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**Differentiating Anorexia Nervosa, Bulimia Nervosa,
and Binge Eating Disorder using the PAI and EDI-2**

Submitted by

Natalie Demidenko, B.A.

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment

of the requirements for the degree of

Master of Arts

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PAI and the EDI-2

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Natalie Demidenko

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Abstract

Individuals with Anorexia Nervosa-restricting type (AN-R), Anorexia Nervosa-binge-purge type (AN-B), Bulimia Nervosa-purging type (BN), and Binge Eating Disorder (BED) were differentiated using the discriminant analysis approach on the Personality Assessment Inventory (PAI) and the Eating Disorder Inventory-2 (EDI-2). 173 women referred to a Centre for the Treatment of Eating Disorders were sampled. Results supported the distinction of BED as a separate diagnosis, with lower scores for this group compared to other groups on general psychopathology, but higher scores for the BED group compared to PAI and EDI-2 norms. Higher EDI-2 scores separated AN groups from other groups on AN-related symptomatology, whereas higher EDI-2 scores separated AN-B, BN, and BED from AN-R on binge eating symptoms. As predicted, borderline personality features, risk-taking features, and negative impression management were higher in AN-B and BN than AN-R and BED. Both AN groups displayed higher obsessive-compulsive traits than BN and BED groups. Treatment implications were discussed.

DIFFERENTIATING ANOREXIA NERVOSA, BULIMIA NERVOSA, AND BINGE EATING DISORDER USING THE PAI AND EDI-2

Introduction

Diagnoses of eating disorders have steadily increased since the 1960s (Gordon, 1990), leading researchers to describe and characterize eating disordered behaviours in a systematic fashion. One research goal has been to gain a clearer understanding of the differences among the various disorders. These disorders include two subtypes of Anorexia Nervosa, restricting type (AN-R) and binge/purge type (AN-B), Bulimia Nervosa-purging type (BN), and more recently, a provisional diagnosis of Binge Eating Disorder (BED) (APA, 1994). By distinguishing these disorders from one another, treatment can be improved and specialized to focus on the principle concerns and challenges that each disorder brings forward.

The aim of the present study is to differentiate among the above four diagnostic groups of eating disordered patients. The data were collected on 173 patients from the Regional Centre for the Treatment of Eating Disorders at the Ottawa Hospital (General Campus). The Centre sees up to six individuals per week for consultation, diagnosis, and psychological testing. The full scale and subscale scores of the Personality Assessment Inventory (PAI; Morey, 1991) and the Eating Disorders Inventory-2 (EDI-2; Garner, 1991) are used to determine which measures best separate the eating disorder categories. Particular attention is focused on the diagnosis of BED, given that very little research has been done on the links between it and certain personality traits (Yanovski, 1993). Second, given that BED is a new and highly controversial diagnosis (deZwaan, 1997), the

issue of whether it may be considered a separate and distinct disorder is explored in the present study.

Diagnostic Categories of Eating Disorders

The DSM-IV (APA, 1994) identifies two forms of AN, restricting (AN-R) and binge/purge type (AN-B), as well as two forms of BN, purging type and nonpurging type. The DSM-IV criteria for AN requires a refusal to maintain body weight at or above a minimally normal weight for age and height (15% below normal or a BMI of ≤ 17.5), an intense fear of gaining weight or becoming fat, disturbance in the way in which one's body weight or shape is experienced, and amenorrhea in postmenarcheal females (APA, 1994). The restricting form of this disorder includes the above, but is absent of episodes of binge eating or purging behaviour. The binge eating/purging type of AN, involves the individual engaging in binge-eating or purging behaviour, such as the use of laxatives or self-induced vomiting. These divisions for AN were created based on a number of clinical observations showing these groups to be quite distinct both clinically and in terms of personality traits (Dennis & Sansone, 1997). For example, individuals with AN-B have been seen to possess many of the same borderline personality disorder features as those diagnosed with BN-purging type (Piran, Lerner, Garfinkel, Kennedy, & Brouillette, 1988) although they maintain a body weight that is much lower (APA, 1994). These distinctions will be further addressed in the following sections.

BN is also subdivided into two types (APA, 1994). The general criteria for BN includes recurrent episodes of binge eating, recurrent inappropriate compensatory behaviour in order to prevent weight gain, "bingeing" and "purging" in combination, at least twice a week for three months, and finally self-evaluation that is excessively

influenced by body shape and weight, all occurring independent of episodes of AN (APA, 1994). BN-purging type involves a current episode of BN in which the individual regularly engages in self-induced vomiting or the misuse of laxatives, diuretics, or enemas (APA, 1994). The nonpurging type of BN occurs when the individual is in a current episode of BN, but uses other inappropriate compensatory behaviours, such as excessive exercise or fasting, but does not regularly engage in the purging behaviours mentioned above. The present study does not consider those with the diagnosis of BN-nonpurging type, due to a lack of available subjects with the BN-nonpurging diagnosis.

The DSM-IV (APA, 1994) has included draft criteria for BED in Appendix B of the manual. To be diagnosed with BED, recurrent episodes of binge eating must be present. The bingeing involves an unusually large amount of food that is eaten in a discrete period of time, and includes feelings of loss of control. At least three of the following elements are associated with the binge: eating more rapidly than normal, eating until feeling uncomfortably full, eating large amounts of food when not physically hungry, eating alone or in secret because of feeling of embarrassment, and feeling disgusted, depressed, and guilty after the binge. The remaining criteria include marked distress regarding the binge, the occurrence of binge episodes at least two days per week, for a minimum of six months, and finally, the individual must not qualify for AN or BN.

The BED Controversy

In the past decade, the literature on BED has grown considerably, and large community based studies have reported prevalence rates for BED between 2% and 5% (Bruce & Agras, 1992; Spitzer, Devlin, Walsh, Hasin, Wing, Marcus, et al., 1992). The exact prevalence of BED is not known, however some have found that approximately

30% of those participating in weight loss programs and 70% of individuals in Overeaters Anonymous display BED (deZwaan, 1997). Like the AN and BN, BED is also more common among women than men, but more men are diagnosed with BED (65 % female, 35 % male) than with BN (90% female, 10% male) (deZwaan, 1997).

Other researchers (Brody, Walsh, & Devlin, 1994) have observed that 20% to 40% of individuals in treatment for weight control meet criteria for BED. Research also suggests that the severity of binge eating is associated with the degree of being overweight (Bruce & Agras, 1992; Telch, Agras, & Rossiter, 1988).

The addition of BED to the DSM-IV represents a recent, yet controversial, shift to examining binge eating as a distinct disorder, with its own etiology, symptomatology, and treatment considerations. Before its inclusion in the DSM-IV, BED was not considered a separate diagnosable disorder but rather it was subsumed within the BN (nonpurging subtype) or within Eating Disorders Not Otherwise Specified (EDNOS) diagnoses. Some authors (Marcus, 1993; Spitzer et al., 1992) studied samples of individuals with binge eating tendencies, who were also morbidly obese¹ to further understand the mechanisms underlying binge eating without purging. When studying obese and non-purging BN populations, some researchers (Marcus, 1993; McCann, Rossiter, King, & Agras, 1991; Rossiter, Agras, Telch, & Bruce, 1992; Spitzer et al., 1992) found that at least 8 % of these obese individuals also met the criteria for BED (Bruce & Agras, 1992).

¹ Prior to the use of the term BED (around 1991), terms such as “obese binge eaters”, or “morbidly obese subjects with binge eating characteristics” were used to describe individuals (mostly obese) who engaged in repeated binge eating without using compensatory mechanisms. These terms are intended to be synonymous with each other for the purposes of this research.

When BED was first discussed as a potential disorder, some authors suggested that it was a less severe form of BN, or BN in partial remission (McCann & Agras, 1990). Some patients with BED also had a history of purging behaviour and the diagnosis of BED does not preclude the presence of some sub-criteria purging behaviour (Marcus, 1993).

There is good evidence that obese individuals with BED have higher levels of comorbid psychopathology and eating pathology than non-binge eating obese individuals (Yanovski et al., 1993). Moreover, there is some evidence that individuals with BED appear less psychologically disturbed in general compared to BN groups (Hay & Fairburn, 1998). Some (Striegel-Moore, Wilson, Wilfley, Elder, & Brownell, 1998) have suggested a continuum of BED, with no clear demarcation between full syndrome and sub-threshold syndromes. Fairburn and Wilson (1993) have suggested that it is simply too early to indicate whether BED may be a distinct disorder. They suggest that more research is needed to clarify BED's classification as a distinct disorder, and that its hasty inclusion in the DSM as a separate disorder may trivialize the notion of mental illness and diagnosis.

Thus far, several factors have been isolated to support BED as different from other eating disorder groups. First, preliminary research has indicated that more men experience BED than experience BN or AN, making the gender gap between men and women with the disorder smaller than it is for BN and AN (Yanovski et al., 1993). Second, those with BED tend to have an earlier age of onset of binge eating behaviour than patients with BN (Raymond, Mussell, Mitchell, de Zwaan, & Crosby, 1995; Yanovski, 1993). Third, there is evidence to suggest that those who develop BED differ

from those who develop AN or BN in that individuals with BED frequently report the onset of binge eating in the absence of prior dietary restraint or weight loss (Spurrell, Wilfley, Tanofsky, & Brownell, 1997). In fact, about half of the patients with BED first start binge eating in the absence of dieting behaviours (deZwaan, 1997). Finally, the course of BED has been described as chronic (Spitzer, Yanovski, Wadden, Wing, Marcus et al., 1993) with prolonged periods without binge eating being rare. These findings suggest that BED may be a distinct and separate eating disorder category. However, more research is needed to isolate specific differences. Thus, preliminary research on BED has suggested that obese individuals, including those with BED, make up a heterogeneous population, and suggests the existence of a distinct clinical subset of obese individuals, those with BED.

The following sections review some of the literature on AN-R, AN-B, BN, and BED. A clinical description of each eating disorder is presented, followed by differences in general psychopathology and eating disorder symptomatology in the AN-B, BN, and AN-R groups. Empirical research regarding each disorder and associated personality traits and eating disorder symptoms is then explored. Based on the clinical impressions of these disorders in the literature, specific hypotheses suggested by the literature are presented. AN-R is reviewed first, followed by AN-B and BN, and ending with BED.

Clinical Descriptions of Psychopathology in AN-R

The AN-R has been linked with Cluster C personality features, namely avoidant, obsessive-compulsive, and dependent personality characteristics (Dennis & Sansone, 1997). The DSM-IV (APA, 1994) outlines criteria used to assess the presence of obsessive-compulsive personality disorder as the following: preoccupation with details,

rules, schedules, and organization; perfectionism that interferes with task completion; excessive devotion to work; overconscientious and inflexibility regarding matters of morality, ethics, or values; unable to discard worthless objects; insist others submit to their way of doing things; miserly in spending on self and others; and finally, shows rigidity and stubbornness. Thus, interpersonal relationships of those with obsessive-compulsive traits have been described as strained due to their inflexibility and rigidity (Davison & Neale, 1996).

Individuals with AN-R, historically have been described as socially introverted and self-conscious, rigid in their thinking, extremely perfectionistic, and self-sacrificing as a function of their very low self-esteem and asceticism (Garfinkel & Garner, 1982). Referring to the typical individual with restricting AN, DuBois (1949) wrote, "...she is a tense, hyperactive, alert, rigid person. ...She is inordinately ambitious, drives herself hard, is markedly sensitive, and obviously feels insecure. An immature and severe conscience guides her actions and she is said to be hyperconscientious. Neatness, meticulousness, and a mulish stubbornness not amenable to reason make her a rank perfectionist..."(In Vitousek & Manke, 1994,p. 109).

Thus, symptoms like perfectionism, cognitive rigidity, social introversion, passivity, need for order and symmetry, and affective overcontrol (obsessive-compulsive or Cluster C traits) are all linked to AN-R. There is also a deficit in these individuals' ability to identify and understand their own affective and physiological cues [i. e. also referred to as a lack of interoceptive awareness] (Garfinkel & Garner, 1982). Moreover, it is typical for these individuals to be very demanding of themselves in all areas of their

lives, creating a great personal burden that often may translate into prolonged feelings of depression and helplessness.

It is interesting that the subtypes of AN were not divided in the DSM until the 1994 edition. AN-B is currently described as being quite distinct from AN-R in terms of personality traits and clinical symptomatology (Fairburn & Wilson, 1993), despite being subsumed under the diagnosis of AN due to low weight. Weight and physical symptomatology aside, the description of AN-B and BN regarding personality is very similar and so these two groups are described together.

Clinical Descriptions of Psychopathology in AN-B and BN

Many authors have associated BN and AN-B with personality features that are consistent with borderline and histrionic personality pathologies (Cluster B; Bossert-Zaudig, Zaudig, Junker, Weigand, & Krieg, 1993; Dowson, 1992; Rossiter, Agras, Telch, & Schneider, 1993). In fact, borderline personality disorder has been documented in approximately 1 out of every 3 individuals with BN or AN-B (Dennis & Sansone, 1997), making borderline personality disorder a fairly common comorbid disorder among these populations. The actual prevalence rates of borderline personality disorder vary greatly and depend on the respective population that is sampled.

The DSM-IV (APA, 1994) identifies the following criteria for assessing the presence of borderline personality disorder: frantic efforts to avoid real or imagined abandonment; a pattern of unstable and intense interpersonal relationships; identity disturbances; impulsivity; recurrent suicidal behaviour; affective instability; chronic feelings of emptiness; inappropriate, intense anger or difficulty controlling anger; and transient stress-related paranoid ideation or severe dissociative symptoms. As a result,

those with borderline disorder characteristics tend to be overemotional and extremely sensitive, have marked dependence and idealization of others, fear abandonment by others, and sometimes experience multiple suicide attempts.

Clinical Descriptions of Psychopathology in BED

Knowledge about personality characteristics and traits involved in BED is still at the rudimentary stage. Binge eating appears to be related to a number of pathological symptoms, most commonly depression and affective instability (Kolotkin, Revis, Kirkley, & Janick, 1987; Yanovski et al., 1993). Moreover, individuals with BED report a high frequency of negative automatic thoughts commonly seen in patients suffering from depression (deZwaan, 1997). Others have described increased impulsivity (deZwaan, Mitchell, Seim, Specker, Pyle, et al., 1994) and anger (Fichter, Quadflieg, & Brandl, 1993) in BED samples.

Since its inclusion in one of the DSM-IV appendices, some researchers (Striegel-Moore et al., 1998) have tried to understand better the differences between BED and obesity or overeating. They have suggested that lower self-esteem, greater negative affect, more dissatisfaction with weight, and a greater difference between current and ideal body size, may be just some of the differences that separate those with BED from those with obesity in the absence of binge eating (Striegel-Moore et al., 1998). In addition, BED samples have typically been shown to be in less psychological distress than AN and BN groups (Fairburn & Wilson, 1993; Yanovski, 1993).

Therefore, it will be important to examine those diagnosed with BED in the present study and to compare findings of the present study to those reported in the literature. Also, it is important to further separate the clinical and personality differences

among those with BED, BN, and AN, and their respective subtypes. The differences between BED and BN, both in terms of personality and clinical characteristics, need to be more clearly understood. Finally, how BED relates to the other diagnostic categories needs to be addressed. As previously mentioned, there is a scarcity of literature looking at BED and associated personality traits. The following section presents empirical research that examines differences among the AN-B, BN, and AN-R groups.

General Psychopathology and Eating Disorder Symptomatology Profiles Among Those
with AN-B, BN, and AN-R

Recent studies (Cachelin & Maher, 1998; Casper, Hedeker, & McClough, 1992; Edwin, Andersen, & Rosell, 1988; Hurt, Brun-Ebérentz, Commerford, Samuel-Lajeunesse, & Halmi, 1997; Norman & Herzog, 1983) have shown the AN-B group to be most ill compared to other eating disorder groups. The AN-B group's profile was suggestive of irritability, underachievement, alienation, unpredictability, suicidal ideation, sexual conflicts (Norman & Herzog, 1983), impulsiveness (Hurt et al., 1997), high levels of dysphoria and anxiety (Edwin et al., 1988; Hurt et al., 1997), and overall poor adjustment. Interestingly, both BN and AN-B groups were high on the Psychopathic Deviate scale (scale 4) of the MMPI, implying the presence of hostility and anger, coupled with an inability to express these feelings directly (Norman & Herzog, 1983). Both the AN-B and the BN groups displayed emotional adventurousness and characterological problems (Casper et al., 1992), as well as a profile indicating feelings of isolation, impulsiveness, depression, and a dramatic disposition (Edwin et al., 1988). In addition, Hurt et al. (1997) described certain groups (i. e. BN-purging type, AN-B, BN-with a history of AN) as demonstrating acute stress, dysphoria, isolation, alienation, and

anger. The AN-R group consistently displayed less general psychopathology compared to the AN-B and BN groups on a variety of psychopathology measures such as the MMPI and the Hamilton Depression Rating Scale, among other scales (Casper et al., 1992; Edwin et al., 1988; Hurt et al., 1988; Rosen, Murkofsky, Steckler, & Skolnick, 1989).

Looking at the EDI-2, several studies (Mickalide & Andersen, 1985; Raymond et al., 1995; Rosen et al., 1989) have pointed to higher levels of some eating disorder pathology in AN-B groups compared to BN or AN-R groups. Some authors (Mickalide & Andersen, 1985) have found individuals with AN-B to have higher scores on most subscales of the EDI except the Bulimia and the Maturity Fears subscales when compared to AN-R and BN samples. Rosen et al. (1989) also found the most eating disorder pathology on the EDI among those with AN-B compared to those with AN-R and BN. Peak scores for the AN-B group were on scales of Ineffectiveness, Interoceptive Awareness, Drive for Thinness, and Maturity Fears, again complimenting the literature which showed this group to be more distressed and ill than the BN and AN-R groups (Norman & Herzog, 1983). Finally, Cachelin and Maher (1998) also found higher levels of distress in those with AN-B and BN compared to those with AN-R on the Body Distortion Questionnaire and the EDI.

Several studies have found the eating disorder profiles for individuals with AN-R tend to be less elevated than they are for the AN-B and BN groups. Sunday, Halmi, Werdann, and Levey (1992) considered psychological attributes and body size estimation among similar subsets of patients, adding two control groups of obese individuals and unrestrained eaters who did not binge eat. In particular, while the AN-R group maintained more elevated levels of Drive for Thinness, lack of Interoceptive Awareness,

and Maturity Fears compared to the two control groups mentioned above, the AN-R group was less elevated than AN-B and BN samples.

Given that individuals with AN-R are often severely underweight and suffering from other distressing symptoms of the illness, it is not clear why they report fewer symptoms than AN-B and BN samples. One possibility is that they are more guarded in the symptoms they present. The issue of impression management will be explored in the present study.

To summarize, those with AN-B usually generate profiles indicating more severe and diffuse psychopathology compared to BN and AN-R groups. In particular, individuals with AN-B appear to be more distressed than those with AN-R (Edwin et al., 1988) or BN (Hurt et al., 1997), more prone to self-injurious behaviour and suicide attempts, as well as alcohol and drug abuse (Cachelin & Maher, 1998). They have also been characterized as more impulsive than AN-R groups, showing a dramatic personality profile (Edwin et al., 1988). Moreover, individuals with both AN-B and BN quite often report a high degree of social non-conformity, feelings of isolation, anger, and hopelessness. These individuals may also experience a high level of defensiveness and feelings of persecution or paranoia, consistent with a diffuse clinical presentation.

AN-R and Obsessive-Compulsive Personality Traits: Empirical Research

Obsessive-compulsive traits have been associated with AN in the literature (Holden, 1990; Rastam, 1992; Rothenberg, 1986). A study (Small, Madero, Gross, Teagno, Leib, et al., 1981) that did not subdivide the diagnosis of AN into restricting or binge/purge type reported a broad range of symptomatology including “neurotic”, psychotic, and psychosomatic features, in individuals with AN. These features included

depression, feelings of alienation, and thought disorder. Another early study observed symptomatology such as inhibition, obsessionality, and compliance in 69% to 87% of the patients examined. (Dally, 1969 in Vitousek & Manke, 1994). A more recent study (Thornton & Russell, 1997) considered the presence of Obsessive-Compulsive Personality Disorder (OCPD; Axis II) in individuals with AN, not differentiating between subtypes. Thirty-seven percent of their AN sample met criteria for Obsessive-Compulsive Disorder (OCD), while only 3% of the BN sample met these criteria. These authors also provided empirical support for obsessionality as a premorbid characteristic in AN. The above studies did not distinguish between AN-R and AN-B. Other authors (Rastam, 1992; Strober, 1981) have had similar findings characterizing AN in terms of traits like perfectionism, social introversion, compliance, and passivity (Edwin et al., 1988).

Although the literature suggests obsessive-compulsive traits for the AN groups, few studies have differentiated AN-R from AN-B. When looking at obsessive-compulsive traits, two studies (Casper et al. 1992; Zubieta, Demitrack, Fenick, & Krahn, 1995) distinguished those with AN-R from those with AN-B and BN. Casper et al. (1992) found obsessive-compulsive personality traits in individuals with AN-R, but not in those with AN-B. The profile of those with AN-R indicated depression, and a higher level of behavioural control, emotional control, and cognitive control (traditionalism) as compared to the AN-B, BN, and control groups. The AN-R patients showed greater than average self-discipline, emotional caution, and conscientiousness; these traits are consistent with an obsessive-compulsive profile. However, Zubieta et al. (1995) found that individuals meeting criteria for both AN and BN (comparable to AN-B) displayed

more obsessive-compulsive symptomatology on the Symptom Checklist-90-Revised than individuals with AN-R or BN alone. The present study explores the presence of obsessive-compulsive traits in individuals with AN-R, while comparing them to those with AN-B, BN, and BED. The present study primarily addresses the presence of obsessive-compulsive personality traits, not OCD traits, in the diagnostic groups.

BN, AN-B and Borderline Personality Traits: Empirical Research

An early study by Norman and Herzog (1983) found an MMPI profile suggestive of borderline personality traits in their bulimic sample. This profile indicated poor impulse control, acting-out behaviour, poor insight, egocentricism, shallow interpersonal relationships, chronic depression, and vulnerability to addictive behaviours. Johnson, Tobin, and Enright (1989) reported that 41% of their 95 consecutive referrals for BN met criteria for a borderline personality disorder based on the Borderline Syndrome Index. Furthermore, other researchers (Skodol, Oldham, Hyler, Kellman, Doidge, & Davies, 1993) noted an association between BN and borderline personality disorder, supporting similar reports of the link between BN and borderline personality traits (Herzog, Keller, Lavori, Kenny, & Sacks, 1992; Norman, Blais, & Herzog, 1993; Steiger, Liquornik, Chapman, & Hussain, 1991). Furthermore, Raymond et al. (1995) found that it was more common to see Axis II impairment in those with BN, with a higher percentage of these individuals meeting criteria for borderline and self-defeating personality disorders.

Some studies (Herzog et al., 1992; Piran et al., 1988) have also found an association between AN-B and borderline personality traits. For example, Piran et al. (1988) found that two-thirds of their AN-B sample met criteria for borderline, histrionic, narcissitic, and antisocial personality disorders; one-half of the patients were diagnosed

with borderline personality disorder, reflecting an impulsivity in behaviour. Herzog et al. (1992) concluded that when compared to an AN-R sample, individuals with AN-B and BN had higher rates of borderline personality disorder. Garfinkel and Gallop (1992) also have observed impulsivity to be common among those with AN-B.

Few studies have tried to differentiate eating disorder groups based on borderline personality symptoms. Yanovski et al. (1993) found that borderline personality disorder was more common in individuals with BED compared to an obese control sample, however no studies were found comparing BED to AN-R, AN-B, and BN groups on borderline traits. The present study provides the opportunity for such a comparison.

General Psychopathology and Eating Disorder Pathology in BED: A Comparison to Obese and Control Samples

Much of the research has compared individuals with BED to non-binge eating or obese control groups (Grissett & Fitzgibbon, 1996; Marcus, Wing, & Hopkins, 1988). Generally, most studies that were reviewed for this study showed those with BED to be significantly more distressed, anxious, depressed, and as having more eating disorder specific pathology (Antony, Johnson, Carr-Nangle, & Abel, 1994; Grissett & Fitzgibbon, 1996; Kolotkin et al., 1987; Marcus & Wing, 1986; Marcus, Wing, & Hopkins, 1988) and borderline personality traits (Yanovski et al., 1993) than obese and non-binge eating control samples (Grissett & Fitzgibbon, 1996). Individuals with BED have also been described as experiencing less behavioural competence in relation to weight control, less ability to resist temptation, and more severe binge eating than obese non-binge eating samples (Grissett & Fitzgibbon, 1996). It has been suggested that obese individuals who report binge eating constitute a fairly homogeneous group, and are generally more

distressed than obese individuals who do not binge eat (Grissett & Fitzgibbon, 1996). These authors concluded that the diagnosis of BED was an important and clinically relevant one in terms of treatment for these individuals.

Other studies (Marcus et al., 1988; Marcus & Wing, 1986; Marcus, Wing, Ewing, Kern, Gooding, & McDermott, 1990; Schwalberg, Barlow, Alger, & Howard, 1992; Telch & Stice, 1998; Yanovski et al., 1993) have found the presence of comorbid psychiatric disorders, primarily anxiety (Schwalberg et al., 1992; Yanovski et al., 1993) and affective disorders (Telch & Stice, 1998), in samples of individuals with BED.

Thus far, there is clear evidence to suggest that individuals with BED do in fact experience higher levels of psychopathology, particularly affective disorders in comparison to other obese groups (Mitchell & Mussell, 1995) and control groups (Yanovski et al., 1993). Moreover, these individuals tend to report more psychological symptoms and distress, lower self-esteem, more impulsivity (deZwann et al., 1994), and greater feelings of demoralization when compared to those who do not binge eat, but who are obese.

BED Compared to BN on General Psychopathology and Eating Disorder Pathology

Studies have found that individuals diagnosed with BED display less global psychopathology than those with BN (deZwaan, 1997). For example, Brody et al. (1994) found lower levels of general psychopathology on the Beck Depression Inventory, the Symptom Checklist-90, and the General Symptom Index, for their obese sample with BED compared to their BN sample. Similarly, Raymond et al. (1995) observed outpatients with BED to present with lower scores on anxiety and depression measures compared to an age-matched group of individuals with BN. Lower levels of general

psychopathology for individuals with BED compared to those with BN have also been observed by numerous other researchers (Fichter et al., 1993; Hay & Fairburn, 1998; le Grange, Telch, & Agras, 1997). However, Fichter et al. (1993) did find comparable levels of elevated anger and hostility scores in BED and BN samples compared to obese subjects.

The question of the severity of psychopathology in BED relative to BN is still under investigation (Mitchell & Mussell, 1995). Some findings have suggested that those with BED appear equally distressed on certain clinical symptomatology when compared to those with BN-purging type or nonpurging BN (Tobin, Griffing, & Griffing, 1997). Other research has found those with BED to occupy an intermediate position between those with BN and non-BED obese individuals (Fichter et al., 1993; Hay & Fairburn, 1998).

Some studies report that individuals with BED tend to be less distressed than those with BN on general psychopathology and eating disorder pathology measures (le Grange et al., 1997; Molinari, Ragazzoni, & Morosin, 1997; Raymond et al., 1995). Raymond et al. (1995) found their BED sample to be less ego dystonic about binge eating and less fearful about gaining weight than those with BN. Tobin et al. (1997) and Raymond et al. (1995) observed significantly lower scores on Drive for Thinness and Interpersonal Distrust for those with BED compared to those with BN. Lower levels of Bulimia, Ineffectiveness, and Interoceptive Awareness as measured by the EDI have also been observed in those with BED compared to those with BN (Raymond et al., 1995). However, individuals with BED have been found to display high levels of body dissatisfaction (Fichter et al., 1993; Raymond et al., 1995; Striegel-Moore et al., 1998;

Tobin et al., 1997), that may be due to some of the physical and social consequences of being overweight in a “thinness-oriented” society.

In summary, it appears that individuals with BED present slightly different concerns and experiences than do those with BN. There is certainly some evidence pointing to less general psychological distress and behavioural difficulties among those with BED as compared to other eating disorder groups (Raymond et al., 1995). However, there is also evidence indicating a high level of affective instability and depressive symptomatology among individuals with BED that separate them from obese samples who do not engage in binge eating (Grissett & Fitzgibbon, 1996; Yanovski et al., 1993). Almost no literature is reported comparing BED to AN-R and AN-B samples. This study attempts to differentiate BED from the AN-R, AN-B and BN groups on general and eating disorder psychopathology.

The Issue of Impression Management and Related Research

Very little research has been done on the response set biases or impression management styles of eating disorders samples (Vitousek, Daly, & Heiser, 1991), yet this is an interesting and clinically relevant area of investigation. Impression management is an important issue when trying to understand or measure the personality and clinical differences between several eating disorders groups, because response styles may distort or mask vital distinguishing features among the groups. Clinical severity within a group may also be more difficult to assess, and therefore treat.

It is thought that patients will tend to present themselves in a certain way depending on their diagnosis. For example, Vitousek et al. (1991) (who do not distinguish between the subtypes) describe patients with AN as very protective of their

private experiences, often refusing to concede that they suffer from a psychiatric disorder requiring treatment. Denial of symptomatology and the clinical presentation that “things couldn’t be better”, is typical. Specifically, denial of appetite, emaciation, and illness are common (Scott, 1948 in Vitousek et al., 1991). In contrast, impression management in BN and AN-B may be quite different. Individuals with BN are more likely to admit problematic behaviour and cooperate with attempts to understand and modify it (Vitousek et al., 1991). Raymond et al. (1995) found that when looking at groups of BN and BED subjects, the BN group was more likely to have given random and dishonest answers than the BED group.

Two different suggestions for greater impression management in the AN group (not distinguishing between subtypes) have been offered. First, impression management may be an attempt to avoid treatment, since treatment for AN inevitably involves weight gain (Goldner, Birmingham, & Smye in Garner & Garfinkel, 1997). Second, it may be that individuals with AN are out of touch with their symptomatology, given the lack of interoceptive awareness that is typically associated with the disorder.

The present study explores the issue of impression management styles in four groups of eating disordered patients. The above literature primarily covered the AN and the BN groups, emphasizing more positive impression management for the AN-R group, and a negative impression management style for the BN group and perhaps the AN-B group. It will be interesting to explore how the BED group, a relatively new diagnostic group, presents itself clinically in comparison to the other three groups. The present study provides an opportunity to look at impression management with the use of the validity scales of the PAI.

Summary

Thus far, some of the personality traits associated with AN-R, AN-B, BN, and BED in the clinical literature have been explored, and empirical data suggesting certain differences between groups has been offered. Generally, the AN-B group and in some cases the BN group, have presented as more ill than AN-R and BED groups. Furthermore, the literature has pointed to certain clusters of personality traits for the various groups. For example, AN-R was primarily associated with Cluster C or the obsessive-compulsive dimension of traits (Dennis & Sansone, 1997). BN and AN-B were primarily linked to Cluster B or borderline personality traits (Dennis & Sansone, 1997). Finally, given that the diagnosis of BED is novel and controversial, little research has explored the link between BED and problematic personality features, although preliminary research has suggested less general psychopathology and distress in samples of those with BED (Hay & Fairburn, 1998; Raymond et al., 1995).

In order to further explore how AN-R, AN-B, BN, and BED may differ on personality and clinical differences, the present study uses the PAI and the EDI-2 respectively. Profile differences among the four diagnostic groups are examined as well as specific hypotheses based on the literature. The following section presents the reader with a set of hypotheses for the present study.

Hypotheses

The first hypothesis states that the AN-B and BN groups will be higher on borderline personality traits compared to AN-R and BED groups. Borderline personality features were described previously in this paper and include such characteristics as affective instability, strained and complex interpersonal relationships, and identity

problems. Thus, a number of scales and subscales will be used to tap these borderline qualities. From the PAI, the Borderline Features scale measuring Affective Instability, Negative Relationships, Identity Problems, and Self-harm; the Traumatic Stress subscale; and the Suicidal Ideation scale will be used. The Interpersonal Distrust scale of the EDI-2 will also be used as a measure of borderline traits.

The second hypothesis is that the AN-R group will be higher on obsessive-compulsive traits compared to the other three diagnostic groups. The Obsessive-Compulsive subscale of the PAI, and the Perfectionism and Asceticism scales of the EDI-2 will measure these traits.

Related to the first hypothesis that addresses borderline traits in AN-B and BN, the third hypothesis considers the impulsivity factor that is clinically associated with borderline traits in the literature. This hypothesis is that the AN-B and BN groups will score higher than the AN-R and BED groups on risk-taking personality features. These features will be measured by the Stimulus Seeking and Egocentricity subscales of the PAI, and the by Impulse Regulation scale of the EDI-2.

Finally, the last hypothesis is that the AN-B and BN groups will score higher than the AN-R and BED groups on the Negative Impression Management (NIM) scale, and that the AN-R group will score higher than the other three groups on the Positive Impression Management (PIM) scale. These two validity scales tap clinical presentations of patients that are exaggerated, consciously or unconsciously, in both the positive and negative direction. Based on the scant literature in this area (Cachelin & Maher, 1998), higher scores on the NIM are expected to differentiate the BN and AN-B groups from the AN-R and BED groups, while higher scores on the PIM scale are expected to separate the

AN-R group from the other groups. The existing literature has not looked at impression management in a BED sample. The question of impression management for the BED group will be left open for exploration, given the novelty of this inquiry.

Method

Subjects

Subjects consisted of 173 females referred to the Regional Centre for the Treatment of Eating Disorders at the General Campus of the Ottawa Hospital, Ottawa, Canada for assessment, diagnosis, and potential treatment. Specifically, there were 39 individuals in the BED group, 31 in the AN-R group, 40 in the AN-B group, and 63 in the BN group. These individuals were typically referred to the program by their family physician or by another medical specialist when the presence of an eating disorder was suspected. Subjects had to be a minimum of 18 years of age to be referred to this Centre, and there was no upper limit age requirement. Only females diagnosed with AN-R, BN, AN-B, and BED were included in this study to ensure adequate sample sizes for each diagnostic group. Individuals who were diagnosed with the nonpurging form of BN or with an Eating Disorder Not Otherwise Specified (EDNOS) were not included in this study due to insufficient sample size.

Procedure

When patients presented for their initial consultation, they met with a psychiatrist or a clinical psychologist for the clinical interview. The interview was used to assess the patients for the presence of eating disorder symptoms, along with other Axis I and Axis II psychopathology based on the criteria detailed in the DSM-IV (APA, 1994). Axis II

diagnoses were often deferred at the time of consultation due to insufficient information and are not dealt with in the present study.

As a validation check on the diagnoses, 10% of all consultations referred to the Centre were randomly selected and re-evaluated by an independent clinician blind to the diagnosis. Identifying information and diagnostic conclusions were removed from the re-evaluated reports. Agreement between the independent clinician and the original diagnosis was 86%, suggesting a high level of agreement.

Patients diagnosed as having an eating disorder participated in the psychological testing phase of the consultation process. Tests administered included the Personality Assessment Inventory (PAI; Morey, 1991), and the Eating Disorder Inventory-2 (EDI; Garner, 1991), administered either in paper/pencil format or in a computerized format. Each patient signed a consent form prior to any testing.

Ethics approval was granted by the Ottawa Hospital (General Campus) Research Ethics Board (November 13, 1998) and by Carleton University Research Ethics Board (December 1998). The study met appropriate criteria for research involving the participation of human subjects.

Measurements

The present study utilized two psychometric tests, the PAI and the EDI-2. They are presented in the following section.

Personality Assessment Inventory (PAI)

The use of the PAI in the present study represented a novel addition to the personality research in the area of eating disorders. To date, the PAI has not been utilized with an eating disorder population.

The PAI is a relatively new, but very promising personality profile inventory (Morey, 1991). A benefit of the PAI is that it contains 344 self-report items for a total of 22 nonoverlapping full scales and 31 nonoverlapping subscales. There are four validity scales (Inconsistency [INC], Infrequency [INF], Negative Impression [NIM], Positive Impression [PIM]); 11 clinical scales (Somatic Complaints [SOM], Anxiety [ANX], Anxiety-Related Disorders [ARD], Depression [DEP], Mania [MAN], Paranoia [PAR], Schizophrenia [SCZ], Borderline Features [BOR], Antisocial Features [ANT], Alcohol Problems [ALC], Drug Problems [DRG]); five treatment scales (Aggression [AGG], Suicidal Ideation [SUI], Stress [STR], Nonsupport [NON], Treatment Rejection [RXR]); and finally, two interpersonal scales (Dominance [DOM], Warmth [WRM]). Each of the clinical scales, as well as the Aggression scale is made up of three or four subscales.

The PAI is a standardized personality inventory for use in clinical assessment of individuals in the age range of 18 years through adulthood, and is written at a 4th grade reading level. The standardization sample consisted of 1000 community dwelling adults selected to match the 1995 U. S. census projections on the basis of gender, race, and age. The PAI's raw scores are converted to T scores for interpretation. Therefore, a T score of 70 or above represents a pronounced deviation from the typical responses of adults living in the community, and would signify some pathology. The PAI does not have separate norms for women and men because it was thought that these would distort the natural epidemiological differences between genders (Morey, 1991).

Reliability of the PAI is adequate. Internal consistency alphas for full scales range from .81 to .86 for normative, college and clinical samples, respectively. There is also little variability in these alpha coefficients as a function of race, gender, or age (Morey,

1991). In the standardization studies, test-retest reliability over a 4-week period for the 11 clinical scales was sufficient at .86 (Morey, 1991).

The scales and subscales of the PAI were developed out of a construct validation framework that emphasized a practical as well as a theoretically informed approach to the creation and selection of items, taking into consideration contemporary diagnostic practice. The clinical scales are theoretically concordant with most major instruments for the assessment of diagnosis and treatment efficacy (Morey, 1991). A strong emphasis was also put on the assessment of the scales' stability and correlates. The content of the scales was essentially theory-driven, and both the conceptual nature and empirical adequacy of the items helped to determine their inclusion in the final version of the PAI.

The PAI presents many benefits over the traditionally and widely used MMPI or MMPI-2. It uses up-to-date diagnoses and terms to describe common personality and clinical features in today's population. This inventory was also normed on a sample carefully selected to match a more generalizable sample in the United States in 1995. The PAI's use of updated items, its strong psychometric properties described above, and lack of use in the area of eating disorders make it an appropriate and interesting inventory for use in the present study.

Eating Disorder Inventory-2 (EDI-2)

The EDI-2 (Garner, 1991) was used in the present study as a measure of eating disorder pathology and clinical symptomatology. The EDI-2 is a well-recognized and widely used self-report instrument, used to measure symptoms typically associated with BN and AN. It is comprised of the 64 items from the original version, along with 27 additional items that make up the three new provisional scales, Asceticism, Impulse

Regulation, and Social Insecurity. The original inventory includes three scales assessing attitudes and behaviours concerning eating, weight, and shape (i.e, Drive for Thinness, Bulimia, Body Dissatisfaction), and five scales measuring more general organizing constructs or psychological traits clinically relevant to eating disorders (i.e, Ineffectiveness, Perfectionism, Interpersonal Distrust, Interoceptive Awareness, Maturity Fears). This inventory was structured to reflect the multidimensional aspects of eating disorders.

The construction, validation, and initial reporting of the EDI norms were based on a variety of clinical groups, including those with eating disorders (Garner & Olmsted, 1984; 1986). The reporting of norms for eating disorder patients was based on a sample of 889 individuals, 129 with AN-R, 103 with AN-B, and 657 BN patients. Separate norms are available for each tested group, to allow for the selection of a more accurate comparison group. The EDI-2 has separate norms for a female college sample based on 770 nonpatient female college students who participated in the original EDI validation. This is the normative sample referred to in the present study.

Reliability coefficients (alphas) for the original EDI scales were between .83 and .93 for the eating disorder sample (Garner & Olmsted, 1984). Wear and Pratz (1987) reported test-retest reliability coefficients above .80 for all scales except Maturity Fears. Another study reported a range of reliability coefficients as well, .41 to .75, with one year between testing sessions (Crowther, Lilly, Crawford, Shepherd, & Oliver, 1990). Among the more stable symptoms or behavioural patterns after one year were Drive for Thinness, Body Dissatisfaction, Ineffectiveness, Perfectionism, and Interpersonal Distrust. This

finding complimented the original conceptualization of these scales as reflecting enduring traits.

The EDI-2 demonstrates a high degree of face validity, in that the domains of interest are tapped in a direct manner. Similarly, the inventory also shows good content validity. One hundred and forty-six items were generated by clinicians who were both familiar with the research literature on eating disorders and were involved in patient treatment. Eleven meaningful, eating disorder-related constructs were found based on the writings of prominent theorists in the field, and only eight of the dimensions met final reliability and validity requirements (Garner, 1991). When the EDI was originally developed, items were only retained if they were more highly correlated with their intended scale than with all other subscales (Garner, Olmsted, & Polivy, 1983).

The EDI scales have been shown to differentiate between eating disorder and nonclinical groups in various studies (Garner et al., 1983), displaying good criterion-related validity. All of the items in the original EDI were shown to discriminate between eating disorder and nonpatient samples (Garner, 1991).

Concurrent validity was established by comparing patient self-report profiles with the judgements of experienced professionals who were well acquainted with the patients' clinical presentations (Garner, 1991). In order to establish additional concurrent validity for the Bulimia scale, those diagnosed with BN were compared to those patients without BN. In the original validation study, those with AN-binge/purge type were compared to those diagnosed with AN-restricting type. A discriminant function analysis utilizing all of the EDI subscales correctly classified 85% of the subjects into bulimic and restricter subtypes (Garner et al., 1983).

Convergent validity has been demonstrated between the EDI and such scales as the Eating Attitudes Test, and the Restraint Scale. Several of the EDI subscales overlap conceptually with self-report measures that were administered in the initial EDI validation process (Garner, 1991). Correlations with these measures (i.e., the Feelings of Inadequacy scale, the Beck Depression Inventory, Locus of Control's "Lack of Self-Control" subscale, Physical Anhedonia and the Hopkins Symptom Checklist assessing the domains of somatization, obsessiveness, anxiety, depression, and interpersonal sensitivity) provide evidence for convergent validity.

In summary, it appears that the EDI-2 measures clinically relevant dimensions of experience for patients with eating disorders. The original subscales show appropriate content and criterion validity, and there is evidence of adequate convergent and discriminant validity as well. The EDI-2 has sound psychometric properties, and symptom domains that the constructs measure have clinical utility.

Data Analysis

The goal of the present study is to distinguish the four subtypes of eating disorder groups on the basis of their scores on the PAI scales and the EDI-2 scales. Therefore, the method of analysis is discriminant function analysis. This analysis is primarily used for: (1) describing major differences among the groups in MANOVA, and (2) classifying subjects into groups based on a battery of measurements (Stevens, 1996). The independent variables in this study are the PAI and the EDI-2 scale scores, and the dependent variables are the diagnostic groups. The discriminant function analysis has two very important and useful features. It is parsimonious, so that when comparing several groups on a number of variables as in the present study, discriminant analysis

allows one to separate the groups on a fewer number of dimensions that take into consideration a broader construct. This facilitates a simpler, more cohesive interpretation. Discriminant analysis also has a clarity of interpretation in that the separation of the subject groups along one function is unrelated to separation along a different function (Stevens, 1996).

The following assumptions were considered for the discriminant function analysis: multivariate normality, sensitivity to outliers, homogeneity of variance-covariance matrices, linearity among all pairs of predictors within each group, and the assumption regarding the potential presence of multicollinearity and singularity (Tabachnick & Fidell, 1996).

Results

Description of the Sample

The total sample consisted of 173 women. Table 1 presents the mean ages, Body Mass Indexes (BMI), and chronicity for each of the diagnostic groups. Simple ANOVAs were conducted on each of these measures using diagnostic group as the independent variable.

For age, Levene's test of homogeneity of variance was met for ANOVA, $F(3, 169) = .692$. There were no multivariate outliers or influential data points. Univariate analyses at the .05 level revealed significant between-group differences in age, $F(3, 169) = 14.06$, $p = .000$. Follow-up pairwise comparisons using Tukey's HSD at the .05 level revealed that the BED group was significantly older than the AN-R, AN-B, and BN groups. The other diagnostic groups were not significantly different.

An ANOVA was done using BMI as a dependent variable and diagnostic group as the independent variable. For BMI, Levene's test of homogeneity of variance was significant, $F(3, 161) = 25.23, p = .000$, due to the restricted variability by definition for the AN-R and AN-B groups. Although there was a violation of the homogeneity assumption, the F-test was considered to be conservative since the largest variance was consistently associated with the largest sample size (Stevens, 1996). Therefore, an alpha of .05 was used. There were no multivariate outliers or influential data points. The ANOVA on BMI was significant and showed differences between the diagnostic groups on this variable, $F(3, 161) = 113.79, p = .000$. When the ANOVA was followed up with Tukey's pairwise tests, all the groups significantly differed from each other on BMI, except that the AN-R group did not differ from the AN-B groups. As expected, the BED group had the highest BMI, followed by the BN group, then the two AN groups.

Another ANOVA was done on the chronicity of illness variable for the diagnostic groups testing at the .05 level. In the present study chronicity was defined in terms of the patient's subjective report of how long they had been suffering with an eating disorder. Levene's test of homogeneity of variance did not show significance for chronicity of eating disorder, $F(3, 154) = 2.19, p = .091$. There were significant differences among the groups, $F(3, 154) = 5.60, p = .001$. Tukey's test showed that the BED group had a significantly greater number of years with their disorder than the AN-R group.

Table 1. Means and standard deviations of age, Body Mass Index (BMI; kg/m²), and chronicity of eating disorder for each diagnostic group.

Diagnosis	Age (years)			BMI (kg/m ²)			Chronicity (years)		
	N ^a	Mean	SD	N ^a	Mean	SD	N ^a	Mean	SD
BED	39	38.38	9.10	39	40.62	9.99	30	14.57	9.36
AN-R	31	25.13	8.23	30	16.82	1.28	29	5.80	6.86
AN-B	40	29.95	9.24	38	17.03	1.65	39	9.47	8.78
BN	63	29.78	8.83	58	27.83	6.89	60	10.16	7.95
Total	173	30.92	9.85	165	26.36	11.25	158	10.03	8.62

^aNote: The number of subjects for which this information is available varies due to incomplete data sets. In some of the older charts of patients, this information was not recorded by the interviewer.

Table 2 displays the percentage of individuals with a given eating disorder that also had a comorbid Axis I diagnosis. A Pearson Chi Square test of independence was done to explore the relationship between diagnosis and comorbid Axis I diagnosis. The analysis was significant, $\chi^2(3) = 15.11$, $p = .002$, due to higher rates of comorbidity in individuals with AN-B and BN (58.3% and 58.6%, respectively) compared to those with AN-R and BED (27.6% and 26.5%, respectively). Of the individuals within a specific diagnostic group with a comorbid Axis I diagnosis, seven individuals in the BED group (20.6%), four in the AN-R group (13.8%), 13 in the AN-B group (36.1%), and 25 in the BN group (43.1%) had a comorbid mood disorder, primarily depression.

Table 2. Presence of comorbid Axis I disorders by diagnostic category.

Diagnosis	Number of Subjects^a	% of Subjects with Axis I
BED	34	26.5
AN-R	29	27.6
AN-B	36	58.3
BN	58	58.6
Total	157	45.9

^aNote: The number of subjects for which this information is available varies due to incomplete data sets. In some of the older charts of patients, this information was not recorded by the interviewer.

Overview of Diagnostic Group Differences

In this section, the mean profiles for the PAI and EDI-2 were examined. Two questions guided this inquiry. The first question was, what diagnostic groups differ from one another on the PAI and the EDI-2? This question involved using discriminant function analysis on these scales. Interpretation of the discriminant function involved determination of which structural coefficients (i.e., correlations between the discriminant function and the clinical scales) were high, indicating an association of that variable with the group separation. Stevens (1996) has suggested that a .01 alpha level for a statistically significant correlation be adapted (see Table 11.1 in Stevens, 1996, p. 371). For the sample size of the present study (173 subjects), the critical value was .38. This critical value will be used throughout the analyses. Tukey's HSD multiple comparisons were chosen to follow-up significant discriminant functions for the PAI full scales and the EDI-2 scales. Tukey's test was chosen in order to control for pairwise Type I error inflation resulting from multiple tests.

The second question was which scales were elevated relative to a normative sample for the diagnostic groups? To address this issue, group means with high or medium effect sizes when compared to the norms were identified. The D statistic was

used as a measure of effect size for each diagnostic group. D was computed by taking the difference between the sample mean for a scale and the appropriate norm, and then dividing by the sample standard deviation. Thus, $D = 1.0$ would indicate that the mean of the sample was one standard deviation above the norm. Following Cohen's recommendation, this effect size measure is typically interpreted as high at .80 or above, and medium at .50 to .79 (Stevens, 1996). The effect size measure was chosen over a significant single sample t -test because it was independent of sample size and provided more descriptive information. In fact, given that the present study had reasonably large sample sizes, the effect size measure was a more conservative method as compared to using the test of significance.

Group Differences on the PAI

Figure 1. PAI full scale profiles for each diagnostic group.

A discriminant function analysis was performed on the full scales of the PAI to determine how the diagnostic groups differed on these scales (see Figure 1). The test for homogeneity of variance was significant, Box M: $F(759) = 1.16$, $p = .002$. This was largely due to the positively skewed Suicide Ideation scale, with most individuals scoring low on this scale. There were no multivariate outliers or influential data points. Since, the BN group had the largest sample size and the largest generalized variance, the test of significance is conservative and an alpha of .05 was adopted (Stevens, 1996).

There was one statistically significant discriminant function, $\chi^2(66) = 92.31$, $p = .018$ (see Figure 2). The first discriminant function accounted for 51.6% of the between-groups variance. In examining the structure matrix, the correlation of the variables with the discriminant function, six scales exceeded the cut-off of .38 for significance. These scales were Depression (DEP, .58), Suicidal Ideation (SUI, .54), Borderline Features (BOR, .44), Schizophrenia (SCZ, .49), Anxiety-Related Disorders (ARD, .43), and Treatment Rejection (RXR, -.38). Thus, higher discriminant function scores were associated with higher values on the five symptom scales, and lower Treatment Rejection scores. Taken together, these scales may represent a general psychopathology dimension. The group centroids are plotted in Figure 2 showing the separation among groups for the significant discriminant function.

Figure 2. Significant discriminant function separating the diagnostic groups on the PAI full scales.

Tukey's comparisons on the discriminant function means using an alpha of .05, showed that the BED group scored significantly lower than the other three diagnostic groups on this general psychopathology dimension. In addition, the AN-B group's scores were significantly higher (indicating greater pathology) than the other three groups. Falling in an intermediate position were the AN-R and BN groups which did not differ from each other.

Profiles of the EDI-2 for Each Diagnostic Group

Figure 3 shows the EDI-2 profiles for the four diagnostic groups. As in the case of the PAI, it was of interest to look at these profiles to explore how the diagnostic groups separated.

Figure 3. EDI-2 profiles for each diagnostic group.

A discriminant function analysis was computed for the 11 scales of the EDI-2. The test for homogeneity of variance was significant, Box M: $F(198) = 1.47, p = .000$. This was due to the positively skewed Interoceptive Awareness, Bulimia, Interpersonal Distrust, and Maturity Fears scales, and the negatively skewed Body Dissatisfaction scale. There were no multivariate outliers or influential data points. Since, the BN group had the highest generalized variance and was also the largest group, the test of the discriminant functions was conservative (Stevens, 1996). Thus, an alpha of .05 was used.

The discriminant analysis showed that the first two functions were significant, $\chi^2(33) = 146.38, p = .000$, and $\chi^2(20) = 35.90, p = .016$. A Varimax rotation was used on the two significant discriminant functions to simplify interpretation. Group centroids are plotted in Figure 4. As specified previously (Stevens, 1996) a .38 criterion was used to decide which structural coefficients were statistically significant. Six of the 11 EDI-2 scales were associated with the separation among the groups on the first discriminant function; they were as follows: Interoceptive Awareness (.49), Perfectionism (.45), Interpersonal Distrust (.42), Ineffectiveness (.40), Social Insecurity (.39), and Impulse Regulation (.38). The first discriminant function accounted for 68.6% of the variance. Tukey's test, using an alpha of .05 showed that the BED group was lower than the other three groups, while the BN group was lower than the AN-B and AN-R groups (see Figure 4). This function was called the AN-related discriminant function.

Only the Bulimia scale (.97) was strongly associated with the separation among the groups on the second significant discriminant function. The second discriminant function accounted for 31.4% of the between-groups variance. Tukey's test showed that the AN-R scored significantly lower than the other three groups. In addition, the AN-B

group had significantly lower scores than the BN group. The BED group did not differ from the BN or AN-B groups on this binge eating dimension.

Figure 4. Significant discriminant functions separating the diagnostic groups on the EDI-2 scales.

Comparing Diagnostic Groups to Norms of the PAI and EDI-2

Comparing diagnostic groups to the norms of the PAI

Where do the scale elevations lie among these diagnostic groups? To answer this question each group was compared to a PAI normative value of $T=50$. As noted earlier, D values (standard deviation units away from the norm) were calculated. Table 3 presents the full scales of the PAI and the effect sizes for each diagnostic group. Of particular interest, was whether the BED group differed from the norm, given that this group's scores were often significantly lower than the scores for individuals with AN-B and BN. For the full scales of the PAI, the BED group did have a large effect size

compared to the norm for four scales: Somatic Complaints (SOM), Anxiety (ANX), Depression (DEP), and Borderline Features (BOR). This group also displayed a medium effect size for Negative Impression Management (NIM), Anxiety-Related Disorders (ARD), Suicidal Ideation (SUI), and Stress (STR) (see Table 3).

A striking pattern on specific measures of psychopathology was apparent in Table 3. All of the eating disorder diagnostic groups were elevated higher than the norm on a number of the clinical scales; Somatic Complaints, Anxiety, Anxiety-related Disorders, Depression, and Borderline Features. Additionally, all but the BED group had large effect sizes on Schizophrenia, and a large or medium effect size on Nonsupport. Finally, there were two scales, Positive Impression Management and Treatment Rejection, on which all four diagnostic groups scored below the norms, indicating less Positive Impression Management and Treatment Rejection compared to the norm. All but the BED group were well below the norm on the Dominance scale as well.

Table 3. D Values (Standard Deviation Units away from the norms) by diagnostic category^a.

	BED	AN-R	AN-B	BN
Inconsistency	0.47	0.29	0.24	0.51 *
Infrequency	0.00	0.51 *	0.66 *	0.21
Negative Impression	0.60 *	0.85 **	1.12 **	1.10 **
Positive Impression	-0.61 -	-0.98 --	-1.19 --	-1.30 --
Somatic Complaints	0.84 **	1.06 **	1.50 **	1.24 **
Anxiety	0.93 **	1.32 **	1.93 **	1.93 **
Anxiety-related Disorders	0.65 *	0.89 **	1.47 **	1.42 **
Depression	0.99 **	1.39 **	1.76 **	1.78 **
Mania	0.09	0.31	0.25	0.36
Paranoia	0.30	0.44	0.70 *	0.65 *
Schizophrenia	0.42	0.87 **	1.26 **	1.16 **
Borderline Features	0.81 **	1.19 **	1.81 **	1.97 **
Antisocial Features	-0.06	0.20	0.23	0.31
Alcohol Problems	-0.44	-0.59 -	-0.05	0.15
Drug Problems	0.21	0.24	0.17	0.27
Aggression	0.24	-0.18	-0.09	0.25
Suicidal Ideation	0.54 *	0.76 *	1.19 **	1.13 **
Stress	0.65 *	0.59 *	0.91 **	1.07 **
Nonsupport	0.43	0.50 *	0.93 **	0.70 *
Treatment Rejection	-1.43 --	-1.83 --	-2.95 --	-2.55 --
Dominance	-0.27	-0.82 --	-0.98 --	-0.54 -
Warmth	-0.09	-0.43	-0.48	-0.27

^aNote: *= Medium effect size ($D > .5$); **=Large effect size ($D > .8$)

- = Below the norms ($D < -.5$); --=Below the norms ($D < -.8$)

Comparing diagnostic groups to the female college norms (FCN) and eating disorder norms (EDN) of the EDI-2.

To explore which diagnostic groups might be elevated relative to the norms for the EDI-2, the scores for each diagnostic group were examined and compared to two sets of norms. First, to address which groups showed eating disorder pathology compared to healthy controls, groups were compared to the female nonpatient college norms (FCN) detailed in the EDI-2 manual (Garner, 1992). Second, to see how the diagnostic groups differed from other eating disorder samples with similar diagnoses, groups were compared to eating disorder norms (EDN). Based on the initial finding of significantly lower scores for the BED group compared to the other three groups on the AN-related

dimension, it was of interest to clarify whether this represented a lack of eating disorder pathology in this group or whether the BED group may be elevated compared to normative scores, but lower compared to the other diagnostic groups. Table 4 compares the effect sizes of the diagnostic groups to those of healthy controls.

Table 4. D Values (Standard Deviation Units away from Female College Student norms) for the EDI-2^a.

	BED	AN-R	AN-B	BN
Drive for Thinness	1.16 **	1.65 **	1.52 **	2.07 **
Bulimia	1.82 **	0.33	0.77 *	1.83 **
Body Dissatisfaction	2.34 **	0.68 *	0.69 *	1.42 **
Ineffectiveness	0.77 *	1.22 **	1.55 **	1.32 **
Perfectionism	-0.12	0.55 *	0.94 **	0.34
Interpersonal Distrust	0.29	0.87 **	1.08 **	0.72 *
Interoceptive Awareness	0.82 **	0.94 **	1.53 **	1.25 **
Maturity Fears	0.03	0.57 *	0.58 *	0.48
Asceticism	0.96 **	0.82 **	1.48 **	1.32 **
Impulse Regulation	0.09	0.46	0.81 **	0.59 *
Social Insecurity	0.48	0.96 **	1.16 **	1.00 **

^aNote: *= Medium effect size ($D > .5$); **=Large effect size ($D > .8$)

— = Below the norms ($D < -.5$); --=Below the norms ($D < -.8$)

A comparison of the BED group to the female college norms showed that the BED group was more elevated, with large effect sizes, than norms on Drive for Thinness, Bulimia, Body Dissatisfaction, Interoceptive Awareness, and Asceticism (see Table 4). They had a medium effect size on Ineffectiveness. These results indicated that the BED group was experiencing distress associated with their eating disorder. The AN-R, AN-B, and BN groups also differed from the female college norms on most scales of the EDI-2 with large and medium effect sizes (see Table 4). The exceptions were the Bulimia and the Impulse Regulation scales for the AN-R group; and Perfectionism and Maturity Fears for the BN group.

To further understand BED's elevations within a clinical context, their scores were compared to eating disorder norms (EDN) detailed in Garner (1992). The BED group was outside of these norms for most measures, unlike the other three groups (see Table 5). The BED group had large effect sizes lower than the eating disorder norms for Interoceptive Awareness and Impulse Regulation, and medium effect sizes lower than the eating disorder norms on Drive for Thinness, Perfectionism, Interpersonal Distrust, Maturity Fears, and Social Insecurity. The BED group had a large effect size above the eating disorder norms on Body Dissatisfaction (see Table 5). Generally, these results indicated less eating disorder-related psychopathology as measured by the EDI-2 for the BED group compared to the eating disorder norms. The AN-R, AN-B, and BN groups differed little from the eating disorder norms, each group differing only on one scale (see Table 5). The AN-R and AN-B groups were below the eating disorder norms on Bulimia, while BN was above these norms on Body Dissatisfaction.

Table 5. D Values (Standard Deviation Units away from eating disorder norms) for the EDI-2^a.

	BED	AN-R	AN-B	BN
Drive for Thinness	-0.52 -	0.06	0.05	-0.01
Bulimia	-0.35	-2.20 --	-0.72 -	-0.02
Body Dissatisfaction	1.42 **	0.18	0.18	0.74 *
Ineffectiveness	-0.37	0.16	0.47	0.20
Perfectionism	-0.72 -	-0.01	0.35	-0.32
Interpersonal Distrust	-0.73 -	0.06	0.33	-0.07
Interoceptive Awareness	-0.99 --	-0.07	0.25	0.11
Maturity Fears	-0.70 -	0.27	0.27	0.15
Asceticism	-0.36	-0.19	0.36	0.01
Impulse Regulation	-0.97 --	-0.25	0.03	-0.04
Social Insecurity	-0.64 -	-0.03	0.21	-0.03

^aNote: * = Medium effect size ($D > .5$); ** = Large effect size ($D > .8$)
 - = Below the norms ($D < -.5$); -- = Below the norms ($D < -.8$)

The following section will address the results pertaining to the specific hypotheses made earlier in this paper.

Tests of Specific Hypotheses

Hypothesis 1: AN-B and BN Will Score Higher on Measures Associated with Borderline Personality Traits Than Will Individuals with BED or AN-R

The predictors of borderline traits for this discriminant analysis were the Interpersonal Distrust scale on the EDI-2, the Suicidal Ideation scale, the Borderline Features full scale, and the Traumatic Stress subscale (of the Anxiety-related Disorders scale) of the PAI. Homogeneity of variance was met, Box M: $F(30) = 1.24$, $p = .168$. There were no multivariate outliers or influential data points. The first, $\chi^2(12) = 41.11$, $p = .000$; and the second, $\chi^2(6) = 16.44$, $p = .012$, discriminant functions were significant. Thus, two separate dimensions were identified (see Figure 5). Once again, a Varimax rotation was done to simplify interpretation.

Figure 5. Significant discriminant functions separating the diagnostic groups on borderline personality traits.

The structure matrix revealed that the first discriminant function loaded on measures of Interpersonal Distrust and Suicidal Ideation, with structure matrix correlations of .81 and .74, respectively. This discriminant function accounted for 60.9% of the between-groups variance. A planned comparison examined whether the AN-B and BN groups were more elevated than the AN-R and BED groups on this discriminant function. Taken together, the AN-B and BN groups were higher than the AN-R and BED groups taken jointly, $t(160) = 2.60$, $p = .010$. However, this effect was clearly due to the high scores of the AN-B group. The next highest mean was for the AN-R group. Thus, the first significant discriminant function was more of a reflection of AN-B and AN-R groups being higher on Interpersonal Distrust and Suicidal Ideation compared to the other two groups.

The second significant discriminant function loaded on Borderline Features, Traumatic Stress, and Suicidal Ideation, with structure matrix correlations of .95, .63, and .45, respectively (see Figure 5). This discriminant function followed the hypothesis more directly with the AN-B and BN groups being higher than the other two groups. This dimension was named the Borderline features function, and it accounted for 34.4% of the between-groups variance. The follow-up contrast on the discriminant function centroids examining the separation of the AN-B and BN groups from the AN-R and BED groups was significant, $t(160) = 3.35$, $p = .001$, with the AN-B and BN groups indicating more severe psychopathology on the above measures than the AN-R and BED groups. Thus, all scales separated the groups in the expected direction, except for Interpersonal Distrust where the AN-R group was also quite high; it should be noted that Interpersonal Distrust was the only scale taken from the EDI-2.

Hypothesis 2: The AN-R Group Will Score Higher on Measures of Obsessive-Compulsive Traits Than the AN-B, BN, and BED Groups

To measure obsessive-compulsive traits, the Obsessive-Compulsive subscale of the PAI was used, as well as the Perfectionism and Asceticism scales of the EDI-2. The homogeneity of variance assumption was met for this discriminant function analysis, Box M: $F(18) = .76$, $p = .751$. There were no multivariate outliers or influential data points. The test of this discriminant function indicated one statistically significant function at the .05 level, $\chi^2(9) = 31.78$, $p = .000$. According to the structure matrix, this function was associated with Perfectionism (.89), Obsessive-Compulsive traits (.76), and Asceticism (.52). The discriminant function accounted for 88.7% of the between-groups variance.

The a priori contrast comparing the AN-R to the other three diagnostic groups on group centroids associated with measures of obsessive-compulsive traits was not significant, $t(160) = .84$, $p = .401$, and therefore failed to support the hypothesis which predicted higher scores on these measures for the AN-R group (see Figure 6). This was largely due to the elevation of the AN-B group on these measures.

Figure 6. Significant discriminant function separating the diagnostic groups on obsessive-compulsive traits.

Finally, in light of these findings, a post-hoc contrast was done to compare the two AN groups to the other two groups on the discriminant function centroids using an alpha of .05. It was significant, $t(160) = 4.69$, $p = .000$, indicating that the AN groups combined were more elevated than the BN and BED group on obsessive-compulsive traits.

Hypothesis 3: The AN-B and BN Groups Will Score Higher Than the AN-R and BED Groups on Measures of Risk-Taking and Antisocial Traits

The Egocentricity and Stimulus Seeking subscales (of the Antisocial scale) of the PAI and the Impulse Regulation scale of the EDI-2 were used to measure this construct. The Box M test for homogeneity of variance was significant for this discriminant function analysis, $F(18) = 2.44$, $p = .001$. This was largely due to the positively skewed distributions of the previously mentioned scales and subscales. The largest variance was again associated with the largest sample size, making the analysis conservative. Therefore, a .05 level of significance was used. There were no multivariate outliers or influential data points. The test of this discriminant function indicated statistical significance for only the first discriminant function, $\chi^2(9) = 17.37$, $p = .043$ (see Figure 7). The structure matrix indicated that the Impulse Regulation (.85) scale, and the Stimulus Seeking (.58) and Egocentricity (.56) subscales contributed to the separation among the groups for this significant function. This discriminant function accounted for 83.6% of the between-groups variance.

By way of a planned comparison, the AN-B and BN groups were compared to the AN-R and BED groups on the discriminant function centroids associated with risk-taking behaviours and antisocial traits. This contrast was significant, $t(160) = 2.94$, $p = .004$, and supported the hypothesis indicating higher scores on measures of risk taking traits for the AN-B and BN groups as compared to the AN-R and BED groups (see Figure 7).

Figure 7. Significant discriminant function separating the diagnostic groups on risk-taking traits.

Hypothesis 4: a) The AN-B and BN Groups Will Score Higher than the AN-R and BED Groups on Negative Impression Management (NIM); b) The AN-R Group Will Score Higher Than the AN-B, BN, and BED Groups on Positive Impression Management (PIM)

As previously noted, Negative and Positive Impression Management (NIM and PIM, respectively) were measured using the NIM and PIM validity scales of the PAI. Homogeneity of variance was upheld, Box M: $F(9) = .94$, $p = .485$. There were no multivariate outliers or influential data points. The discriminant function analysis for this hypothesis was not significant, $\chi^2(6) = 8.60$, $p = .197$. (see Figure 8). Although not significant, the first function was a measure of Negative Impression Management (.97), while the second function was a measure of Positive Impression Management (.78). Because predictions were made a priori, follow-up contrasts were performed on the NIM and PIM discriminant functions despite the lack of multivariate significance.

Figure 8. Non-significant discriminant functions for the NIM and PIM scales of the PAI.

First, the AN-B and BN groups were compared to the AN-R and BED groups on the discriminant function centroids associated with NIM, and this contrast was statistically significant, $t(167) = 2.58$, $p = .011$. The AN-R and BED groups had lower scores on NIM than the other diagnostic groups, however all of the diagnostic groups were well above the norms on NIM (see Table 3). The second contrast compared the AN-R group to the other three diagnostic groups combined on the discriminant function centroids associated with PIM. This contrast was not significant, $t(167) = -.53$, $p = .600$. Therefore, the hypothesis regarding higher PIM scores for the AN-R group as compared to the other three groups was not supported.

Discussion

Is BED a Separate Diagnosis?

The BED group was older, had a higher BMI, showed less general psychopathology than the other diagnostic groups, but demonstrated higher elevations on general psychopathology and eating disorder symptomatology compared to the norms.

It was not surprising that the BED group was significantly older than the other three groups; this distinction has been seen in the literature before (deZwaan, 1994). Some researchers (Fairburn & Wilson, 1993) have suggested that individuals who binge eat do not appear for treatment before having gone through years of repetitive dieting and recurrent binge eating. The higher level of chronicity in the BED group compared to the other groups is consistent with this. Moreover, their problems may not be as imminently life-threatening as those associated with severe dietary restriction, laxative abuse, and self-induced vomiting, and therefore may not be brought to the attention of others as is often the case in AN and BN.

The BED group had a higher BMI than the other three diagnostic groups as found by others (Tobin et al., 1997) while, by definition, the AN-R and AN-B groups had lower BMIs. It follows that individuals with BED may also deal with complications due to obesity such as heart disease, diabetes, and arthritis (Birmingham, Muller, Palepu, Spinelli, & Anis, 1999). This issue will be revisited in the Treatment Implications section of this paper.

BED Compared to the Other Diagnostic Groups on General Psychopathology

A major finding of the present study was consistently lower, less pathological scores for the BED group compared to the other diagnostic groups on the discriminant

function for the PAI, indicating lower scores on the Depression, Suicidal Ideation, Borderline Features, Schizophrenia, and Anxiety-Related Disorders scales. These findings suggest that those with BED are in less distress than the other diagnostic groups.

The results of the present study were consistent with findings of other researchers who observed that individuals with BED reported less psychopathology compared to BN groups (Brody et al., 1994; Fichter et al., 1993; Hay & Fairburn, 1998; Tobin et al., 1997). The current study extended the comparison groups to include AN-B. Thus, there appeared to be less psychopathology in individuals with BED compared to individuals with BN or AN-B.

The BED Group Relative to the Other Diagnostic Groups on the EDI-2

When the profiles of the EDI-2 were examined for each eating disorder diagnostic group, two discriminant functions emerged. The BED group had lower scores than the other three diagnostic groups on the first discriminant function measuring Interoceptive Awareness, Perfectionism, Interpersonal Distrust, Ineffectiveness, Social Insecurity, and Impulse Regulation (see Figure 4). BN was also lower than the other two AN groups, leading to an identification of this discriminant function with AN symptoms. Other researchers have also found less eating disorder pathology in those with BED when compared to those with BN (Fichter et al., 1993; le Grange et al., 1997; Molinari et al., 1997). No studies were found comparing BED to AN samples. Again, a novel aspect of the present study was that it extended to include the AN-R and AN-B groups.

The second discriminant function analysis represented the Bulimia scale. Here, the BED group clustered with the AN-B and BN groups, while the AN-R group scored

lower. The BED group was similar to the AN-B and BN groups on the Bulimia scale that measured binge eating.

Comparing the BED Group to Norms of General Psychopathology on the PAI and Eating Disorder Pathology on EDI-2

Given the above findings, it was of interest to better understand whether the lower scores for the BED group signified the absence of psychopathology on certain scales of the PAI and the EDI-2, or whether their scores did reflect psychological distress significantly different from a normative sample. While lower than the other diagnostic groups, compared to the PAI and EDI-2 norms, the BED group was more distressed on several scales (Tables 3 and 4). Other researchers (Marcus et al., 1990; Telch & Stice, 1998) found women with BED, meeting similar age and diagnostic criteria as in the present study, had a significantly higher lifetime prevalence rate of major depression (Telch & Stice, 1998) and Axis I diagnosis (Marcus et al., 1990) than controls, thus supporting the results of the present study.

These results are clinically important ones, particularly from a treatment perspective, because they reflect the presence of some underlying distress in individuals with BED suggesting problems in areas such as affect regulation and depression, binge eating, and body dissatisfaction. These issues will be discussed further in the Treatment Implications section of this paper.

One scale for which the pattern toward lower scores in the BED group was countered was Body Dissatisfaction. This scale was significantly higher for the BED group compared to the norms of the EDI-2. Other researchers have also observed elevated Body Dissatisfaction in those with BED (Marcus et al., 1990; Raymond et al.,

1995; Striegel-Moore et al., 1998). deZwann et al. (1994) was the only study that failed to find this relationship. However, their sample included sub-criteria BED, therefore their results may not have been generalizable to full criteria BED samples.

In summary, the present results agreed with other studies (Fichter et al., 1993; Marcus et al., 1990; Raymond et al., 1995) in characterizing BED as distinct from other eating disorders and from the PAI and EDI-2 norms. Those with BED clearly had prominent binge eating symptoms that were similar in intensity to those with AN-B and BN. The lower levels of general psychopathology and lower levels of AN-related symptomatology in the BED group, as well as this group's intense struggle with a high body weight distinguished them from those with BN and AN. Moreover, the distress and symptomatology that became evident when they were compared to PAI and EDI-2 norms, separated BED as a distinct group in need of specialized treatment focusing on binge eating, affect regulation, body dissatisfaction, and obesity. These issues are discussed in more detail in the treatment implications section of this paper.

Separation of the AN-B and BN Groups from the Other Diagnostic Groups on General Psychopathology

This section focuses on the separation of the AN-B and BN groups from the other diagnostic groups, with higher scores for the AN-B group, and in some cases the BN group, on the PAI (see Figure 2). Higher scores for the AN-B group on the significant discriminant function for the PAI measuring general psychopathology, indicated that individuals with AN-B were in greater distress, and suffering from more acute depression, anxiety, as well as personality-related symptomatology (i.e., borderline personality features), than individuals with AN-R, BN, or BED.

These findings were consistent with previous research that found greater levels of general psychopathology (i.e, higher acute stress, alienation, depression, eating disorder pathology, and overall symptomatology) in individuals with AN-B as compared to those with AN-R (Edwin et al., 1988; Hurt et al., 1997; Mickalide & Andersen, 1985; Rosen et al., 1989). For example, using the MMPI, Hurt et al. (1997) found individuals diagnosed with AN-B to score higher than those with AN-R or BN on most clinical scales. Other researchers (Rosen et al., 1989) also observed more general psychopathology in the form of higher depression in those with AN-B when compared to individuals with BN.

Related to the presence of greater psychopathology in the AN-B group, is the present study's finding of greater Axis I comorbidity in this group as well as in the BN group when compared to the AN-R and BED groups. Primarily, comorbid diagnoses included major depression or another form of mood disorder, anxiety disorder, and in a few cases, substance abuse. These findings support those of other studies that found a higher lifetime comorbidity of affective disorders, and particularly depression in individuals with BN (Fitcher & Quadflieg, 1996) and AN-B (Braun, Sunday, & Halmi, 1994) compared to those with AN-R.

Corroborating the presence of greater Axis I comorbidity in the AN-B and BN groups, these individuals were also more likely than the other diagnostic groups to present with borderline personality features (see Hypothesis 1). The presence of borderline personality features has often been related to affective instability and depression, suicidal impulses, and substance abuse, thus making individuals with AN-B and BN more susceptible to comorbid diagnoses.

Separation of the AN-B and AN-R Groups from the Other Diagnostic Groups on
Eating Disorder Pathology

Two differences among the diagnostic groups are considered in this section. First, the separation of the two AN groups from the BN and BED groups on the EDI-2 is examined, and second, the separation of the AN-R group from the other three diagnostic groups is considered.

Both AN-B and AN-R groups scored higher on the first discriminant function for the EDI-2 compared to the BED and BN groups (see Figure 4). Thus, the AN-related discriminant function included the Interoceptive Awareness, Perfectionism, Ineffectiveness, Interpersonal Distrust, Social Insecurity, and the Impulse Regulation scales. Lack of Interoceptive Awareness, Perfectionism, and Ineffectiveness have been commonly associated with both subtypes of AN as marked symptoms of the disorder (Garfinkel & Garner, 1982). Symptoms such as a lack of interoceptive awareness, an inability to identify one's own feelings, needs and urges, have been described in individuals who practice severe dietary restriction (Garner & Garfinkel, 1982). Perfectionism has been linked to the obsessive-compulsive nature of the eating disorder cycle and the intense drive for thinness typically present in those with AN. This discriminant function appeared to represent an AN-related dimension of eating disorders.

The second significant discriminant function (see Figure 4), primarily a measure of binge eating, showed a separation between AN-R and the other three groups, with the AN-R group scoring lower on this dimension. This was not surprising since individuals with AN-R do not engage in binge eating or purging behaviours. Similar observations were made by Rosen et al. (1989) who found lower Bulimia scale scores for individuals

with AN-R compared to those with AN-B and BN, and similar scores on the Bulimia scale for the AN-B and BN groups. Higher scores for the BN group compared to the AN-B sample in the present study on the binge eating dimension may have reflected the AN-B group's lower frequency of binge and purging-related behaviours. Those with AN-B may tend to use more dietary restriction and exercise compared to those with BN to control their weight, and may not engage in binge eating as often as those with BN. Thus, the BED, AN-B, and BN groups clustered together on this measure and were separated from those with AN-R due to the recurrent binge eating that defines this disorder.

Specific Hypotheses

Hypothesis 1: Borderline Personality Traits

The hypothesis that the AN-B and BN groups would separate (with higher scores) from the other the diagnostic groups on variables associated with borderline personality features was partially supported. Two significant discriminant functions emerged (see Figure 5). Directly related to the hypothesis, the second discriminant function, measuring Borderline Features, Traumatic Stress, and Suicidal Ideation, showed a separation of the AN-B and BN group from the BED and AN-R groups, with the former groups scoring higher on this dimension. This discriminant function was labeled the Borderline Features dimension.

The pattern of the second discriminant function was consistent with the literature that has found AN-B and BN groups to have more of the borderline or histrionic traits (Cluster B) as compared to AN-R groups (Dowson, 1992; Herzog et al., 1992; Norman et al., 1993; Piran et al., 1988; Steiger et al., 1991).

The first discriminant function separated the two AN groups from the BED group on measures of Suicidal Ideation and Interpersonal Distrust, with the AN groups scoring higher than the BED group. On this discriminant function, the AN-B group was also significantly more distressed than the BN group. Thus, the Interpersonal Distrust scale, the only scale used in this hypothesis from the EDI-2, did not fit in with the hypothesis tapping borderline personality features, as did the other scales. Interpersonal Distrust, as measured by the EDI-2, may be more related to eating disorder psychopathology and poor overall functioning, and less related to borderline personality features. Thus, this scale may not be a good indication of borderline personality functioning. The Suicidal Ideation scale may also reflect a measure of general psychopathology and overall poor functioning that is related, but not specific to borderline personality functioning.

Several arguments have been put forward to account for greater borderline personality features in AN-B and BN samples. Attachment and family theories focus on chaotic intrapersonal and interpersonal lives. For example, problematic interactional patterns have been associated with families of those diagnosed with AN-B and BN (Johnson & Connors, 1987). The family patterns of those with BN have been described as chaotic, disengaged, hostile, negative, non-cohesive, and unempathic (Bailey, 1991; Fairburn & Wilson, 1993). Johnson and Connors (1987) have associated bulimic symptomatology with parental (particularly maternal) underinvolvement, disengagement, passivity, and rejection. They argue that attachment bonds between parent and child are strained in these families, with the child feeling unsupported (Humphrey, 1989) and insecure about the parent-child relationship. It has been suggested that bulimic symptomatology comes about as a form of self-soothing behaviour, to self-regulate mood

and feelings of neglect (Johnson & Connors, 1987). In youth, food may have powerful symbolic associations with the unavailable parent, and may be adopted by the child as a self-regulatory tool. Some research exists to support the above statements. For example, when experiencing relationship crises, individuals with bulimic disorders have been described as exhibiting more severe separation and attachment difficulties than healthy adolescents or adults in similar circumstances (Johnson, Maddeaux, Blouin, 1998). Along these lines, individuals with BN have been found to engage in typical affect regulation strategies used by insecurely attached individuals (Brennen & Shaver, 1995). These behaviours include excessive drug and alcohol use, promiscuous sexual activity, and self-mutilation, all powerful means of altering affect and cognition. Treatment considerations are further discussed later on in this section.

Hypothesis 2: Obsessive-Compulsive Traits

The second hypothesis explored the presence of obsessive-compulsive personality traits in the four diagnostic groups, predicting higher levels of these traits in the AN-R group versus the other three diagnostic groups. The analyses rendered one significant discriminant function (see Figure 6) that separated the diagnostic groups on Perfectionism, Obsessive-Compulsive traits, and Asceticism. However, the AN-B group displayed more of these traits than the BED and BN groups, while the AN-R group scored higher than the BED group. Both AN-B and AN-R groups were separated from the BN and BED groups, with higher scores on Obsessive-Compulsive traits and Perfectionism. This suggested that both AN groups combined, in comparison to the other diagnostic groups, were more likely to present with obsessive-compulsive symptomatology.

The hypothesis that AN-R would have more obsessive-compulsive traits was not supported because of the high scores of the AN-B group on these scales. This hypothesis came from literature that looked at the incidence of Obsessive-Compulsive Personality Disorder in individuals with AN (not distinguishing between the subtypes) compared to other groups. For example, Thornton and Russell (1997) concluded that Obsessive-Compulsive Personality Disorder (OCPD) tended to be a significant premorbid and comorbid disorder in patients with AN. It should be noted that the above study looked solely at inpatients unlike the present study, therefore higher rates of OCPD in their AN sample may have been due to their inclusion of a more severely ill sample. In addition, a group diagnosed with borderline features such as AN-B may have the obsessional aspects of their personality overlooked; some obsessional traits may not be as observable as the borderline symptomatology.

The findings of the present study were consistent with those of Zubieta et al. (1995) who compared three groups of individuals with AN (comparable to the AN-R group in this study), BN, and those with both AN and BN (comparable to the AN-B group in this study) on a number of measures tapping obsessive-compulsive, depressive, and eating disorder symptomatology. These authors found individuals with both AN and BN symptomatology to score higher than individuals with AN only on obsessive-compulsive traits. They also found that both AN groups were more likely to present with obsessive-compulsive traits, and thus were differentiated from the “low obsessiveness” groups, namely the BN and the eating disorder not otherwise specified groups. Thus, the findings of this study, as well as those of Zubieta et al. (1995), suggested the presence of obsessive-compulsive features in individuals with AN-B and AN-R.

A closer look showed some of the literature emphasizing the presence of obsessive-compulsive personality traits in those with AN (i.e., among those traits described were inhibition, obsessiveness, and compliance) (Dally, 1969) did not differentiate between the AN-R and AN-B subtypes. Studies done prior to the clarification of these two subtypes of AN would have combined the subtypes (Vitousek & Manke, 1994). In cases wherein the subtypes were combined, higher scores for those with AN-B may have been contributing to greater overall scores for the combined AN group.

Some studies finding greater levels of obsessiveness in those with AN-R used healthy control groups as comparisons (Rastam, 1992), rather than other eating disorder groups. Consistent with Rastam (1992), the AN-R group exhibited obsessional traits when compared to the norm but, in comparison to individuals with AN-B, those diagnosed with AN-R had fewer obsessive-compulsive traits.

Explanations of obsessional traits in AN actually apply to AN-B as well as to AN-R. Many authors have argued that social forces in Western society today, such as television, fashion, and advertisements, play a powerful role in shaping young women's attitudes towards food, weight, and body shape (Gordon, 1990; Malson, 1998; Rothenberg, 1986; Striegel-Moore, 1993). By emphasizing one type of "ideal" woman, society may promote food and weight related obsessions, particularly in females who do not naturally fit, but aspire to fit, this narrow mold. AN may be described as a form of food-related obsession in the way that before the individual reaches the point at which they lack the correct perceptions of bodily hunger cues, there is constant awareness of mild to strong feelings of hunger (Rothenberg, 1986). In addition, a persistent

preoccupation with food, in its most concrete way, seen in the rigid counting of calories, represents the individual's obsession with food and weight loss (Rothenberg, 1986). Perfection and control over temptation is often strived for through excessive exercise routines, severe dietary restriction, calorie counting, and in the cases of AN-B, repeated self-induced vomiting. The same way that non-eating disordered individuals with obsessive-compulsive traits may prefer orderliness, cleanliness and the like, individuals with AN may attempt to achieve control over weight, appetite, and thought. For example, drive for thinness, laxative and diuretic use, and amenorrhea, may all be seen by the patient as means of controlling their body (Rothenberg, 1986). In summary, the relentless focus of Western societies on food and weight loss as achievement-oriented, competitive, and necessary goals for women, further increase the need for women to control their food intake and weight through perfectionistic, rigid, and sometimes drastic means. These "obsessive" means are seen in the symptoms of AN-B and AN-R as described above.

Researchers have also suggested that naturally occurring obsessive-compulsive traits come about as a byproduct of AN and particularly, as a product of starvation (Garfinkel & Garner, 1982). When in a starved state for a prolonged period of time and ignoring one's natural urges to eat, individuals often report constant thoughts of food, and will frequently spend hours thinking about food, preparing it, or going through recipes. Several of these traits protect the individual from overeating or giving into temptation, such as irritability (leading to distraction), obsession with food, and food preparation. These traits as well as symptoms such as "spaciness" and lightheadedness, difficulty

concentrating, and hallucinations are also typical of starving people in general (Casper & Davis, 1977 in Chassler, 1994).

In summary, this study did not support the notion of a greater number of obsessive-compulsive personality traits in individuals with AN-R when compared to those with AN-B, BN, and BED, as measured by the Obsessive-Compulsive subscale of the PAI, and the Asceticism and Perfectionism scales of the EDI-2. Rather, it was observed that individuals with AN-B report these personality-related symptoms more often than do other diagnostic groups, thus supporting the notion of greater psychological disturbance in the AN-B group. Also, rather than the AN-R alone being high on obsessive-compulsive traits, findings suggested that those with AN-B and AN-R tended to be high on these traits in comparison to the BN and BED groups. These results were surprising given that the literature on clinical impressions has generally isolated a high prevalence of obsessive-compulsive traits in those with AN-R only (Dennis & Sansone, 1997; Rothenberg, 1986). It may be that obsessive-compulsive traits in individuals with AN-B are often masked by the more dramatic borderline personality features frequently seen in these patients.

Hypothesis 3: Risk-taking Traits

The AN-B and BN groups reported greater risk-taking and stimulus seeking behaviour than the AN-R and BED groups (see Figure 7). These results supported observations of other researchers (Casper et al., 1992; DaCosta & Halmi, 1992; Piran et al., 1988) who have described an increased prevalence of impulsive and risk-taking behaviours in individuals with AN-B and BN. In a review of the literature examining the utility of subclassifying AN into AN-R and AN-B, DaCosta and Halmi (1992) found that

in the six studies they looked at for impulsivity measures, individuals with AN-B were more likely to participate in theft (12.1% to 26% versus 0% to 9% found in AN-R) and alcohol and drug abuse (up to 28%). Other types of impulsivity such as suicidality and self-mutilation were also more common in those with AN-B. Converging with these findings, Piran et al. (1988) also found that individuals with AN-B were more likely to display antisocial personality disorder compared to those with AN-R, whose actions displayed inhibition. Finally, Casper et al. (1992) found those with AN-B and BN to score higher on impulsivity and danger-seeking than individuals with AN-R, while the latter group presented as more emotionally inhibited.

Traits such as stimulus seeking and risk-taking have long been associated with borderline personality features as well (Dennis & Sansone, 1997). Individuals with borderline traits have also been described as more likely to engage in activities such as alcohol and drug abuse, sexual promiscuity, theft, and other impulsive acts (Rothenberg, 1986). Risk-taking behaviours may present individuals with ways in which to regulate their affective states. Thus, it may be important for treatment of these diagnostic groups to focus on the affective regulation and coping methods involved in these eating disorders.

Hypothesis 4: Negative and Positive Impression Management

Styles of impression management were considered in the final hypothesis. It is important to note that there is a scarcity of research in the area of eating disorders and impression management, particularly where diagnostic groups are directly compared. From this perspective as well as from a treatment perspective, this hypothesis was highly relevant. Two issues were explored in this hypothesis, the first being whether a

separation among the diagnostic groups existed. The second issue was how the diagnostic groups compared to the norm. Addressing the first issue, neither of the discriminant functions was found to be significant (see Figure 8). Based on an a priori planned comparison however, the first hypothesis looking at Negative Impression Management was supported. The AN-B and BN groups displayed higher Negative Impression Management scores (NIM) than the AN-R and BED groups. In comparison to the norm however, all four diagnostic groups also scored higher than the PAI norm on NIM with a large effect size.

The results of the present study were consistent with the observations made by authors who described negative impression management techniques in individuals with BN (Raymond et al., 1995; Vitousek et al., 1991). Vitousek et al. (1991) also noted that individuals with BN encountered in a treatment setting were far more likely than those not in treatment to admit to needing help with problematic behaviours and to cooperate with attempts to understand and modify these behaviours. Higher scores in the AN-B and BN samples on the NIM scale compared to the AN-R and BED groups may reflect such a phenomenon.

Therefore, while AN-B and BN groups appear more likely to over-report symptomatology compared to the AN-R and BED groups, all four groups tended to over-report symptomatology compared to the norm. These higher NIM scores for all four groups compared to the norm may have been reflective of samples seeking treatment.

The planned comparison for positive impression management (PIM) comparing the AN-R group to the other three diagnostic groups was not supported. This comparison indicated that the AN-R group was not more likely than the BED, AN-B, and BN groups

to present an exaggerated clinically positive picture. In fact, the AN-R displayed higher scores than the norm on Negative Impression Management. Thus, they were not protective of self-disclosing, nor did they attempt to deny problems in the present treatment setting.

These results contrasted with some of the clinical observations detailed in Vitousek et al. (1991), specifying individuals with AN to be protective of their private experiences and more likely to present a favourable impression than individuals with BN. Individuals with AN have also been described as in denial of their illness, often refusing to concede that they may be in need of any help (Halmi, 1974; Vitousek et al., 1991). Moreover, some psychometric studies (Crisp, Hsu, & Stonehill, 1979; Gomez & Dally, 1980) found elevated scores on some validity scales of standardized personality inventories (i.e, Eysenck Personality Inventory, Symptom-Sign Inventory, Life Events Scale) and have inferred a generalized disposition for self-concealment among those with AN.

One reason that we may not have found elevated scores on the PIM scale compared to the norm is that the samples in the present study were comprised of individuals seeking treatment for their eating disorder. Assessment of the patient was voluntary, and understood to be a pre-requisite for treatment. Therefore, it is reasonable to suggest that those who come to an eating disorders program voluntarily have a vested interest in receiving help and thus, may be more likely to admit to problems and to cooperate with psychological testing and treatment than individuals with eating disorders in the general population.

Impression management in eating disorders is a relatively new area of research and further study is required to isolate clear patterns in impression management among the four diagnostic groups. From a clinical point of view, this type of research would enable clinicians to better interpret their patients' psychological testing, taking into consideration the effects of impression management. Moreover, isolating and understanding the individual reasons behind impression management in clients may help to clarify pertinent issues that need to be addressed in the psychotherapeutic process. From a measurement point of view, the inclusion of impression management scales in the testing procedure is vital to the correct and accurate interpretation of the inventories used to test clients.

Clinical Implications

Based on the descriptive and profile data discussed earlier, individuals with BED may present with distinct clinical and treatment issues. The significant difference in age between those with BED and the other three diagnostic groups suggests very different life experiences, values, and attitudes that need to be addressed in treatment. For example, those in early adulthood likely face different developmental issues than those who are in their mid-thirties. The significantly higher BMI of those with BED compared to the other diagnostic groups presents another important issue in treatment. The prospect of weight gain, weight loss, healthy eating habits, and the like, present different challenges for those with BED. While those with BED face the medical consequences of obesity, those with AN-R or AN-B face the medical complications of starvation and malnutrition. While creating healthy eating habits in individuals with BED involves decreasing and eliminating binge eating and emotional eating (Fairburn & Wilson, 1993), in people with

AN-R or AN-B it involves teaching how to maintain a healthy diet without restriction, over-exercise, and self-induced vomiting (Garner & Garfinkel, 1997).

Less severe general psychopathology and less suicidality in those with BED group also implied that short-term crisis intervention may not be as relevant as it would be in the other diagnostic groups, particularly those with AN-B.

When average PAI profiles were examined for each of the four diagnostic groups, the profile for the BED group (averaged across all BED patients) indicated that treatment should address the presence of low-grade anxiety, mild depressive symptomatology, somatic concerns regarding physical functioning, maladaptive coping behaviour in the face of stress, and mood lability. Important findings for the BED group on the EDI-2 implied the need for treatment to address binge eating and a high level of body dissatisfaction. In particular, the high Body Dissatisfaction scores were likely highly affected by the presence of obesity, including all of the medical and social consequences of obesity. This is different from the body dissatisfaction in the other eating disorders where there is often an element of body distortion. Results of the present study also suggested that treatment goals for the BED group are similar to those of the BN, and AN-B groups in the areas of de-escalation and cessation of binge eating and thus, acquiring of new skills for the regulation of hunger, binge eating urges, and negative mood states.

Results also suggest that, consistent with treatment implications for the other diagnostic groups, there should be an emphasis on treating affective disorders when working with a BED population. Eating disorder pathology, specifically binge eating, may be closely linked to regulation of negative mood states, particularly depression (deZwaan, 1997).

The discriminant function analyses suggested that those with AN-B had greater general psychopathology than the other diagnostic groups and eating disorder-related symptoms on both EDI-2 dimensions. Particularly striking was the combination of borderline features with high obsessive-compulsive symptoms. The latter is often overlooked, and is possibly masked by the more chaotic borderline traits. These findings suggest that AN-B is a multidimensional disorder requiring a multimodal treatment approach.

The average PAI profile for the AN-B group suggested that treatment should address the increased risk of self-harm, and displayed marked elevations for this group across several scales, leading to a severe impairment in overall functioning. Potential difficulty in placing trust in the treating professional was noted for the AN-B group, as well as a part of a more general problem in close relationships. Thus, treatment may need to focus more on initially forming a strong therapeutic alliance with these individuals so as to foster feelings of trust in the therapeutic relationship.

When the average PAI profiles for the AN-B and BN groups were examined, clinical symptomatology to be addressed in treatment focused around issues such as significant depression, instability of mood, and suicidal risk; anxiety and persistent worry; somatic complaints; and feelings of hopelessness, low self-esteem, powerlessness. Moreover, high levels of Drive for Thinness, Body Dissatisfaction (and body distortion), and Ineffectiveness as seen in the EDI-2, placed these individuals at further risk of continuing the eating disorder cycle. The combination of mood and eating disorder symptomatology in these patients may potentially increase these patients' reluctance to

comply with treatment that is typically centered around healthy weight gain and the maintenance of a normal BMI.

Difficulties in the areas of interpersonal distrust, negative relationships, and social insecurity for the AN-B and BN groups signified potential problems in establishing, maintaining, and feeling secure in intimate relationships. Moreover, the PAI average group profiles for the AN-B and BN groups indicated that treatment should address the quality of current close relationships and social support, as well as dissatisfaction with these relationships. It should be noted that while these patients may initially feel quite motivated towards treatment (as detailed in the average profiles), it might take some time for these patients to feel comfortable and safe in the therapeutic relationship, particularly in the candid discussion of feelings.

Related to relationship and trust issues is the issue of sexual abuse and trauma in individuals with eating disorders, particularly those with AN-B and BN (Brownell & Foreyt, 1986). The average PAI group profiles for the AN-B and BN groups in the present study indicated that these groups might have experienced a disturbing traumatic event in the past that continued to cause distress and produce anxiety in the present. Thus, treatment should be prepared to address issues of sexual abuse, when the client is ready to address them.

Discriminant functions associated with AN-related symptoms suggested similar treatment issues for the AN-B and AN-R groups. Therapy might address high levels of asceticism and lack of interoceptive awareness in psychotherapy with these individuals, so as to foster healthy awareness of internal bodily states, and allow the patient to learn how to interpret and accept bodily needs. Moreover, feelings of depression,

worthlessness, identity confusion, and ineffectiveness may be lessened by treatment that encourages and works with individuals to help them understand and reprocess the feelings underlying their eating disorder. Along these lines, Friedman (1985) suggested that the goal of therapy would be to connect women with AN-B and BN to their natural spontaneity, which is typically repressed along with urges, feelings, and needs in favor of presenting an “ever-pleasing” persona.

While all eating disorders have certain core features in common, this study has pointed to important diagnostic, clinical, and treatment-related differences between those with BED and the other three diagnostic groups that suggest benefits to the development of a separate treatment program for those with BED. Throughout this section some of the features of BED that make it a distinct disorder were illustrated. Due to the higher age and body weight, distinct symptom presentation, and milder psychopathology prevalent in BED versus the other disorders, treatment with individuals with BED may be sufficient on a less intensive, outpatient basis. This treatment would be geared toward helping patients to reformulate their emotional relationship with food and battle feelings of anxiety and depression.

The AN-B group was also singled out in the present study. Individuals in this group displayed a high level of general psychopathology including borderline features, combined with problems associated with AN-related symptomatology, such as high levels of Interoceptive Awareness, Perfectionism, and Ineffectiveness. This group also displayed a high level of obsessive-compulsive traits. This combination of chaotic behaviours and obsessive striving is particularly difficult and distressing for the individual.

Measurement Issues

The use of the EDI-2 with the BED sample presented some measurement problems. The principle concern was that the issues being tapped on the EDI-2 were distinct from those of concern for individuals with BED. For example, questions regarding Maturity Fears and Drive for Thinness may not have been reflective of the experiences associated with BED who present as older and with a higher weight than other eating disorder groups. Moreover, although the BED group did show elevated Body Dissatisfaction compared to both sets of norms for the EDI-2, these elevations may not be rooted in body distortion as they are for AN and BN groups.

In addition, the items and scales of the original EDI (Garner et al., 1983) were based on anorexic and bulimic symptomatology, with the norms for the eating disorder groups originating from samples of college-age adults with AN-R, AN-B and BN (Garner, 1991). Therefore, the items and norms may not be generalizable to individuals with BED who are older than other eating disorders groups. For example, responses to questions such as, “I wish that I could be younger” and “I feel that I really know who I am” may be affected by the individual’s age and may mean something quite different when endorsed by adults that are older (i.e, BED sample) versus adolescents or younger adults (AN-R, AN-B, BN samples). Similarly, questions such as “I think my stomach/hips/thighs/buttocks are too big”, “I think about dieting”, or “I am preoccupied with the desire to be thinner” may have different interpretations when endorsed by those with BED as compared to those with AN or BN. In other words, the desire to diet and become thinner, or the dissatisfaction with a body part is a fundamentally different experience for someone who has a BMI of over 30 and suffering from the medical

complications of obesity compared to someone who has a BMI of below 17.5. This example also illustrates the difference in body distortion between those with BED and those with AN or BN. The former group typically would like to be thinner than they are, but do not usually desire an unrealistically slim body weight. Individuals with BN and particularly AN, vehemently pursue an overly thin “ideal” often to the point of malnourishment or emaciation. This desire for a slim “ideal” was observed in the elevated Drive for Thinness scores of the AN and BN groups. Although the BED group was more elevated than the female college norms on Drive for Thinness (see Table 4), when they were compared to the eating disorder norms, their scores were below the norms, indicating less of a Drive for Thinness compared to other eating disorder groups.

Therefore, it seems reasonable to suggest that accurate comparisons between those with BED and either college or eating disorder norms of EDI or EDI-2 would be questionable. However, it was still relevant to compare the BED group to the norms of the EDI-2 to see how they did compare to norms based on AN and BN samples. Future research could focus on developing an eating disorder scale or sets of scales specifically tapping concerns that may be central in BED such as complications due to recurrent binge eating without purging, disinhibition, dieting, affective control problems, obesity, health concerns, social stigmatization, and the like. It would also be beneficial to an understanding of BED if there were age-matched normative samples data available for the EDI-2.

Finally, in the measurement of Axis I comorbidity, the present study did not differentiate between primary and secondary comorbidity, as this inquiry was beyond the scope of the study. Whether the comorbid disorder precedes or is a byproduct of the

eating disorder is a complex issue. In the latter case, if the eating disorder is successfully treated the comorbid disorder may disappear as well.

Limitations of the Study

Because one of the hypotheses centered around obsessive-compulsive traits, it would have been beneficial to include another measure that exclusively tapped these types of personality traits. The Obsessive-Compulsive subscale of the PAI was a combined measure of Obsessive-Compulsive Personality traits (OCPD) and Obsessive-Compulsive Disorder symptoms (OCD). It would be of interest to sort out the extent to which the AN-B group was high on Obsessive-Compulsive Personality disorder traits as compared to Obsessive-Compulsive Disorder traits.

Because most of the participants were voluntarily seeking treatment for their eating disorder, they are not representative of non-clinical, community-based samples or of individuals that are forced into treatment by a referring source (i.e, certain child or adolescent samples). Some discrepancies in the literature may have resulted from this difference, particularly on Negative and Positive Impression Management scales.

Finally, healthy controls were not included in this study. Instead, comparisons with the norms of the PAI and EDI-2 were used to determine effect sizes for each eating disorder group. The EDI-2 norms were for younger individuals than those in the present study, particularly the BED group. In addition, the PAI did not present separate male and female norms; since the sample in the present study was female, psychopathology compared to other females may be overestimated. The following section looks at potential directions for future research.

Future Research

As previously suggested, the development of a specialized measurement tool for BED would greatly increase the ability to explore the distinct qualities of this novel diagnosis, and would identify necessary directions for treatment for those with BED. In addition, a tool such as this would distinguish those with BED from those with other overeating and bulimia-spectrum disorders. This would improve research into the etiology of BED and associated risk factors.

Further research into treatment outcome evaluation and process for those with BED would be valuable to a better understanding of how to treat this disorder. The present study addressed potential issues for the treatment of those with BED only briefly. Although there is some research looking at treatment for BED (Wilfley, Agras, Telch, Rossiter, Schneider, et al., 1993), it would be clinically relevant to continue to compare various forms of psychotherapy (i.e., interpersonal, emotion-focused, etc.) in a BED sample to better understand how to treat this new disorder.

With regards to research on AN-R, AN-B, and BN, further study is required into some of the different treatment needs of these diagnostic groups. Results of the present study supported the notion of these eating disorders as multidimensional disorders requiring a multimodal treatment that takes into consideration a broad range of general psychopathology and eating disorder symptomatology, as well as numerous risk factors.

It would be beneficial to the further distinction of these four eating disorder groups to compare them to healthy controls instead of norms. In addition, it would be relevant to the treatment of these eating disorders groups to compare negative and

positive impression management in voluntary patients to individuals not seeking treatment.

Finally, future research could explore the relationship between childhood affect regulation and current disordered eating patterns to better understand the nature of early relationships with food, mood regulation, and interpersonal relationships.

Contributions of the Present Study

The present study was the first known study to systematically explore and differentiate groups of individuals with BED, AN-R, AN-B, and BN on a series of variables related to general psychopathology, personality, and eating disorder symptomatology. Differentiation among the diagnostic groups was accomplished in a number of ways. The first differentiation among the diagnostic groups occurred on a profile level with the use of discriminant function analyses. Essentially, the kind of separation that occurred among the diagnostic groups depended on whether they were being compared on general psychopathology and personality symptomatology or eating disorder pathology. Individuals with AN-B tended to suffer from the highest degree of general psychopathology, while the BED group displayed the least amount of general psychopathology in comparison to the AN-R and BN groups. The AN-B and AN-R groups had higher AN-related pathology compared to the BN and BED groups, and those with AN-B, BN, and BED were more severe than those with AN-R on binge eating symptoms.

Another novel aspect of the present study was related to second level of differentiation. In order to explore BED's distinction as a separate diagnosis, they were compared to the normative values available for the PAI and EDI-2. More distressed

scores compared to the norm on the PAI and EDI-2 indicated that individuals with BED were experiencing a clinically important degree of psychopathology requiring systematic treatment. Differences between the BED group and the other groups as well as the PAI and EDI-2 norms, supported the notion of BED as a separate, diagnosable disorder that would benefit from a specialized treatment program.

Finally, the third differentiation among the diagnostic groups involved the separation of these groups on four sets of specific personality variables. Again, this was the first known comparison of the AN-B, BN, AN-R, and BED groups on borderline personality traits, obsessive-compulsive traits, impulsive traits, and impression management styles. It was clinically important to explore personality-related issues in these groups, so as to gain a better understanding of what treatment issues may be most salient in treating each diagnostic group.

In each step of the differentiation process, the discriminant function analysis procedure contributed a novel way of looking at this type of research. Previous research has typically used a univariate approach to looking at both general and eating disorder-related psychopathology in a way that eating disorder groups were compared on individual scales rather than on groups of scales or dimensions as in discriminant function analysis. Thus, the approach the present study took was not only able to compare the diagnostic groups on specific scales and on severity of illness, but it was able to separate the groups on specific dimensions, taking into consideration a cluster of related scales measuring a broader construct.

Another novel design issue in the present study was the use of the PAI with an eating disorder sample. This was the first study to use the PAI with an eating disorder

population. It was quite useful in its ability to isolate the most symptomatic diagnostic groups. In addition, compared to previous studies that utilized the MMPI or MMPI-2 with eating disorder samples (Edwin et al., 1988; Hurt et al., 1997), the PAI provided more updated items, nonoverlapping scales, and tapped a broad range of symptomatology and personality-related traits commonly found in eating disorder patients.

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