24**	**0.69**	**0.48**	**0.91**	**0.11**
Community Sample	Fairburn & Beglin (1994)	0.26				0.47				0.59				0.35			
	Mond et al. (2004)b	0.19				0.53				0.65				0.44			
	Meta-Analysis	**0.23**	**0.09**	**0.36**	**0.22**	**0.50**	**0.36**	**0.63**	**0.16**	**0.62**	**0.48**	**0.75**	**0.16**	**0.39**	**0.25**	**0.52**	**0.39**
Bariatric Surgery Patients	Kalarchian et al. (2000)	0.33				0.75				0.74				0.65			
	de Zwaan et al. (2004)	0.73				0.33				0.00				0.00			
	Meta-Analysis	**0.45**	**0.24**	**0.71**	**3.48**	**0.61**	**0.36**	**0.84**	**2.46**	**0.50**	**0.26**	**0.73**	**8.27**	**0.44**	**0.20**	**0.68**	**6.44**
Substance Abusers	Black & Wilson (1996)	0.20				0.36				-0.06				0.21			
	Meta-Analysis	**0.20**	**-0.21**	**0.60**	**0.00**	**0.36**	**-0.05**	**0.76**	**0.00**	**-0.06**	**-0.46**	**0.34**	**0.00**	**0.21**	**-0.19**	**0.61**	**0.00**
TOTAL	**Meta-Analysis**	**0.31**	**0.22**	**0.40**	**16.27**	**0.58**	**0.49**	**0.67**	**48.09***	**0.56**	**.47**	**.65**	**77.42***	**0.39**	**.31**	**.48**	**$29.30^{\pm}$**

$^{\pm}$ *p* < .01; * p < .001

EDE: Eating Disorder Examination; EDE-Q: Eating Disorder Examination-Questionnaire

Table 16. Meta-Analysis of EDE and EDE-Q Subscales using Correlations

		RESTRAINT				EATING CONCERN				SHAPE CONCERN				WEIGHT CONCERN			
		r / tau b	Lower CI	Upper CI	Q	r / tau b	Lower CI	Upper CI	Q	r / tau b	Lower CI	Upper CI	Q	r / tau b	Lower CI	Upper CI	Q
AN	Binford et al. (2005)	.71				.90				.89				.83			
	Passi et al. (2003)	.71				.67				.91				.82			
	Wolk et al. (2005)	.49				.51				.83				.61			
	Meta-Analysis	**.60**	**.41**	**.79**	**1.23**	**.67**	**.48**	**.86**	**2.39**	**.87**	**.67**	**1.06**	**0.13**	**.72**	**.53**	**.92**	**1.17**
BN	Binford et al. (2005)	.79				.75				.85				.87			
	Carter et al. (2001)	-				-				.43				.54			
	Meta-Analysis	**.79**	**.33**	**1.25**	**0.00**	**.75**	**.29**	**1.21**	**0.00**	**.58**	**.35**	**.81**	**2.38**	**.66**	**.43**	**.89**	**1.47**
AN & BN Combined	Fairburn & Beglin (1994)	.78				-	-	-		.83				.85			
	Meta-Analysis	**.78**	**.44**	**1.12**	**0.00**	**-**	**-**	**-**		**.83**	**.49**	**1.17**	**0.00**	**.85**	**.51**	**1.19**	**0.00**
EDNOS	Binford et al. (2005)	.85				.94				.82				.88			
	Meta-Analysis	**.85**	**.43**	**1.27**	**0.00**	**.94**	**.52**	**1.36**	**0.00**	**.82**	**.40**	**1.24**	**0.00**	**.88**	**.46**	**1.30**	**0.00**
BED	Grilo et al. (2001)a	.69				.33				.56				.66			
	Grilo et al. (2001)b	.59				.55				.42				.63			
	Wilfley et al. (1997)	.66				.59				.69				.63			
	Meta-Analysis	**.66**	**.51**	**.81**	**0.28**	**.47**	**.32**	**.62**	**2.52**	**.57**	**.42**	**.72**	**1.69**	**.64**	**.49**	**.79**	**0.04**
Community Sample	Fairburn & Beglin (1994)	.81				-				.80				.79			
	Mond et al. (2004)b	.71				.68				.78				.77			
	Meta-Analysis	**.77**	**.68**	**.86**	**1.07**	**.68**	**.54**	**.82**	**0.00**	**.79**	**.70**	**.89**	**0.04**	**.78**	**.69**	**.88**	**0.04**
Bariatric Surgery Patients	Kalarchian et al. (2000)	.60				.62				.77				.71			
	de Zwaan et al. (2004)	.54				.80				.80				.79			
	Meta-Analysis	**.58**	**.41**	**.75**	**.10**	**.69**	**.52**	**.85**	**0.94**	**.78**	**.61**	**.95**	**0.02**	**.74**	**.57**	**.90**	**0.19**
Substance Abusers	Black & Wilson (1996)	.75				-	-	-		.84				.85			
	Meta-Analysis	**.75**	**.46**	**1.05**	**0.00**	**-**	**-**	**-**		**.84**	**.55**	**1.13**	**0.00**	**.85**	**.56**	**1.14**	**0.00**
TOTAL	**Meta-Analysis**	**.72**	**.65**	**.78**	**9.04**	**.65**	**.57**	**.73**	**13.91**	**.76**	**.70**	**.83**	**16.50**	**.75**	**.69**	**.81**	**7.73**

EDE: Eating Disorder Examination; EDE-Q: Eating Disorder Examination-Questionnaire

Table 17. Meta-Analysis of EDE and EDE-Q Behaviors using Cohen's d

		OBEs				SBEs			
		d	Lower CI	Upper CI	Q	d	Lower CI	Upper CI	Q
AN	Wolk et al. (2005)	0.16				-			
	Meta-Analysis	**0.16**	**-0.20**	**0.51**	**0.00**	**-**	**-**	**-**	**-**
BN	Binford et al. (2005)	-0.58				-0.25			
	Carter et al. (2001)	-0.16				-0.26			
	Sysko et al. (2005)	-0.39				-0.53			
	Meta-Analysis	**-0.31**	**-0.56**	**-0.07**	**1.58**	**-0.36**	**-0.61**	**-0.12**	**1.13**
EDNOS	Binford et al. (2005)	0.07				-0.57			
	Meta-Analysis	**0.07**	**-0.48**	**0.63**	**0.00**	**-0.57**	**-1.13**	**-0.01**	**0.00**
BED	Goldfein et al. (2005)	0.24				-			
	Grilo et al. (2001)a	-0.22				-0.06			
	Grilo et al. (2001)b	-0.31				0.12			
	Wilfley et al. (1997)	-0.51				-			
	Meta-Analysis	**-0.23**	**-0.42**	**-0.04**	**6.31**	**0.01**	**-0.24**	**0.25**	**0.48**
Community Sample	Fairburn & Beglin (1994)	0.26				-			
	Mond et al. (2004)b	-0.50				-0.30			
	Meta-Analysis	**-0.07**	**-0.21**	**0.06**	**30.96**	**-0.30**	**-0.50**	**-0.10**	**0.00**
Bariatric Surgery	Kalarchian et al. (2000)	-0.22				0.17			
	Meta-Analysis	**-0.22**	**-0.50**	**0.06**	**0.00**	**0.17**	**-0.24**	**0.58**	**0.00**
Substance Abusers	Black & Wilson (1996)	0.16				-			
	Meta-Analysis	**0.16**	**-0.24**	**0.57**	**0.00**	**-**	**-**	**-**	**-**
TOTAL	**Meta-Analysis**	**-0.12**	**-0.21**	**-0.03**	**48.09***	**-0.21**	**-0.33**	**-0.09**	**11.78**

* *p* < .001

EDE: Eating Disorder Examination; EDE-Q: Eating Disorder Examination-Questionnaire; OBEs: Objective Bulimic Episodes; SBEs: Subjective Bulimic Episodes

Table 18. Meta-Analysis of EDE and EDE-Q Behaviors using Correlations

		OBEs				**SBEs**				**Self-Induced Vomiting**				**Laxative Misuse**			
		r / tau b	Lower CI	Upper CI	Q	r / tau b	Lower CI	Upper CI	Q	r / tau b	Lower CI	Upper CI	Q	r / tau b	Lower CI	Upper CI	Q
AN	Wolk et al. (2005)	.92				-				.88				.70			
	Meta-Analysis	**.92**	**.66**	**1.18**	**0.00**	**-**	**-**	**-**	**-**	**.88**	**.62**	**1.14**	**0.00**	**.70**	**.44**	**.96**	**0.00**
BN	Binford et al. (2005)	.48				.21				.73				-			
	Carter et al. (2001)	.56				.46				.72				.88			
	Sysko et al. (2005)	.63				.60				.88				.99			
	Meta-Analysis	**.58**	**.40**	**.76**	**0.32**	**.48**	**.30**	**.66**	**1.90**	**.80**	**.61**	**.98**	**0.71**	**.96**	**.77**	**1.16**	**0.30**
AN & BN Combined	Fairburn & Beglin (1994)	.60				-				.91				.89			
	Meta-Analysis	**.60**	**.26**	**.94**	**0.00**	**-**	**-**	**-**	**-**	**.91**	**.57**	**1.25**	**0.00**	**.89**	**.55**	**1.23**	**0.00**
EDNOS	Binford et al. (2005)	.40				.50				.93				-			
	Meta-Analysis	**.40**	**-.02**	**.82**	**0.00**	**.50**	**.08**	**.92**	**0.00**	**.93**	**.51**	**1.35**	**0.00**	**-**	**-**	**-**	**-**
BED	Goldfein et al. (2005)	.20				-				-				-			
	Grilo et al. (2001)a	.29				-.06				-				-			
	Grilo et al. (2001)b	.28				-.09				-				-			
	Wilfley et al. (1997)	.20				-				-				-			
	Meta-Analysis	**.25**	**.12**	**.39**	**0.37**	**-.07**	**-.25**	**.11**	**0.03**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Community Sample	Fairburn & Beglin (1994)	.45				-				.88				.60			
	Mond et al. (2004)b	.93				.78				-				-			
	Meta-Analysis	**.76**	**.67**	**.86**	**24.58**	**.78**	**.64**	**.92**	**0.00**	**.88**	**.75**	**1.00**	**0.00**	**.60**	**.47**	**.73**	**0.00**
Bariatric Surgery Patients	Kalarchian et al. (2000)	.46				-				-				-			
	de Zwaan et al. (2004)	-				.41				-				-			
	Meta-Analysis	**.46**	**.26**	**.66**	**0.00**	**.41**	**.11**	**.71**	**0.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Substance Abusers	Black & Wilson (1996)	.53				-				.99				.99			
	Meta-Analysis	**.53**	**.24**	**.82**	**0.00**	**-**	**-**	**-**	**-**	**.99**	**.70**	**1.28**	**0.00**	**.99**	**.70**	**1.28**	**0.00**
TOTAL	**Meta-Analysis**	**.64**	**.58**	**.70**	**58.40***	**.52**	**.43**	**.61**	**56.37***	**.89**	**.81**	**.98**	**2.38**	**.84**	**.75**	**.93**	**12.35^**

^ *p* < .05; * p < .001

EDE: Eating Disorder Examination; EDE-Q: Eating Disorder Examination-Questionnaire; OBEs: Objective Bulimic Episodes; SBEs: Subjective Bulimic Episodes

Table 19. Convergence of the EDE and DFRs for Binge Eating and Self-Induced Vomiting

		N	Correlation between EDE (7 Days) & DFRs (7 Days)	Correlation between EDE (7 Days) & DFRs (28 Days)	Correlation between EDE (28 Days) & DFRs (7 Days)	Correlation between EDE (28 Days) & DFRs (28 Days)
Binge Eating	Farchus et al. (2003)	13	-	-	-	.60*
	Loeb et al. (1994)[¥]	69	.88**	-	.90**	-
	Loeb et al. (1994)[±]	50-52[§]	.87**	.80**	.91**	.93**
	Rosen et al. (1990)[¥]	106	-	-	.56**	-
Self-Induced Vomiting	Farchus et al. (2003)	13	-	-	-	.75**
	Loeb et al. (1994)[¥]	59-69[§]	.88**	-	.93**	-
	Loeb et al. (1994)[±]	50-52[§]	.98**	.97**	.95**	.99**
	Rosen et al. (1990)[¥]	106	-	-	.90**	-

*p<.01, **p≤.001

[¥] Pretreatment

[±] Posttreatment

[§] N varies due to missing data

EDE: Eating Disorder Examination; DFRs: Daily Food Records

Table 20. Comparison of EDE and DFR in the Full Sample

MONTH 1	N	Mean (EDE)	SD (EDE)	Mean (DFR)	SD (DFR)	r	t	p	d
OBE days	34	2.44	3.61	1.29	2.52	.54**	2.16	0.038	0.37
OBE episodes	34	2.62	4.11	1.35	2.58	.49**	2.03	0.051	0.37
SBE days	34	4.79	6.09	4.24	4.99	.25	0.48	0.636	0.10
SBE episodes	34	5.94	8.26	5.41	6.50	.31	0.35	0.728	0.07
Total days	34	7.24	7.58	5.53	6.34	.44**	1.34	0.191	0.24
Total episodes	34	8.56	9.48	6.76	7.81	.47**	1.16	0.256	0.21

MONTH 2	N	Mean (EDE)	SD (EDE)	Mean (DFR)	SD (DFR)	r	t	p	d
OBE days	33	2.79	4.11	1.00	2.32	.32	2.55	0.016	0.54
OBE episodes	33	2.91	4.39	1.12	2.67	.26	2.28	0.029	0.49

MONTH 3	N	Mean (EDE)	SD (EDE)	Mean (DFR)	SD (DFR)	r	t	p	d
OBE days	34	4.03	4.71	1.47	2.69	.23	3.08	0.004	0.67
OBE episodes	34	4.09	4.72	1.82	3.89	.17	2.37	0.024	0.53

TOTAL MONTHS	N	Mean (EDE)	SD (EDE)	Mean (DFR)	SD (DFR)	r	t	p	d
OBE days	34	9.38	10.59	3.74	6.50	.41*	3.32	0.002	0.64
OBE episodes	34	9.74	10.72	4.26	7.87	.32	2.88	0.007	0.58

*p<.05, **p<.01

EDE: Eating Disorder Examination; DFR: Daily Food Records; OBE: Objective Bulimic Episode; SBE: Subjective Bulimic Episode

Table 21. Significance Testing: OBEs Across Months

DAYS	N	r	Fisher's z	z	p
Month 1	34	.54**	0.60	1.06	0.287
Month 2	33	.32	0.33		
Month 1	34	.54**	0.60	1.46	0.145
Month 3	34	.23	0.23		
Month 1	34	.54**	0.60	0.66	0.507
Total Months	34	.41*	0.44		

EPISODES	N	r	Fisher's z	z	p
Month 1	34	.49**	0.54	1.05	0.292
Month 2	33	.26	0.27		
Month 1	34	.49**	0.54	1.43	0.151
Month 3	34	.17	0.17		
Month 1	34	.49**	0.54	0.81	0.421
Total Months	34	.32	0.33		

*p<.05, **p<.01

OBE: Objective Bulimic Episode

Table 22. Comparison of EDE and DFR when Zero-Pairs are Excluded

MONTH 1	N	Mean (EDE)	SD (EDE)	Mean (DFR)	SD (DFR)	r	t	p	d
OBE days	21	3.95	3.91	2.10	2.95	.41	2.24	0.037	0.53
OBE episodes	21	4.24	4.54	2.19	3.01	.34	2.09	0.050	0.53
SBE days	29	5.62	6.24	4.97	5.06	.15	0.48	0.638	0.11
SBE episodes	29	6.97	8.54	6.34	6.60	.23	0.35	0.729	0.08
Total days	29	8.48	7.52	6.48	6.40	.34	1.34	0.192	0.29
Total episodes	29	10.03	9.52	7.93	7.90	.38*	1.16	0.257	0.24

MONTH 2	N	Mean (EDE)	SD (EDE)	Mean (DFR)	SD (DFR)	r	t	p	d
OBE days	20	4.6	4.44	1.65	2.82	.16	2.71	0.014	0.79
OBE episodes	20	4.8	4.79	1.85	3.25	.10	2.39	0.027	0.72

MONTH 3	N	Mean (EDE)	SD (EDE)	Mean (DFR)	SD (DFR)	r	t	p	d
OBE days	29	4.72	4.77	1.72	2.84	.17	3.15	0.004	0.76
OBE episodes	29	4.79	4.77	2.14	4.14	.11	2.40	0.023	0.59

TOTAL MONTHS	N	Mean (EDE)	SD (EDE)	Mean (DFR)	SD (DFR)	r	t	p	d
OBE days	31	10.29	10.66	4.10	6.71	.38*	3.37	0.002	0.69
OBE episodes	31	10.31	10.78	4.68	8.13	.29	2.91	0.007	0.59

*p<.05, **p<.01

EDE: Eating Disorder Examination; DFR: Daily Food Records; OBE: Objective Bulimic Episode; SBE: Subjective Bulimic Episode

Table 23. Significance Testing: Full Sample versus Exclusion of Zero-Pairs

MONTH 1	Sample	N	r	Fisher's z	z	p
OBE days	Full Sample	34	.54**	0.60	0.57	0.570
	Zero-Pairs Removed	21	.41	0.44		
OBE episodes	Full Sample	34	.49**	0.54	0.58	0.565
	Zero-Pairs Removed	21	.35	0.37		
SBE days	Full Sample	34	.25	0.26	0.39	0.695
	Zero-Pairs Removed	29	.15	0.15		
SBE episodes	Full Sample	34	.31	0.32	0.32	0.745
	Zero-Pairs Removed	29	.23	0.23		
Total days	Full Sample	34	.44**	0.47	0.44	0.657
	Zero-Pairs Removed	29	.34	0.35		
Total episodes	Full Sample	34	.47**	0.51	0.41	0.679
	Zero-Pairs Removed	29	.38*	0.40		

MONTH 2	Sample	N	r	Fisher's z	z	p
OBE days	Full Sample	33	.32	0.33	0.56	0.575
	Zero-Pairs Removed	20	.16	0.16		
OBE episodes	Full Sample	33	.26	0.27	0.55	0.585
	Zero-Pairs Removed	20	.10	0.10		

MONTH 3	Sample	N	r	Fisher's z	z	p
OBE days	Full Sample	34	.23	0.23	0.24	0.814
	Zero-Pairs Removed	29	.17	0.17		
OBE episodes	Full Sample	34	.17	0.17	0.23	0.818
	Zero-Pairs Removed	29	.11	0.11		

TOTAL MONTHS	Sample	N	r	Fisher's z	z	p
OBE days	Full Sample	34	.41*	0.44	0.18	0.892
	Zero-Pairs Removed	31	.38*	0.39		
OBE episodes	Full Sample	34	.32	0.33	0.13	0.899
	Zero-Pairs Removed	31	.29	0.30		

*p<.05, **p<.01

OBE: Objective Bulimic Episode; SBE: Subjective Bulimic Episode

Table 24. Significance Testing: Days versus Episodes

FULL SAMPLE					
MONTH 1	**N**	**r**	**Fisher's z**	**z**	p
OBE days	34	.54**	0.60	0.27	0.789
OBE episodes	34	.49**	0.54		
SBE days	34	.25	0.26	-0.26	0.207
SBE episodes	34	.31	0.32		
Total days	34	.44**	0.47	-0.15	0.882
Total episodes	34	.47**	0.51		

ZERO-PAIRS EXCLUDED					
MONTH 1	**N**	**r**	**Fisher's z**	**z**	p
OBE days	21	.41	0.44	0.21	0.807
OBE episodes	21	.34	0.37		
SBE days	29	.15	0.15	-0.30	0.765
SBE episodes	29	.23	0.23		
Total days	29	.34	0.35	-0.17	0.841
Total episodes	29	.38*	0.40		

FULL SAMPLE					
MONTH 2	**N**	**r**	**Fisher's z**	**z**	p
OBE days	33	.32	0.33	0.25	0.800
OBE episodes	33	.26	0.27		

ZERO-PAIRS EXCLUDED					
MONTH 2	**N**	**r**	**Fisher's z**	**z**	p
OBE days	20	.16	0.16	0.18	0.859
OBE episodes	20	.10	0.10		

FULL SAMPLE					
MONTH 3	**N**	**r**	**Fisher's z**	**z**	p
OBE days	34	.23	0.23	0.25	0.806
OBE episodes	34	.17	0.17		

ZERO-PAIRS EXCLUDED					
MONTH 3	**N**	**r**	**Fisher's z**	**z**	p
OBE days	29	.17	0.17	0.22	0.825
OBE episodes	29	.11	0.11		

FULL SAMPLE					
TOTAL MONTHS	**N**	**r**	**Fisher's z**	**z**	p
OBE days	34	.41*	0.44	0.41	0.682
OBE episodes	34	.32	0.33		

ZERO-PAIRS EXCLUDED					
TOTAL MONTHS	**N**	**r**	**Fisher's z**	**z**	p
OBE days	31	.38*	0.39	0.34	0.704
OBE episodes	31	.29	0.30		

*p<.05, **p<.01

OBE: Objective Bulimic Episode; SBE: Subjective Bulimic Episode

Table 25. Significance Testing: OBEs versus SBEs versus Total Binges Reported in Month 1

FULL SAMPLE					
Days	**N**	**r**	**Fisher's z**	**z**	**p**
OBE days	34	.54**	0.60	1.37	0.170
SBE days	34	.25	0.26		
OBE days	34	.54**	0.60	0.52	0.603
Total days	34	.44**	0.47		
SBE days	34	.25	0.26	-0.85	0.393
Total days	34	.44**	0.47		

ZERO-PAIRS EXCLUDED					
Days	**N**	**r**	**Fisher's z**	**z**	**p**
OBE days	21	.41	0.44	0.93	0.354
SBE days	29	.15	0.15		
OBE days	21	.41	0.44	0.27	0.790
Total days	29	.34	0.35		
SBE days	29	.15	0.15	-0.73	0.464
Total days	29	.34	0.35		

FULL SAMPLE					
Episodes	**N**	**r**	**Fisher's z**	**z**	**p**
OBE episodes	34	.49**	0.54	0.85	0.396
SBE episodes	34	.31	0.32		
OBE episodes	34	.49**	0.54	0.10	0.919
Total episodes	34	.47**	0.51		
SBE episodes	34	.31	0.32	-0.75	0.456
Total episodes	34	.47**	0.51		

ZERO-PAIRS EXCLUDED					
Episodes	**N**	**r**	**Fisher's z**	**z**	**p**
OBE episodes	21	.35	0.37	0.43	0.669
SBE episodes	29	.23	0.23		
OBE episodes	21	.35	0.37	-0.11	0.910
Total episodes	29	.38*	0.40		
SBE episodes	29	.23	0.23	-0.60	0.550
Total episodes	29	.38*	0.40		

*p<.05, **p<.01

OBE: Objective Bulimic Episode; SBE: Subjective Bulimic Episode

Table 26. Correlation Matrix for the EDE and Related Constructs in Month 1

OBE DAYS					
	EDE	**DFR**	**BSQ**	**IDS-SR**	**RSE**
EDE	1.00	.54**	.17	.28	.19
DFR	.54*	1.00	-.05	.04	.09

OBE EPISODES					
	EDE	**DFR**	**BSQ**	**IDS-SR**	**RSE**
EDE	1.00	.49**	.19	.27	.22
DFR	.49*	1.00	-.08	.01	.08

SBE DAYS					
	EDE	**DFR**	**BSQ**	**IDS-SR**	**RSE**
EDE	1.00	.25	.05	.31	.29
DFR	.25	1.00	.24	.09	.05

SBE EPISODES					
	EDE	**DFR**	**BSQ**	**IDS-SR**	**RSE**
EDE	1.00	.31	.07	.32	.28
DFR	.31	1.00	.33	.18	.15

TOTAL DAYS					
	EDE	**DFR**	**BSQ**	**IDS-SR**	**RSE**
EDE	1.00	.44**	.12	.38*	.33
DFR	.44**	1.00	.17	.09	.07

TOTAL EPISODES					
	EDE	**DFR**	**BSQ**	**IDS-SR**	**RSE**
EDE	1.00	.47**	.14	.40*	.34
DFR	.47**	1.00	.25	.15	.15

*p<.05, **p<.01

EDE: Eating Disorder Examination; DFR: Daily Food Record; OBE: Objective Bulimic Episode; SBE: Subjective Bulimic Episode; BSQ: Body Shape Questionnaire; IDS-SR: Inventory for Depressive Symptomatology-Self-Report ; RSE: Rosenberg Self-Esteem Scale

Table 27. Discriminant Validity of the EDE

OBE DAYS					
Month 1	**N**	**r**	**Fisher's z**	**z**	**p**
EDE & DFR	34	.54	0.60	1.70	0.091
EDE & BSQ	34	.17	0.17		
EDE & DFR	34	.54	0.60	1.25	0.210
EDE & IDS-SR	34	.28	0.29		
EDE & DFR	34	.54	0.60	1.62	0.109
EDE & RSE	34	.19	0.19		

OBE EPISODES					
Month 1	**N**	**r**	**Fisher's z**	**z**	**p**
EDE & DFR	34	.49	0.54	1.35	0.184
EDE & BSQ	34	.19	0.19		
EDE & DFR	34	.49	0.54	1.02	0.322
EDE & IDS-SR	34	.27	0.28		
EDE & DFR	34	.49	0.54	1.23	0.225
EDE & RSE	34	.22	0.22		

SBE DAYS					
Month 1	**N**	**r**	**Fisher's z**	**z**	**p**
EDE & DFR	34	.25	0.26	0.81	0.407
EDE & BSQ	34	.05	0.0500		
EDE & DFR	34	.25	0.26	-0.26	0.821
EDE & IDS-SR	34	.31	0.32		
EDE & DFR	34	.25	0.26	-0.17	0.868
EDE & RSE	34	.29	0.30		

SBE EPISODES					
Month 1	**N**	**r**	**Fisher's z**	**z**	**p**
EDE & DFR	34	.31	0.32	0.99	0.333
EDE & BSQ	34	.07	0.07		
EDE & DFR	34	.31	0.32	-0.04	0.948
EDE & IDS-SR	34	.32	0.33		
EDE & DFR	34	.31	0.32	0.13	0.901
EDE & RSE	34	.28	0.29		

Total DAYS					
Month 1	**N**	**r**	**Fisher's z**	**z**	**p**
EDE & DFR	34	.44	0.47	1.38	0.173
EDE & BSQ	34	.12	0.12		
EDE & DFR	34	.44	0.47	0.28	0.784
EDE & IDS-SR	34	.38	0.40		
EDE & DFR	34	.44	0.47	0.51	0.614
EDE & RSE	34	.33	0.34		

Total EPISODES					
Month 1	**N**	**r**	**Fisher's z**	**z**	**p**
EDE & DFR	34	.47	0.51	1.45	0.158
EDE & BSQ	34	.14	0.14		
EDE & DFR	34	.47	0.51	0.34	0.746
EDE & IDS-SR	34	.40	0.42		
EDE & DFR	34	.47	0.51	0.43	0.547
EDE & RSE	34	.34	0.40		

EDE: Eating Disorder Examination; DFR: Daily Food Record; OBE: Objective Bulimic Episode; SBE: Subjective Bulimic Episode; BSQ: Body Shape Questionnaire; IDS-SR: Inventory for Depressive Symptomatology-Self-Report ; RSE: Rosenberg Self-Esteem Scale

Table 28. Analysis of Contamination

OBE DAYS					
Month 1	**N**	**r**	**Fisher's z**	**z**	**p**
EDE & BSQ	34	.17	0.17	0.87	0.374
DFR & BSQ	34	-.05	-0.05		
EDE & IDS-SR	34	.28	0.29	0.98	0.884
DFR & IDS-SR	34	.04	0.04		
EDE & RSE	34	.19	0.19	0.44	0.676
DFR & RSE	34	.09	0.08		

OBE EPISODES					
Month 1	**N**	**r**	**Fisher's z**	**z**	**p**
EDE & BSQ	34	.19	0.19	1.07	0.287
DFR & BSQ	34	-.08	-0.08		
EDE & IDS-SR	34	.27	0.28	1.05	0.299
DFR & IDS-SR	34	.01	0.01		
EDE & RSE	34	.22	0.22	0.56	0.567
DFR & RSE	34	.08	0.08		

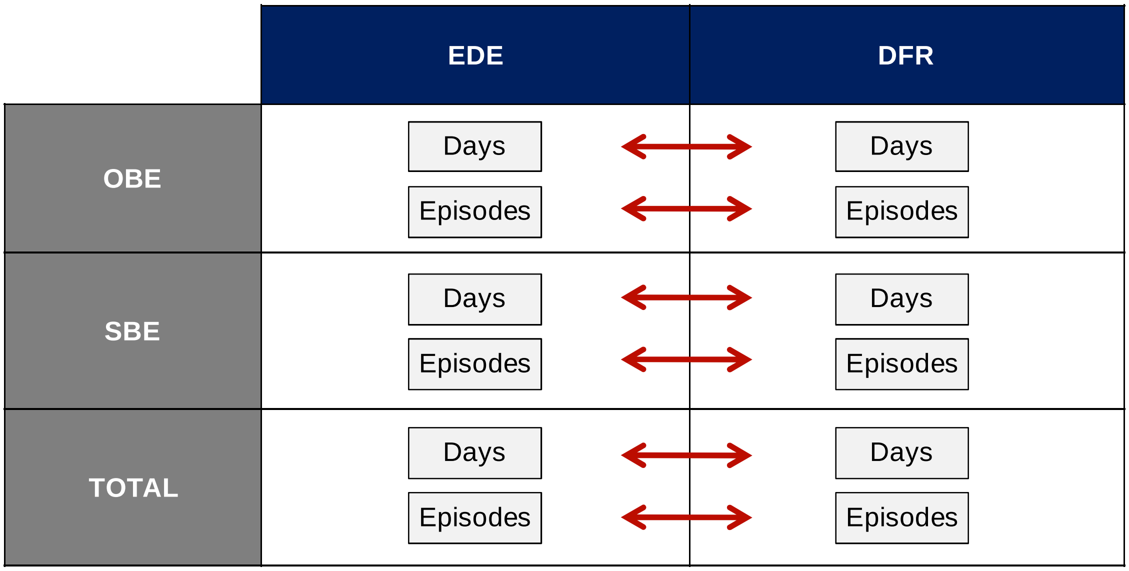
SBE DAYS					
Month 1	**N**	**r**	**Fisher's z**	**z**	**p**
EDE & BSQ	34	.05	0.05	-0.77	0.451
DFR & BSQ	34	.24	0.24		
EDE & IDS-SR	34	.31	0.32	0.91	0.374
DFR & IDS-SR	34	.09	0.09		
EDE & RSE	34	.29	0.30	0.98	0.320
DFR & RSE	34	.05	0.05		

SBE EPISODES					
Month 1	**N**	**r**	**Fisher's z**	**z**	**p**
EDE & BSQ	34	.07	0.07	-1.07	0.289
DFR & BSQ	34	.33	0.34		
EDE & IDS-SR	34	.32	0.33	0.59	0.544
DFR & IDS-SR	34	.18	0.18		
EDE & RSE	34	.28	0.29	0.54	0.586
DFR & RSE	34	.15	0.15		

TOTAL DAYS					
Month 1	**N**	**r**	**Fisher's z**	**z**	**p**
EDE & BSQ	34	.12	0.12	-0.20	0.860
DFR & BSQ	34	.17	0.17		
EDE & IDS-SR	34	.38	0.40	1.22	0.220
DFR & IDS-SR	34	.09	0.09		
EDE & RSE	34	.33	0.34	1.07	0.294
DFR & RSE	34	.07	0.07		

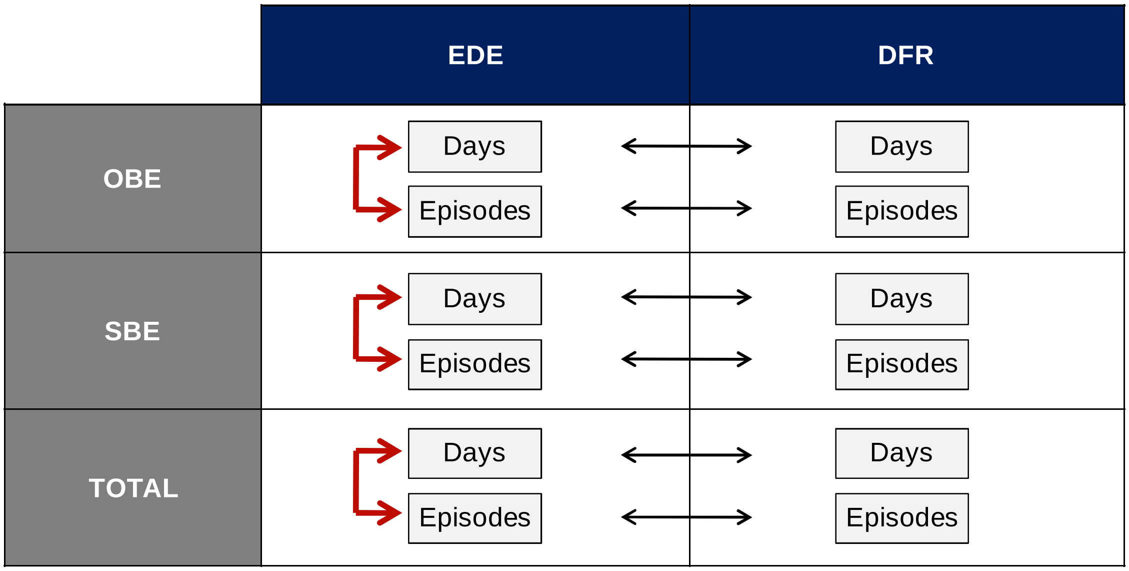
TOTAL EPISODES					
Month 1	**N**	**r**	**Fisher's z**	**z**	**p**
EDE & BSQ	34	.14	0.14	-0.45	0.673
DFR & BSQ	34	.25	0.26		
EDE & IDS-SR	34	.40	0.42	1.07	0.293
DFR & IDS-SR	34	.15	0.15		
EDE & RSE	34	.34	0.40	0.98	0.425
DFR & RSE	34	.15	0.15		

EDE: Eating Disorder Examination; DFR: Daily Food Record; OBE: Objective Bulimic Episode; SBE: Subjective Bulimic Episode; BSQ: Body Shape Questionnaire; IDS-SR: Inventory for Depressive Symptomatology-Self-Report ; RSE: Rosenberg Self-Esteem Scale



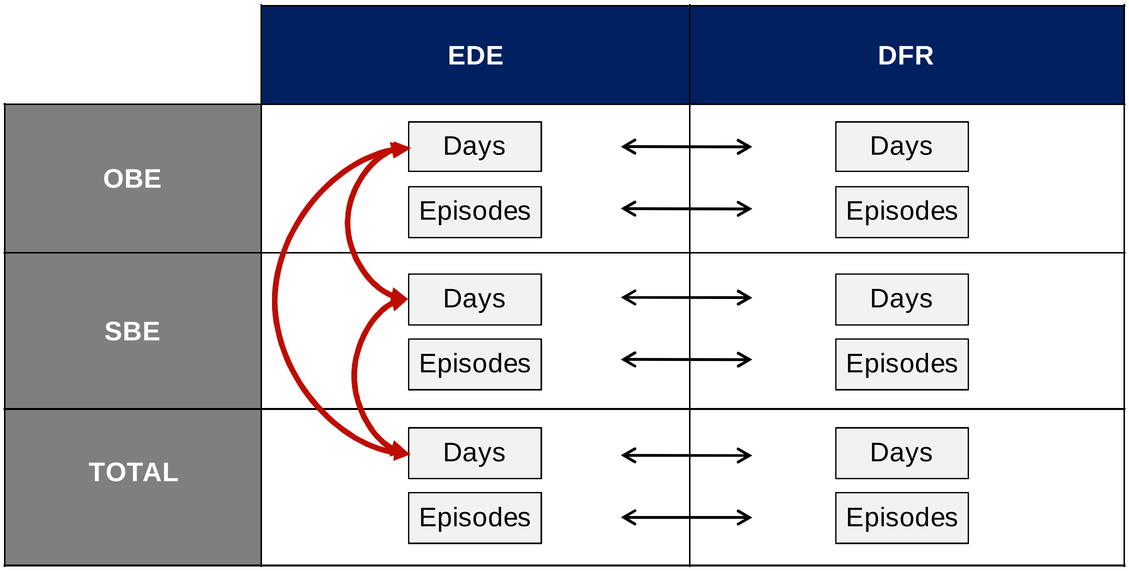
EDE: Eating Disorder Examination; DFR: Daily Food Records; OBE: Objective Bulimic Episodes; SBE: Subjective Bulimic Episodes

Figure 1. Comparison of EDE and DFR



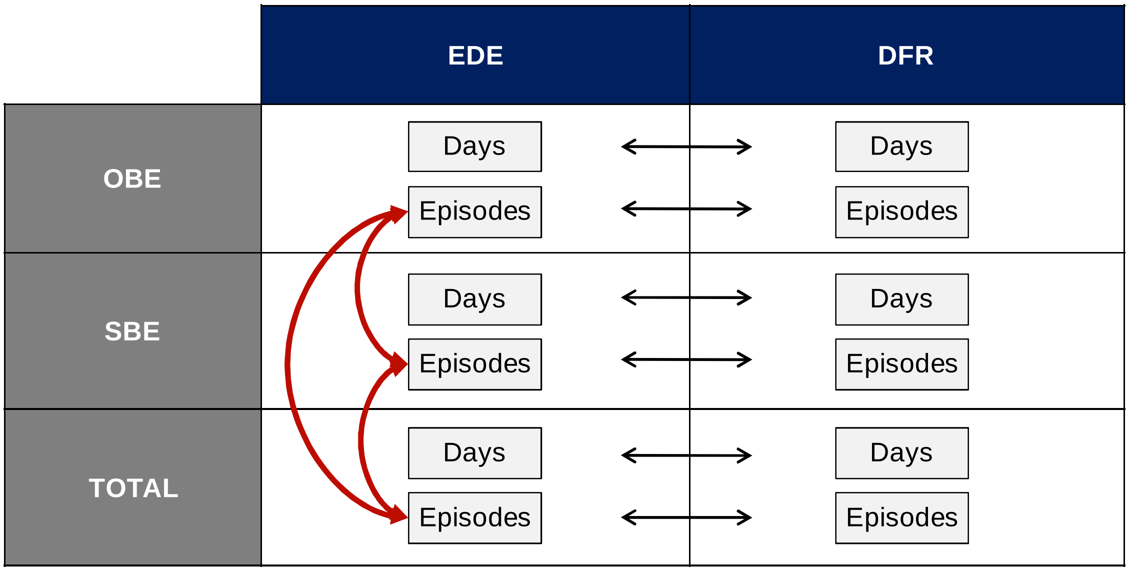
EDE: Eating Disorder Examination; DFR: Daily Food Records; OBE: Objective Bulimic Episodes; SBE: Subjective Bulimic Episodes

Figure 2. Significance Testing: Days versus Episodes



EDE: Eating Disorder Examination; DFR: Daily Food Records; OBE: Objective Bulimic Episodes; SBE: Subjective Bulimic Episodes

Figure 3. Significance Testing: OBE Days versus SBE Days versus Total Days



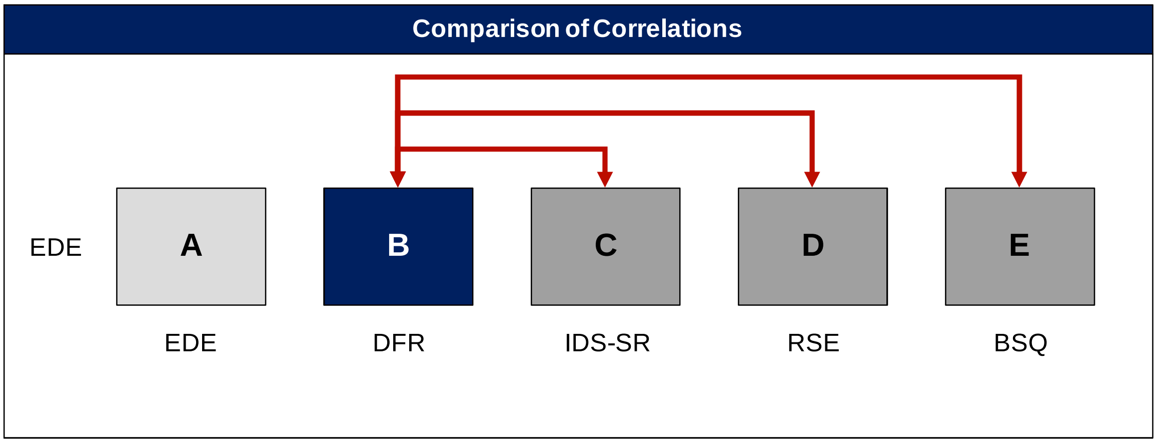
EDE: Eating Disorder Examination; DFR: Daily Food Records; OBE: Objective Bulimic Episodes; SBE: Subjective Bulimic Episodes

Figure 4. Significance Testing: OBE Episodes versus SBE Episodes versus Total Episodes

	EDE	DFR	IDS-SR	RSE	BSQ
EDE	A	B	C	D	E
DFR	F	G	H	I	J

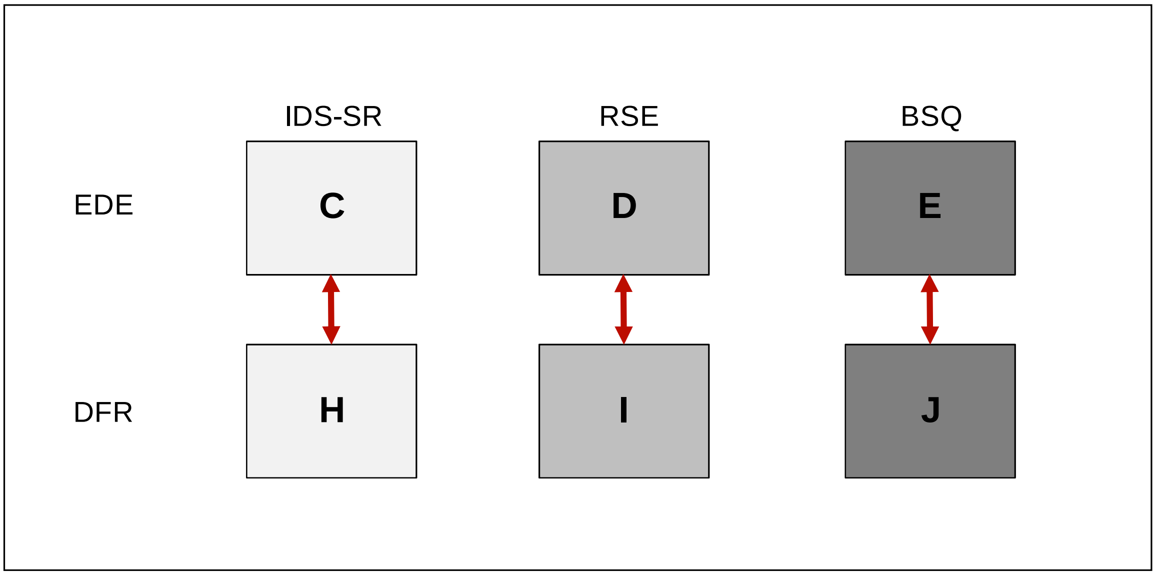
EDE: Eating Disorder Examination; DFR: Daily Food Records; IDS-SR: Inventory for Depressive Symptomatology-Self-Report; RSE: Rosenberg Self-Esteem Scale; BSQ: Body Shape Questionnaire

Figure 5. Construct Validity Correlation Matrix



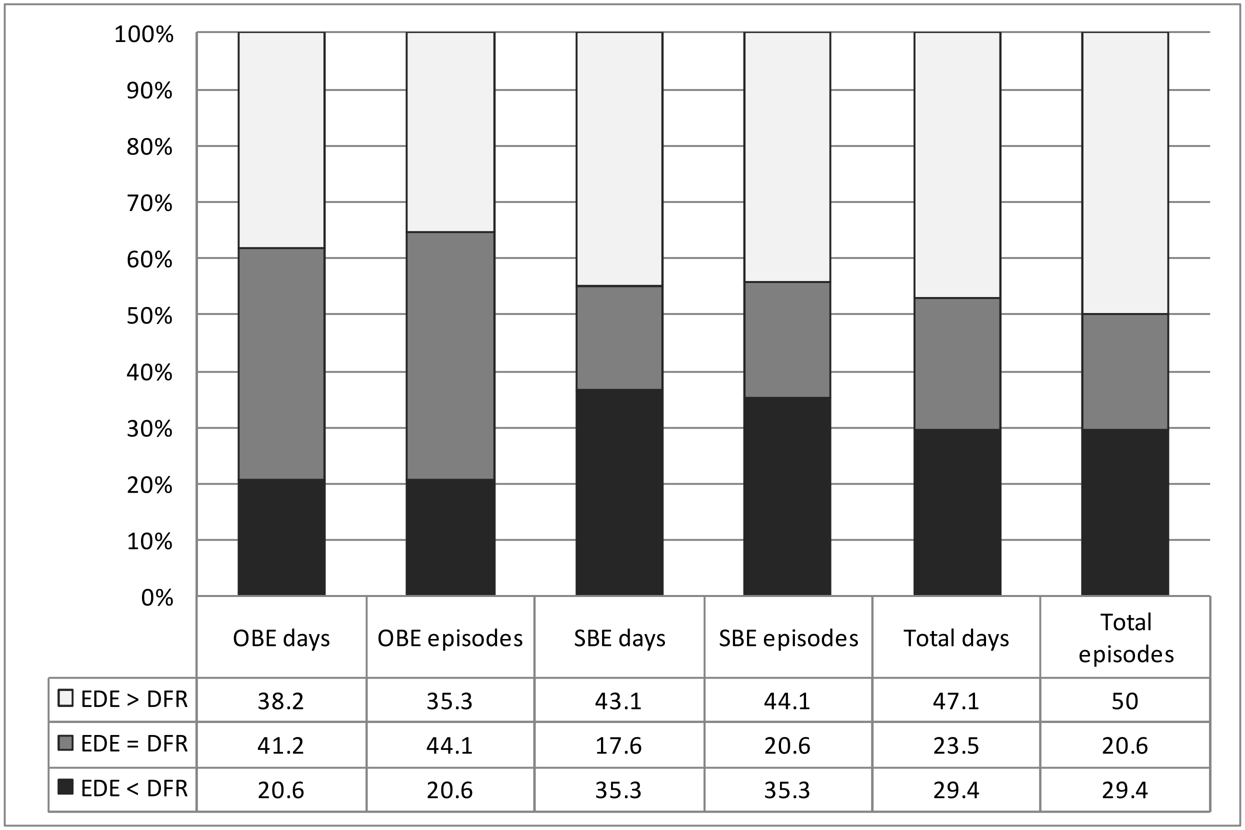
EDE: Eating Disorder Examination; DFR: Daily Food Records; IDS-SR: Inventory for Depressive Symptomatology-Self-Report; RSE: Rosenberg Self-Esteem Scale; BSQ: Body Shape Questionnaire

Figure 6. Discriminant Validity



EDE: Eating Disorder Examination; DFR: Daily Food Records; IDS-SR: Inventory for Depressive Symptomatology-Self-Report; RSE: Rosenberg Self-Esteem Scale; BSQ: Body Shape Questionnaire

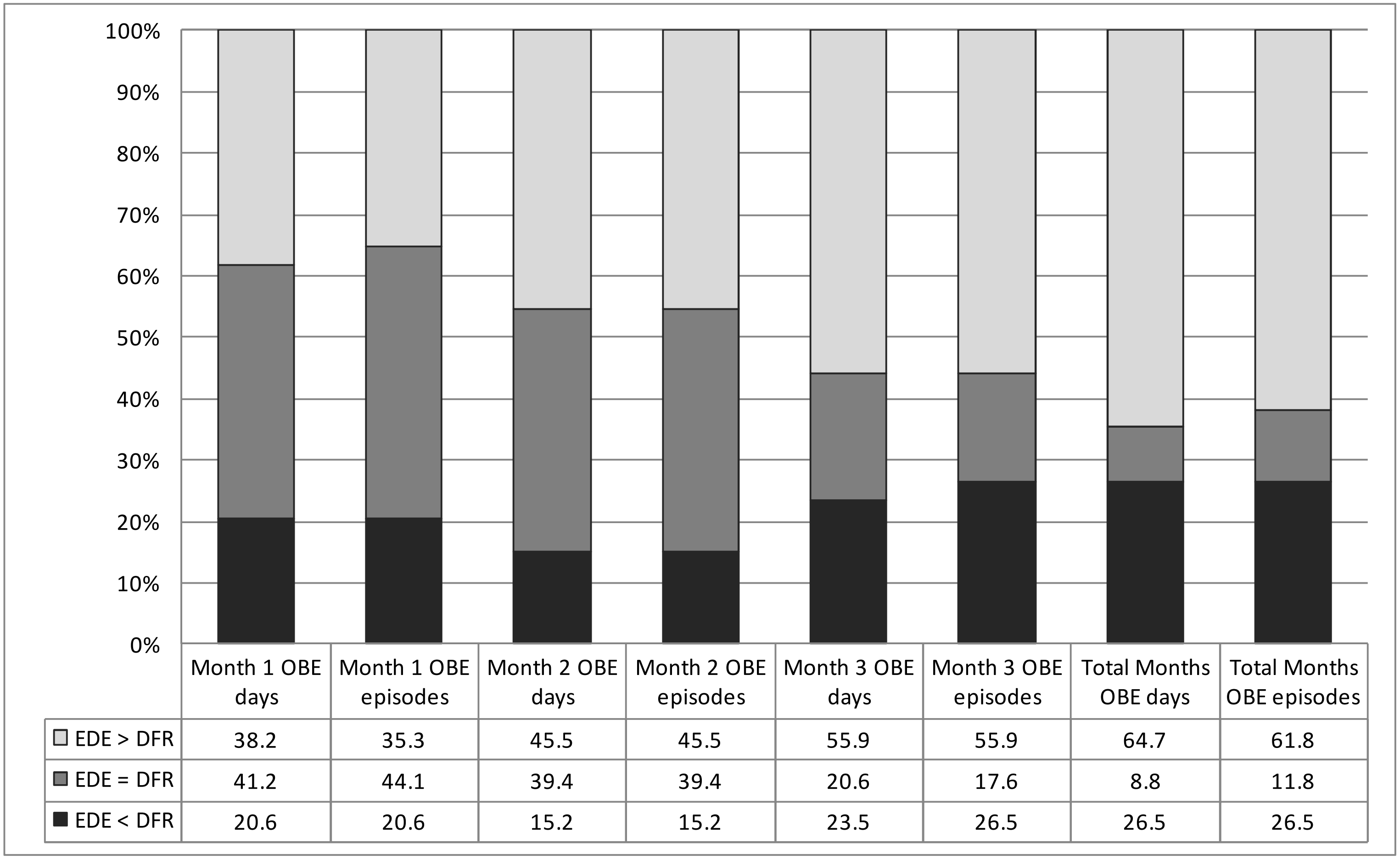
Figure 7. Analysis of Contamination



	OBE days	OBE episodes	SBE days	SBE episodes	Total days	Total episodes
□ EDE > DFR	38.2	35.3	43.1	44.1	47.1	50
▨ EDE = DFR	41.2	44.1	17.6	20.6	23.5	20.6
■ EDE < DFR	20.6	20.6	35.3	35.3	29.4	29.4

EDE: Eating Disorder Examination; DFR: Daily Food Records; OBE: Objective Bulimic Episodes; SBE: Subjective Bulimic Episodes

Figure 8. Individual Differences: OBEs, SBEs, and Total Binges in Month 1



	Month 1 OBE days	Month 1 OBE episodes	Month 2 OBE days	Month 2 OBE episodes	Month 3 OBE days	Month 3 OBE episodes	Total Months OBE days	Total Months OBE episodes
□ EDE > DFR	38.2	35.3	45.5	45.5	55.9	55.9	64.7	61.8
▨ EDE = DFR	41.2	44.1	39.4	39.4	20.6	17.6	8.8	11.8
■ EDE < DFR	20.6	20.6	15.2	15.2	23.5	26.5	26.5	26.5

EDE: Eating Disorder Examination; DFR: Daily Food Records; OBE: Objective Bulimic Episodes

Figure 9. Individual Differences: OBEs in Months 1-3

		DFR	
		OBEs ≥ Twice per Week	OBEs < Twice per Week
EDE	OBEs ≥ Twice per Week	1	4
	OBEs < Twice per Week	0	29

Sensitivity = 100.0%; Specificity = 87.9%
PPV = 20.0%; NPV = 100.0%

		DFR	
		OBEs ≥ Once per Week	OBEs < Once per Week
EDE	OBEs ≥ Once per Week	3	7
	OBEs < Once per Week	2	22

Sensitivity = 60.0%; Specificity = 76.9%
PPV = 30.0%; NPV = 91.7%

EDE: Eating Disorder Examination; DFR: Daily Food Records; OBE: Objective Bulimic Episodes; PPV: Positive Predictive Value; NPV: Negative Predictive Value

Figure 10. Analysis of Sensitivity, Specificity, PPV, and NPV for Month 1: OBEs Only

		DFR	
		Total ≥ Twice per Week	Total < Twice per Week
EDE	Total ≥ Twice per Week	8	6
	Total < Twice per Week	4	16

Sensitivity = 66.7%; Specificity = 72.7%
PPV = 57.0%; NPV = 80.0%

		DFR	
		Total ≥ Once per Week	Total < Once per Week
EDE	Total ≥ Once per Week	15	6
	OBEs < Once per Week	1	12

Sensitivity = 93.8%; Specificity = 66.7%
PPV = 71.4%; NPV = 92.3%

EDE: Eating Disorder Examination; DFR: Daily Food Records; PPV: Positive Predictive Value; NPV: Negative Predictive Value

Figure 11. Analysis of Sensitivity, Specificity, PPV, and NPV for Month 1: Total Episodes

		DFR	
		OBEs ≥ Twice per Week	OBEs < Twice per Week
EDE	OBEs ≥ Twice per Week	1	2
	OBEs < Twice per Week	1	30

Sensitivity = 50.0%; Specificity = 93.8%
PPV = 66.7%; NPV = 96.7%

		DFR	
		OBEs ≥ Once per Week	OBEs < Once per Week
EDE	OBEs ≥ Once per Week	1	13
	OBEs < Once per Week	2	18

Sensitivity = 33.3%; Specificity = 58.1%
PPV = 7.1%; NPV = 90.0%

EDE: Eating Disorder Examination; DFR: Daily Food Records; OBE: Objective Bulimic Episodes; PPV: Positive Predictive Value; NPV: Negative Predictive Value

Figure 12. Analysis of Sensitivity, Specificity, PPV, and NPV for Months 1-3: OBEs Only

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Appendix A

Empirical Findings on the Reliability of the EDE

Test-retest Reliability

Two research groups have examined the test-retest reliability of the EDE. One study assessed the short-term (2-7 days) test-retest reliability of the EDE in 20 female participants with a variety of eating disorders (Rizvi, Peterson, Crow, & Agras, 2000). The second reported on the test-retest reliability of the EDE over a longer period of time (6-14 days) in 18 adult women with BED (Grilo et al., 2003). Both studies found that the EDE demonstrates high test-retest reliability for the four subscales, with correlations ranging from .50 to .88. The EDE also demonstrated high test-retest reliability for OBEs and self-induced vomiting, with correlations ranging from .70 to .97. In contrast, the items that assess SBEs have not demonstrated significant test-retest reliability, with correlations ranging from .17 to .40. See Table 1 for additional detail. There have been no studies that have assessed the test-retest reliability of the EDE items that assess laxative misuse and diuretic misuse.

These data support the test-retest reliability of the four subscales, the individual items that assess objective bulimic days and episodes, and the individual items that assess self-induced vomiting days and episodes. However, the test-retest reliability correlations weakened as the length of time between testing increased, and it is notable that the time between testing was not long. The only exception to this was the Restraint subscale, for which the test-retest correlations remained high after a 2-week lag time. The data do not support the test-retest reliability of the items that assess subjective bulimic days and episodes. Additionally, it should be noted that both studies had small sample sizes which limit the generalizability of the findings.

Inter-rater Reliability of the EDE

Because the EDE is a semi-structured interview, it is important to examine whether raters are able to reliably make similar ratings. One study has examined the inter-rater reliability of each individual EDE item (Cooper & Fairburn, 1987). In this study, three different raters each assessed 12 different participants, nine of whom met criteria for BN and three of whom had no eating disorder. Of the 62 total items examined (some of which have since been eliminated from the EDE), 27 items had perfect inter-rater reliability and only three items had inter-rater reliability coefficients below .90. Only two of these three items are still included in the EDE: “social eating” and “body composition.” The third item, “pursuit of thinness,” is no longer included in the EDE. The results of this study support the inter-rater reliability of the individual items of the EDE.

Three studies have examined the inter-rater reliability of the four subscales of the EDE[3]. The first used a sample of 106 undergraduate females (Rosen, Vara, Wendt, & Leitenberg, 1990), the second sampled 20 adult females suffering from a variety of eating disorders (Rizvi et al., 2000), and, in the third, participants were 18 adult women with BED (Grilo et al., 2003). In all three studies, the inter-rater reliabilities of the Restraint subscale and Eating Concern subscale were .90 or greater. The inter-rater reliability

[3] Several studies have reported the inter-rater reliability coefficients for the EDE within the context of other studies (e.g., Masheb & Grilo, 2007); however, the inter-rater reliability of the EDE is not consistently reported in the literature. This summary only includes the three published studies whose purpose was to examine the inter-rater reliability of the EDE.

coefficients for the Shape Concern subscale ranged from .84 to .99 and the inter-rater reliability coefficients for the Weight Concern subscale ranged from .65 to .99 (See Table 2.)The lowest inter-rater reliability coefficients for the Shape Concern and Weight Concern subscales occurred in the Rosen et al. (1990) study, which was the earliest study and the only one that used a nonclinical sample.

These three studies also assessed the inter-rater reliability for the items related to binge eating and compensatory behaviors. In two of the studies, the inter-rater reliability for objective bulimic days, objective bulimic episodes, subjective bulimic days, and subjective bulimic episodes ranged from .91 to .99 (Grilo et al., 2003; Rizvi et al., 2000). In the third study, the inter-rater reliability was only calculated for the frequency of binge eating[4] and the frequency of self-induced vomiting (Rosen et al., 1990). These inter-rater reliability coefficients were .98 and .99, respectively. See Table 2 for additional detail. The results of these studies support the inter-rater reliability for the four subscales of the EDE and the individual items that assess binge eating and self-induced vomiting. No published studies have assessed the inter-rater reliability of the individual items that assess laxative misuse or diuretic misuse.

Internal Consistency

[4] Rosen et al. (1990) did not differentiate between Objective Bulimic Episode (OBEs) and Subjective Bulimic Episodes (SBEs) in their analyses. Although the authors do not provide the explicit criteria used to define “binge eating,” it is assumed that when the term “binge eating” is used, it is meant to describe what should be termed as OBEs. This assumption will be applied to all other studies cited in this paper that analyzed frequency of binge eating without distinguishing between OBEs and SBEs

Four studies[5] have examined the internal consistency of the four subscales of the EDE in six total samples (Beumont, Kopec-Schrader, Talbot, & Touyz, 1993; Byrne et al., in press; Cooper et al., 1989; Grilo et al., in press). The first study sampled an eating disorder population, specifically, 47 women with AN, 53 women with BN, and 42 controls (Cooper et al., 1989). Participants in the second study were 116 adult females suffering from various eating disorders (Beumont et al., 1993). Participants in the third study were 688 adults seeking treatment for BED (Grilo et al., in press). Finally, the fourth study (Byrne et al., in press), examined the internal consistency of the EDE subscales in three samples: a female eating disorder sample including 24 participants with AN, 67 with BN, and 67 with EDNOS, 317 women from a community sample, and 170 females seeking treatment for overweight or obesity.

The internal consistency coefficients of the subscales ranged from .58 to .78 for the Restraint subscale, .44 to .78 for the Eating Concern subscale, .68 to .85 for the Shape Concern subscale, and .51 to .76 for the Weight Concern subscale. A complete list of internal consistency coefficients can be found in Table 3. The highest internal consistency coefficients were found in the samples of women with full- and sub-threshold AN and BN whereas the lowest internal consistency coefficients were consistently found in either the community-based samples or the BED sample. The results of these studies provide support for the internal consistency of the Shape Concern subscale and preliminary support for the other three subscales. Internal consistency has not been

[5] The internal consistency of the EDE is rarely reported by authors who have used the EDE in their research; thus, only studies whose purpose was to examine the internal consistency of the EDE are summarized here.

assessed for the overeating section of the EDE or for self-induced vomiting because those assessments are based on only one item each.

Long Term Recall

Although research supports the test-retest reliability or repeatability of the EDE, this does not demonstrate whether individuals accurately recall past symptoms. The EDE asks individuals to recall symptoms that occurred up to 6 months prior to the interview, but there is little data to suggest that individuals are able to recall these symptoms accurately. Two studies have been conducted to assess longer-term recall accuracy of eating disorder symptoms using the EDE. In the first, 70 participants with a variety of eating disorders completed a first EDE at time 1 and a second EDE at either a 6 or 12 month follow-up assessment (Peterson, Miller, Johnson-Lind, Crow, & Thuras, 2007). During the second EDE, they were asked to recall symptoms from time 1 rather than current symptoms. The researchers found a strong correlation between OBE frequency at time 1 and recall (r=.72). However, the correlation between SBE frequency at time 1 and recall was significantly lower than the correlation for OBE frequency (r=.34, Z=2.95, p<.001). The researchers also compared the diagnoses based on the data collected at time 1 and at recall. They found agreement rates ranging from 65% to 86% for narrow (e.g., AN, BN, BED) and broad (e.g., full-threshold eating disorder, sub-threshold eating disorder) diagnoses, respectively.

A second group of researchers found similar results in a recall study (Ravaldi, Vannacci, Truglia, Zucchi, Mannucci, Rotella et al., 2004). They assessed 25 participants with a variety of eating disorders at two time points. At time 1, they were given the EDE to assess their current symptoms. Five to 30 months later, they were instructed to recall their symptoms at time 1 using the EDE. They found significant correlations between the subscale scores at baseline and recall, with correlations ranging from .63 to .88. They also found significant correlations between the bulimic behaviors reported at baseline and recall: OBE days (.69), OBE episodes (.65), SBE days (.74), SBE episodes (.76), self-induced vomiting (.79), laxative misuse (.85), diuretic misuse (.70), and excessive exercise (.97). The results of these two studies provide support for the hypothesis that participants are able to reliably recall their symptom presentation as far back as 2.5 years. However, it is important to note that these data only examined whether participants accurately recalled the symptoms they reported at the prior interview. These data do not indicate whether participants accurately recalled the frequency of symptoms actually experienced.

Appendix B

Empirical Findings on the Reliability of the EDE-Q

Test-Retest Reliability

The test-retest reliability of the EDE-Q has been examined by three groups of researchers, two of which assessed test-retest reliability over a relatively short duration (1-14 days; Luce & Crowther, 1999; Reas, Grilo, & Masheb, 2006) whereas the third assessed the test-retest reliability over a relatively longer duration (5-14 months; Mond, Hay, Rodgers, Owen, and Beumont, 2004a). In the first (Luce & Crowther, 1999), the test-retest reliability of the EDE-Q was examined in a community sample of 139 female undergraduate students whereas in the second (Reas et al., 2006), the test-retest reliability of the EDE-Q was also examined in a sample of 86 men and women seeking treatment for BED. In both studies (Luce & Crowther, 1999; Reas et al., 2006), the short-term test-retest correlations were significant for all four subscales with correlation coefficients ranging from .66 to .94. There were also significant test-retest correlations for the frequency of binge eating and compensatory behaviors with correlation coefficients ranging from .51 to .92. See Table 4 for a complete list of correlations. It is notable that the weakest correlations were for SBEs, OOEs, and diuretic misuse. The correlations for all four subscales were higher in the Luce and Crowther study, which is not surprising as the sample was composed of undergraduate women for whom eating disorder cognitions may not vary day to day.

One of these studies also analyzed the short-term test-retest reliability for the individual items that are used to create the four subscales (Reas et al., 2006). These correlations ranged from .40 (fear of weight gain) to .78 (importance of shape, reaction to prescribed weighing) and were all significant at *p*<.01. They also analyzed the test-retest correlations for different time lags: one day or less, two to 14 days, and 7 to 14 days (Reas et al., 2006). The results show that there was little impact of the time lag on the test-retest correlations for the EDE subscales or the OBE's. However, there was a time lag effect on the test-retest correlations for SBE's and OOE's, with the Spearman rho correlations decreasing as the time lag increased.

Longer term test-retest reliability of the EDE-Q was examined in a community sample of 196 Australian women (Mond et al., 2004a). The longer-term test-retest correlations for the four subscales remained high despite the lengthy time lag and were comparable to the short-term test-retest correlations found by Luce and Crowther (1999) and Reas et al. (2006). Additionally, the correlations between individual items rated at time 1 and time 2 were all significant, ranging from .42 (Eating in secret) to .69 (Feelings of fatness). There were also significant test-retest correlations for OBEs, SBEs, and excessive exercise; however they were weaker than the correlations for the EDE-Q subscales and the 2-week test-retest correlations for these behaviors found by Luce and Crowther (1999) and Reas et al. (2006). Additionally, when the analysis only included participants who reported eating disorder symptoms, the correlations for OBEs were lower than when the analysis included the entire sample. Thus, these data demonstrate that the inclusion of respondents who report no disordered eating behavior can artificially inflate the correlations between time 1 and time 2.

The data provide support for the short-term (1-14 days) test-retest reliability for the assessment of the four subscales, OBEs, self-induced vomiting, and laxative misuse as well as preliminary support for the assessment of SBEs, OOEs, and diuretic use. The EDE-Q also demonstrated long-term (5-14 months) test-retest reliability for the four subscales, but not OBEs, SBEs, or excessive exercise. Overall, these data suggest that the EDE-Q may be more reliable with regard to the assessment of cognitive symptoms than the behavioral symptoms, especially as the duration between testing sessions increases. However, researchers must also consider the possibility that the cognitive symptoms of eating disorders are more stable over time than the behavioral symptoms. Future research needs to examine the test-retest reliability for the EDE-Q in participants with AN, BN, and EDNOS diagnoses as well as more heterogeneous community samples.

Internal Consistency

There have been three studies that have assessed the internal consistency of the EDE-Q subscales. The samples of these three studies included a community sample of 203 undergraduate women at time 1 and 139 (68.5%) of the women at time 2 (Luce & Crowther, 1999), a community sample of 208 adult women (Mond et al., 2004a), and 203 adult women with BN (Peterson, Crosby, et al., 2007). The four subscales demonstrated acceptable internal consistency in all three studies (Luce & Crowther, 1999; Mond et al., 2004a; Peterson, Crosby, et al., 2007). All four subscales of the EDE-Q demonstrated acceptable internal consistency, with correlations ranging from .70 to .93 (see Table 5 for a complete list of internal consistency coefficients). One study also calculated the item-total correlations for the EDE-Q (Mond et al., 2004a) and found correlations ranging from .33 (“avoidance of eating,” “eating in secret”) to .76 (“dissatisfaction with weight,” “dissatisfaction with shape”). These data indicate that the EDE-Q demonstrates good internal consistency in both community samples of adult women and adult women with BN. There has been no research on the internal consistency of the items on the EDE-Q that assess specific behaviors because those items are typically analyzed as individual items. Future studies should examine the internal consistency of the EDE-Q in both men and women, adolescents, and patients with AN, BED, and EDNOS.

Appendix C

Theoretical Perspectives on Validity

Face validity

Face validity is the extent to which an instrument appears to measure what it purports to measure. In other words, an instrument has face validity if the instrument includes items that are assumed to be relevant to the construct of interest. The face validity of an instrument is determined by a subjective judgment. For example, the EDE, an assessment of eating disorder symptoms, may be judged to have face validity if it included items that assess symptoms assumed to be relevant to eating disorders such as food restriction, binge eating, purging, and importance of shape and weight. However, it should be noted that face validity is neither necessary nor sufficient for an instrument to be a valid assessment of a particular construct because instruments may have high construct, content, or criterion-related validity without appearing to measure the given construct

Content validity

Content validity is the extent to which an instrument assesses the entire domain of the construct it purports to measure. For example, the EDE purports to measure eating disorder symptoms in general and includes items that assess both behavioral and cognitive symptoms of eating disorders. If the EDE only assessed the behavioral symptoms of eating disorders, the content validity of the EDE as an assessment of general eating disorder symptoms would not be supported because the cognitive symptoms would not be assessed. One of the most common ways to determine whether an instrument demonstrates content validity is to poll experts as to the essentiality of each item to the instrument (Lawshe, 1975). These responses are then used to determine the Content Validity Ratio (CVR), which is equivalent to (number of panelists indicating "essential" – (total number of panelists/2) / (total number of panelists/2). It should be noted that the content validity of an instrument can only be determined to the extent that the domain of the construct is understood. In other words, if the definition or domain of a construct changed, then the content validity of an instrument would change. For example, if it was determined that affect is also essential to eating disorder symptomatology, the EDE would not demonstrate content validity because it does not assess affect.

Criterion-oriented validity

Criterion-oriented validity refers to the extent to which the operationalization of a given construct (i.e., predictor) is able to predict a criterion of interest (i.e., criterion) that is either measured at the same time (concurrent validity) or at some point in the future (predictive validity). Concurrent validity is often studied to determine whether the instrument in question could be used to measure the criterion in place of another instrument. To measure concurrent validity, the predictor and criterion are measured at the same time and correlated. For example, the EDE is purported to predict current diagnostic status. Thus, to examine the concurrent validity of the EDE with regard to diagnostic status, one could administer the EDE and a separate diagnostic interview on the same day. If the EDE performed well against the diagnostic interview, the EDE could be used in place of the diagnostic interview.

Predictive validity, on the other hand, is used if one is interested in predicting a criterion in the future. It is examined by measuring the criterion at some point in time after the predictor has been assessed and correlating the two. For example, one might want to know whether EDE scores predict diagnostic status after treatment. In this case, the EDE would be administered prior to treatment and a diagnostic interview would be administered post-treatment. If EDE scores pre-treatment are related to diagnostic status post-treatment, the EDE would demonstrate predictive validity and could be used to predict treatment response. However, it should be noted that the criterion-oriented validity of an instrument is useful only in so far as the criteria used are valid themselves. Thus, with regard to examining the concurrent validity of the EDE using the diagnostic criteria for various eating disorders as the criterion, the validity estimate of the EDE will only be as valid as the diagnostic criteria used.

Construct Validity

The construct validity of an instrument refers to the degree to which an instrument operationalizes a specific construct. In other words, construct validity is the extent to which the scores on the instrument reflect the desired construct rather than other constructs. A construct is operationalized by placing it within a nomological network. A nomological network describes the theoretical relationships between the abstract constructs, the observable manifestations of the abstract constructs, and the proposed empirical relationships between the observable manifestations of the abstract constructs. The construct validity of an instrument is supported if the actual empirical relationships between observable manifestations of constructs reflect the proposed empirical relationships between observable manifestations of constructs. Failure of the empirical relationships between observables to reflect proposed relationships between observables may indicate a limitation of the instrument to measure the construct. However, it may also indicate an error in the nomological network itself. Thus, the construct validation of an instrument cannot be determined by a single study. Rather, construct validation is a process by which the nomological network of a construct is tested. The most important tests of the nomological network are reflected in the assessment of the convergent and discriminant validity of an instrument. Convergent validity is the extent to which the construct of interest is empirically related to theoretically-related constructs whereas, discriminant validity is the extent to which the construct of interest is empirically unrelated to theoretically-unrelated constructs.

The gold standard for measuring convergent and discriminant validity is the Multitrait-Multimethod (MTMM) matrix (Campbell & Fiske, 1959). In MTMM, multiple traits (often 3) are measured by multiple methods (often 3; e.g., paper and pencil, interview, direct observation). This allows one to compare correlations between assessments of similar constructs to the correlations between assessments of dissimilar constructs. The MTMM matrix also allows for the comparison of correlations between assessments using similar methods and correlations between assessments using dissimilar methods. The MTMM matrices include four different types of correlations: Monotrait-Monomethod (MTMM), Monotrait-Heteromethod (MTHM), Heterotrait-Monomethod (HTMM), and Heterotrait-Heteromethod (HTHM). The MTMM correlations represent the instrument’s correlation with itself and could reflect test-retest reliability if participants have been assessed at multiple time points. The MTHM correlations represent the correlations between instruments that measure the same construct using different methods of assessment. The HTMM correlations represent the correlations between different traits using the same method. Finally, the HTHM correlations reflect the correlations between the assessments of different traits using different methods, so we would expect these correlations to be the lowest in the matrix

If the MTHM correlations are significantly different from zero, the relationships between these scores are due to overlap in the construct that is being assessed. Significant HTMM correlations indicate that the relationship between scores is the result of overlap in the method of measurement. The HTHM correlations are expected to be the lowest correlations in the matrix because there is no overlap with regard to either the construct being assessed or the method of measurement. Thus, significant HTHM correlations may indicate significant amounts of error. If the MTHM correlations are higher than the HTMM and HTHM correlations, the relationship between similar constructs measured by different methods is stronger than the relationship between different constructs measured by the similar methods and the relationship between different constructs measured by different methods. In other words, if the MTHM correlations are significantly higher than the HTMM and HTHM correlations, there is evidence for convergent and discriminant validity.

Appendix D

Empirical Findings on the Validity of the EDE

Criterion-oriented validity: Concurrent validity of the EDE with regard to current diagnostic status

In a seminal article on establishing validity, Cronbach and Meehl (1955) explained that one method for testing criterion-oriented validity is to determine whether the instrument predicts expected group differences. Four studies have examined the ability of the EDE to discriminate between eating disorder populations and control groups (Cooper et al., 1989; Rosen et al., 1990; Wilfley, Schwartz, Spurrell, & Fairburn, 2000; Wilson & Smith, 1989). In the first of these studies (Cooper et al., 1989), the EDE scores of 47 women with AN, 53 women with BN, and 42 women who did not have an eating disorder were compared. Two studies have examined the EDE's ability to discriminate between women with BN and control women who score highly on a measure of restraint (Rosen et al., 1990; Wilson & Smith, 1989). The final study compared 105 adult women with BED to a group of 42 normal-weight and 15 overweight women without eating disorders (Wilfley et al., 2000).

Data from these studies show that there were large effect sizes for the four subscales between the following groups: AN group and Control group, BN group and Control group, BN group and Restricting Control Group, BED group and Normal Weight Control group, and a BED group and an Overweight Control group (range of Cohen's d = .97 to 6.68). The only exceptions were a moderate effect size (.40) between a BN and Restricting Control group on the Restraint subscale and a small effect size (.16) between the BED and Overweight Control group on the Restraint subscale. Additionally, the EDE also demonstrated ability to discriminate between AN and BN samples on Shape Concern, Weight Concern, and frequency of OBEs (Cooper et al, 1989). These statistics are provided in Table 6[6].

One limitation of these data worth noting is that it is unclear from the description of the Cooper et al. (1989) study whether the assessors were blind to the participants' diagnostic status. Based on their percent of Ideal Body Weight (IBW), the women with AN weighed much less than the women with BN or the control women (73.4 IBW, 103.3 IBW, 99.9 IBW respectively); thus, the assessors would likely be aware of the diagnostic status of the participants with AN. As such, assessor knowledge of diagnostic status may limit the validity of these results. Despite this potential limitation, the EDE appears to discriminate between women with eating disorders and control women, even when the control women report high restraint.

Construct validity: Convergent validity of the EDE and assessments of similar constructs

One method of testing construct validity is to determine whether two different measures of a construct converge. Cronbach and Meehl (1955) state, "If two tests are presumed to measure the same construct, a correlation between them is predicted (p. 286)." Two studies[7] have assessed the convergent validity of the EDE's four subscales against measures of similar constructs (see Table 7), one of which used a sample of 106

[6] The results from Rosen et al. (1990) are not included in the table as the authors only described the results of the group differences comparisons within text and did not report statistics from these comparisons.

[7] Additional studies have examined the convergent validity of the EDE and self-report questionnaires of eating disorder symptoms (e.g., Greeno, Marcus, & Wing, 1995) as well as the convergent validity of the EDE and other interview-based assessments (e.g., Wade, Tiggemann, Martin, & Heath, 1997); however the purpose of these studies has been to examine the validity of the other instrument against the EDE. These studies are not reported here as it does not seem suitable to discuss the psychometric properties of the EDE against unvalidated instruments.

undergraduate females (Rosen et al., 1990) whereas the other used a sample of 82 women seeking treatment for BN (Loeb et al.,1994). In both studies, all four subscales of the EDE correlate with measures of similar constructs. Specifically, the Restraint subscale was negatively correlated with behavioral measures of food consumption (e.g., frequency of regular meals; Rosen et al., 1990) and positively correlated with other indices of restraint (e.g., the Restraint subscale of the Three-Factor Eating Questionnaire; Loeb et al., 1994). Likewise, the Eating Concern subscale correlated with behavioral measures of disordered eating (e.g., frequency of binge eating; Rosen et al., 1990) as well as cognitive assessments of eating concern (e.g., Dieting Concern subscale of the Eating Attitudes Test; Loeb et al., 1994). The Shape Concern and Weight Concern subscales were both significantly correlated with other indices of body dissatisfaction (e.g., Body Shape Questionnaire; Loeb et al., 1994; Rosen et al., 1990). The majority of these correlations demonstrate a medium to large effect, but it should be noted that although significant, the correlations between the Restraint subscale and two similar constructs (the frequency of eating snack foods and the EAT Oral Control subscale) demonstrated only a small effect. A detailed summary of these statistics is provided in Table 7. In sum, research has demonstrated that the subscales of the EDE correlate with instruments of similar constructs.

Construct validity: Factor structure of the EDE

Finally, three studies[8] have examined the factor structure of the EDE (Byrne et al., in press; Grilo et al., in press; Mannucci, Ricca, Di Bernardo, Moretti, Cabras, & Rotella, 1997). As stated previously, the EDE is conceptualized as having four subscales: Restraint, Weight Concern, Shape Concern, and Weight Concern. However, none of these studies replicated the EDE's four-factor model. A more recent study examined the factor structure of the EDE in a sample of 688 adults seeking treatment for BED (Grilo et al., in press). The exploratory factor analysis suggested a 3-factor model (i.e., "Dietary Restraint," "Shape/Weight Overevaluation," and "Body Dissatisfaction") and this model was supported by the confirmatory factor analysis. A second factor analysis using 115 obese adults who did not meet criteria for BED indicated a 2-factor model (Mannucci et al., 1997). In this study, the first factor was similar to the Restraint subscale whereas the other appeared to be a combination of the remaining three subscales. The third study examined the factor structure in a sample of 158 adolescent and adult women with eating disorders, 170 adult women seeking treatment for obesity, and 317 control women (Byrne et al., in press). When the original four-factor structure of the EDE was compared to three-, two-, and one-factor models, a one-factor model (i.e., Weight and Shape Concern) was the best fit. Though the results from the three studies were inconsistent, it should be noted that all three studies failed to discriminate between a Shape Concern factor and a Weight Concern factor. It is notable that there was little overlap in the type of samples used. Thus, additional data are needed to determine whether different factor structures exist among participants with different symptom presentations.

[8] A fourth study examined the factor structure of a version of the EDE adapted for use with children (Wade, Byrne, Bryant-Waugh, 2008). As this review primarily pertains to the adult version of the EDE, the Wade et al. (2008) study will not be discussed.

Appendix E

Empirical Findings on the Validity of the EDE-Q

Criterion-oriented validity: Concurrent validity of the EDE-Q with regard to current diagnostic status

Four studies have been conducted to test the criterion-oriented validity of the EDE-Q by examining its ability to discriminate between eating disorder and control groups (Elder, Grilo, Masheb, Rothschild, Burke-Martindale, & Brody, 2006; Engelsen & Laberg, 2000; Mond, Hay, Rodgers, Owen, & Beumont, 2004b; Wilson, Nonas, & Rosenblum, 1993). Only one of these studies used a structured interview to classify participants as cases or noncases of eating disorders (Mond et al., 2004b). In this study, 182 adult women without an eating disorder were compared to 13 women diagnosed with BN nonpurging type and EDNOS. The results indicated that women with eating disorders scored significantly higher on the EDE-Q than women who did not meet criteria for eating disorders.

Two additional studies classified eating disorder cases and non-cases using the EDE-Q (Engelsen & Laberg, 2000; Wilson et al., 1993). The first study demonstrated that obese binge eaters (N=31) scored significantly higher than obese non-binge eaters on 15 individual items of the EDE-Q (Wilson et al., 1993). The items that did not discriminate between the two groups were items that reflected dietary restraint and a desire to lose weight. It is worth noting that the entire sample in this study was drawn from a weight loss program and as such, one may not expect differences between groups on these variables. The second study found that adolescents with AN (N=10) scored significantly higher on the Eating Disorders Inventory (EDI; Garner, Olmsted, & Polivy, 1983) and all but one subscale of the 12-item version of the Eating Attitudes Test (EAT-12; Garner, & Garfinkel, 1979), with effect sizes ranging from .87 to 1.56.

Finally, one study has examined the agreement between the EDE-Q and another self-report measure of binge eating in identifying regular binge eaters (Elder et al., 2006). In this study, the researchers examined the concordance between the EDE-Q and the Questionnaire on Eating and Weight Patterns-Revised (QEWP-R; Spitzer, Yanovski, & Marcus, 1993) in self-identified binge eaters among 249 adult bariatric surgery candidates. When binge eating was defined as having at least 1 episode of binge eating per week, approximately the same number of participants were classified as binge eaters by the EDE-Q (20.7%) and QEWP-R (23.2%). Although the EDE-Q and QEWP-R identified a similar number of binge eaters, the agreement between those measures was low (Cohen’s kappa = .26). When binge eating was defined as having at least 2 binge episodes per week, the QEWP-R identified 1.5 times as many binge eaters as did the EDE-Q (13.9% and 8.9%, respectively) and the instruments were only in agreement about 4 potential binge eaters (Cohen’s kappa = .05). This kappa value indicates that the agreement between the EDE-Q and QEWP-R in identifying twice-weekly binge eaters is almost entirely due to chance. It should be noted that both assessments used were self-report questionnaires and it is unclear whether the discrepancy between the measures is a limitation of the EDE-Q, a limitation of the QEWP-R, or a limitation of both. Also, because “diagnostic status” was solely based on reported binge eating frequency, this study highlights the difficulty in assessing binge eating and the importance of using additional criteria to determine diagnostic status

Overall, the data from the first two studies provide support for the use of the EDE-Q in distinguishing cases and non-cases of eating disorders. However, it is important to note that only one study used a structured interview to diagnose eating disorder cases. Additionally, the eating disorder samples were small in all four studies ranging which limits the generalizability of the findings.

Construct Validity: Convergent validity of the EDE-Q compared to daily food records.

Two studies have examined the convergent validity of the EDE-Q against daily food records (Grilo et al., 2001a; Grilo, Masheb, & Wilson, 2001b). Both studies asked participants to record the number of OBE, SBE, and OOE episodes they experienced each day for 28 days and then to complete an EDE-Q at the end of the monitoring period. Sixty-six participants in the first study (Grilo et al., 2001a) and 37 participants in the second study (Grilo et al., 2001b) completed the prospective daily self-monitoring and EDE-Q. In both studies, there were significant correlations between the daily self-monitoring and EDE-Q for the number of OBE episodes and SBE episodes reported; there was a significant correlation between the daily self-monitoring and EDE-Q for OOE episodes in the second study as well. There were no significant differences between the number of OBE episodes reported on the daily self-monitoring and EDE-Q in either the first (d = .08) or second studies (d = .08). However, participants reported significantly higher numbers of SBE episodes on the daily self-monitoring in both the first (d = .53) and second (d = .60) studies. Likewise, participants reported significantly more OOE episodes on the daily self-monitoring in both the first (d = 1.13) and second (d = .75) studies. These data do demonstrate additional support for the convergent validity of the EDE-Q in assessing OBE episodes in adults with BED. However, it should be noted the participants in both studies were given definitions for OBE, SBE, and OOE and were asked to simply record the number of episodes they had had for each type of episode. Because participants were classifying their eating episodes on both instruments, the concordance between these two measures may be artificially inflated. Additionally, because clinical interviewers did not classify eating episodes as OBE, SBE, or OOE episodes, it is impossible to know whether the eating episodes were accurately coded by the participants.

Construct Validity: Factor Structure of the EDE-Q

Two studies have examined the factor structure of the EDE-Q (Hrbabosky et al., 2008; Peterson, Crosby, et al., 2007). In the first study (Peterson, Crosby, et al., 2007), an exploratory factor analysis was conducted on EDE-Q data collected from 203 adults with full- and sub-threshold BN in an attempt to replicate the factors of the EDE-Q. The results supported a four-factor model. The first factor appeared to be a combination of the Shape Concern and Weight Concern subscales and included eight items from these subscales. The second factor appeared to be an approximation of the Eating Concern subscale, including all of the items from the Eating Concern subscale, the preoccupation with shape and weight question from the Shape Concern and Weight Concern subscales, and the empty stomach question from the Restraint subscale. The third subscale was an approximation of the Restraint subscale and included the remaining items from the Restraint subscale as well as the fear of weight gain question from the Shape Concern subscale. Finally, the fourth subscale consisted solely of the two questions about importance of shape and weight from the Shape Concern and Weight Concern subscales.

A second study (Hrabosky et al., 2008) examined the factor structure of the EDE-Q using exploratory and confirmatory factor analysis in a sample of 337 adult obese bariatric surgery candidates. The results indicate that the first factor consisted of items assessing overeating or binge eating and appeared to describe general disturbances in eating behavior. The second factor consisted of items from the Shape and Weight Concern subscales and was described by the authors as a general Appearance Concern factor. The third factor appeared to be an approximation of the Restraint subscale and included three items from the original subscale. The final factor replicated the findings from the Peterson, Crosby, et al. (2007) study and included only the overevaluation of shape and weight items.

These data provide moderate support for the construct validity of the Eating Concern and Restraint subscales in adult women with full and sub-threshold BN. There was also moderate support for the Restraint subscale in bariatric surgery candidates. It is notable that most of the questions from the Shape Concern and Weight Concern subscales load onto a single factor, which suggests that separating shape and weight may not be a meaningful distinction for many people. Finally, the data suggest that the importance of shape and weight represent a distinct construct and are not necessarily related to body dissatisfaction, discomfort with body exposure, or desire to change one’s body shape and weight.

Appendix F

Empirical Findings on the Convergent Validity of the EDE and EDE-Q

Although the EDE is considered the “gold standard” of eating disorder assessment, it requires significant amounts of time to administer as well as intensive assessor training. A questionnaire version of the EDE, the Eating Disorder Examination-Questionnaire (EDE-Q), was developed to address these limitations (Fairburn & Beglin, 1994). The EDE-Q includes 41 questions that are meant to address the same constructs assessed in the interview version. Respondents rate these questions on the same 7-point Likert scale used in the EDE. Many of the questions posed by the EDE and EDE-Q are worded exactly the same; however, there are slight variations in wording for some of the questions. For example, to determine the extent to which a participant would be distressed by regular self-weighing, the EDE asks, “Over the past four weeks, how would you have felt if you had been asked to weigh yourself once each week for the following four weeks, no more often and no less often?” whereas the EDE-Q queries, “How much would it upset you if you had to weigh yourself once a week for the next four weeks?” Additionally, the EDE allows the interviewer to ask additional questions prior to making the final rating. Thus, although the EDE and EDE-Q were meant to assess the same constructs, differences in wording and method of delivery may limit the extent to which the two instruments converge.

Moreover, it is unclear which delivery method, interview or self-report, is more accurate. Although interview-based instruments are generally considered superior, some argue that interviews may be shaming and prone to respondent denial or minimization of symptoms (e.g., Grilo, 2005). The self-report instruments may be more accurate representations of a person's symptoms because admitting to symptoms on a questionnaire would be less likely to induce shame or embarrassment than admitting these symptoms to another person. Thus, although it is important to examine whether the EDE-Q displays convergent validity with regard to the EDE, it is just as important to understand whether the EDE displays convergent validity with regard to the EDE-Q.

There have been 15 studies and 18 comparisons[9] that have assessed the convergent validity of the EDE and EDE-Q (Binford et al., 2005; Black & Wilson, 1996; Carter et al., 2001; de Zwaan et al., 2004; Fairburn & Beglin, 1994; Goldfein et al., 2005; Grilo et al., 2001a; Grilo et al., 2001b; Kalarchian et al., 2000; Mond et al., 2004b; Passi et al., 2003; Sysko, Walsh, & Fairburn, 2005; Sysko, Walsh, Schebendach, et al., 2005; Wilfley et al., 1997; Wolk et al., 2005). The following provides a qualitative summary of these studies. The majority of these studies have assessed convergent validity using correlations between the EDE and EDE-Q, comparison of means, and determining the percentage of respondents whose scores on the EDE and EDE-Q were within one point of each other. The majority of these studies assessed the convergent validity of the EDE and EDE-Q with regard to the four subscales and OBE's. Less than half assessed the convergent validity of the EDE and EDE-Q with regard to compensatory behaviors or SBE's. Researchers have assessed convergent validity in a number of different subsamples: 4 studies used participants with AN (Binford et al., 2005; Passi et al., 2003;

[9] The Binford et al. (2005) study conducted three separate analyses in three different subsamples: participants with AN, participants with BN, and participants with EDNOS. The Fairburn and Beglin (1994) study also conducted separate analyses, one in a community sample and the other in a mixed group of participants with either AN or BN.

Wolk et al., 2005), 3 studies used participants with BN (Binford et al., 2005; Carter et al., 2001; Sysko, Walsh, & Fairburn, 2005), 1 study used a combined AN and BN sample (Fairburn & Beglin, 1994), 1 study assessed an EDNOS sample (Binford et al., 2005), 4 studies examined BED samples (Goldfein et al., 2005; Grilo et al., 2001a; Grilo et al., 2001b; Wilfley et al., 1997), 2 studies assessed bariatric surgery patients (de Zwaan et al., 2004; Kalarchian et al., 2000), 2 studies used community samples (Fairburn & Beglin, 1994; Mond et al, 2004b), and one study assessed the convergent validity of the EDE and EDE-Q in substance users (Black & Wilson, 1996).

Overall, there is strong support for the convergent validity of the four subscales of the EDE-Q. Table 8 summarizes the results of the 14 published comparisons of the EDE and EDE-Q with regard to the Restraint subscale. Of all four subscales, the Restraint subscale showed the strongest convergent validity with significant positive correlations between the EDE and EDE-Q in 13 of the 14 comparisons[10]. These correlations ranged from .35 to .85 (mean r = .68). Additionally, the majority of participants' EDE Restraint scores were within one point of their EDE-Q Restraint score (range: 54% to 81%). In 14 of the 15 comparisons, participants scored higher on the EDE-Q than the EDE (Binford et al., 2005; Black & Wilson, 1996; de Zwaan et al., 2004; Fairburn & Beglin, 1994; Grilo et al., 2001a; Grilo et al., 2001b; Kalarchian et al., 2000; Mond et al., 2004b; Passi et al., 2003; Sysko, Walsh, Schebendach, et al., 2005; Wilfley et al., 1997; Wolk et al., 2005). However, these differences only reached statistical significance in the BED patients, community samples, and the bariatric surgery patients

[10] One study did not calculate the correlation between the EDE and EDE-Q Restraint scores (Sysko, Walsh, Schebendach, et al., 2005).

(de Zwaan et al., 2004; Fairburn & Beglin, 1994; Grilo et al., 2001a; Grilo et al., 2001b; Kalarchian et al., 2000; Mond et al., 2004b; Wilfley et al., 1997) with one exception in a BN sample (Binford et al., 2005).

There was also strong support for the convergent validity of the Eating Concern subscale of the EDE and EDE-Q (see Table 9). There were 14 comparisons of the EDE and EDE-Q for the Eating Concern subscale (Binford et al., 2005; de Zwaan et al., 2004; Fairburn & Beglin, 1994; Grilo et al., 2001a; Grilo et al., 2001b; Kalarchian et al., 2000; Mond et al., 2004b; Passi et al., 2003; Sysko, Walsh, Schebendach, et al., 2005; Wilfley et al., 1997; Wolk et al., 2005) and all found significant correlations between the two measures[11]. However, there was variability in the strength of these correlations, with correlations ranging from .33 to .94 (mean r = .67). There was additional variability in the percent of participants who reported Eating Concern scores on the EDE that were within one point of their EDE-Q score (range: 30% - 96%). In all 14 comparisons, participants scored higher on the EDE-Q than the EDE for the Eating Concern subscale and 9 of these comparisons reached statistical significance[12].

A review of the literature also provides strong support for the convergent validity of the EDE and EDE-Q with regard to the Shape Concern subscale; however, there was more variability in the validity statistics for this subscale (see Table 10). For the Shape Concern subscale, there were 15 comparisons between the EDE and EDE-Q, of

[11] One study did not provide correlations between the EDE and EDE-Q for the Eating Concern subscale (Fairburn & Beglin, 1994).

[12] Two studies did not analyze the mean differences between the EDE and EDE-Q for the Eating Concern subscale (Fairburn & Beglin, 1994; Sysko, Walsh, Schebendach, et al., 2005).

which 14 out of 15 found significant correlations between the two measures[13]. These correlations ranged from .42 to .91 (mean r = .75). Of note, 80% of the correlations ranged from .69 to .85. In all cases, between 49% and 75% of participants reported Shape Concern scores on the EDE within one point of their EDE-Q score. Finally, in 14 of the 15 comparisons, participants scored higher on the EDE-Q than the EDE and this difference reached statistical significance in 11 studies[14].

The results of 15 comparisons also support the convergent validity of the EDE and EDE-Q with regard to the Weight Concern subscale. This information is summarized in Table 11. The statistical support was slightly weaker for the Weight Concern subscale than the Restraint subscale, but there was slightly less variance in the validity statistics for the Weight Concern subscale than the Shape Concern subscale. All 14 studies that calculated the correlation between the EDE and EDE-Q scores found significant correlations between the two measures which ranged between .54 and .88 (mean r = .75). In all cases, at least 56% of participants' Weight Concern scores on the EDE were within one point of their EDE-Q score. Finally, in 14 of the 15 comparisons, participants scored higher on the EDE-Q than the EDE for the Weight Concern subscale and 13 of these reached statistical significance[15].

Overall, the data from 15 comparisons of the EDE and EDE-Q provide limited support for the convergent validity of the EDE and EDE-Q in assessing rates of OBE's

[13] Sysko, Walsh, Schebendach, et al. (2005) did not calculate the correlation between the EDE and EDE-Q for the Shape Concern subscale.

[14] Sysko, Walsh, Schebendach, et al. (2005) did not analyze whether there was a significant difference between the two instruments for the Shape Concern subscale.

[15] Sysko, Walsh, Schebendach, et al. (2005) did not analyze whether there was a significant difference between the two instruments for the Weight Concern subscale

(see Table 12). The most consistent aspect of the data was the inconsistency of the results. First, of the 15 comparisons, 10 assessed the concordance for OBE episodes whereas the remaining 5 assessed the concordance for OBE days. Second, of the 15 comparisons between the EDE and EDE-Q, 13 found significant correlations between the EDE and EDE-Q for rates of OBE's. However, there were large discrepancies among these correlations, which ranged from .28 to .92 (mean r = .51). The correlations were lowest for the BED samples, with correlations ranging from .20 to .29. Third, of the 15 comparisons between the EDE and EDE-Q, 8 studies found significant differences between the EDE and EDE-Q whereas the remaining 7 did not. Of the 8 studies that found significant differences, 5 studies found that participants reported higher rates of OBE's on the EDE whereas 3 found that participants reported higher rates of OBE's on the EDE-Q. Altogether, 9 comparisons found that participants reported higher rates of OBE's on the EDE whereas 6 reported higher rates on the EDE-Q. Of note, 4 of the 5 studies that compared OBE days found that participants reported higher rates on the EDE-Q. In contrast, 8 of the 10 studies that compared OBE episodes found that participants reported higher rates on the EDE. However, it is important to note that for many of these studies, the differences between the EDE and EDE-Q did not reach statistical significance.

There have been nine published comparisons of the EDE and EDE-Q in assessing the frequency of SBE episodes. This information is summarized in Table 13. In these studies, the correlations between the EDE and EDE-Q ranged from -.09 to .78 (mean r = .40) and six of the eight correlations were significant. However, it should be noted that the sample size of the study that reported the largest correlation (.78) was only 7 (Mond et al., 2004b). Only two of the eight comparisons found significant differences between the number of SBE episodes reported on the EDE and EDE-Q; however, the lack of significance may have been a power issue as few participants reported SBEs. Only two comparisons found that participants reported more SBE episodes on the EDE-Q than the EDE (de Zwaan et al., 2004; Grilo et al., 2001b) and these differences did not reach statistical significance. Overall, the data on the convergent validity of the EDE and EDE-Q in assessing SBE episodes is inconsistent at best. However, this may be because the construct itself is difficult to conceptualize rather than a limitation of the instruments.

There have been nine comparisons of the EDE and the EDE-Q for compensatory behaviors (e.g., self-induced vomiting, laxative use). Refer to Table 14 for summary. The correlations between the EDE and EDE-Q for these behaviors were significant and high, with most ranging from .88 to 1.0 (mean r = .87). In two studies, there was a significant difference between the EDE and EDE-Q for self-induced vomiting, one in which participants reported more episodes on the EDE (Carter et al., 2001) and one in which participants reported more episodes on the EDE-Q (Fairburn & Beglin, 1994). There was only one study that found a significant difference between the EDE and EDE-Q for laxative use (Sysko, Walsh, & Fairburn, 2005). Overall, there was support for the convergent validity of the EDE and EDE-Q in assessing self-induced vomiting and laxative use. However, it should be noted that these behaviors were not common in several of the studies; thus, it is possible that the concordance between the two measures may be slightly inflated. There have been no published studies on the convergent validity between the EDE and EDE-Q for diuretic misuse, fasting, or excessive exercise.