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A Comparison of Binge Eating Versus Dieting Onset in Bulimia Nervosa

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A Comparison of Binge Eating Versus Dieting Onset in
Bulimia Nervosa

A THESIS
The Honors Program
College of St. Benedict/St. John's University

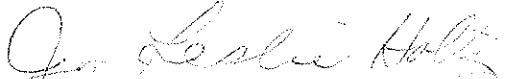
In Partial Fulfillment
of the Requirements for "All College Honors"
In the Department of Psychology

by
Carrie J. Fenna
May, 1995


For my parents

A Comparison of Binge Eating Versus Dieting Onset in Bulimia Nervosa


Project Advisor:

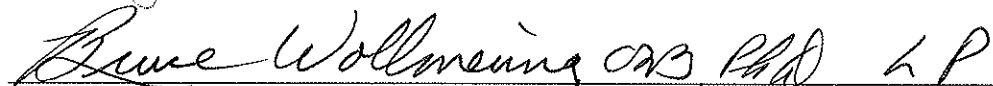

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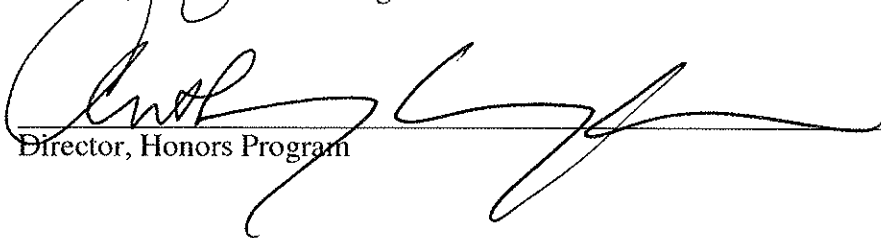

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**A Comparison of Binge Eating Versus
Dieting Onset in Bulimia Nervosa
By: Carrie J. Fenna**

Bulimia is recognized as far back as Hippocrates. It was defined as *boulimos* which means a sick or ravenous hunger. Ancient authors recognized *boulimos* as episodes of overeating that were triggered by an unusual form of hunger (Stunkard, 1993). In 1743 an author named James described true boulimus as intense preoccupation with food and overeating at short intervals followed by fainting and vomiting. At the turn of the nineteenth century bulimia was linked to binge eating and was included in the 1797 edition of the *Encyclopedia Britannica*. The current understanding of bulimia was first described by Boskind-Lodahl and White in 1973 in a paper that described vomiting and binge eating in normal weight people. Bulimia was then officially entered into the DSM-III-R with a formal diagnosis in 1987 (Stunkard, 1987).

In the past few decades there has been an increase in the research and treatment of eating disorders. The most recent definitions of two disorders known as bulimia (BN) and binge eating disorders (BED) are present in the DSM-IV. The information on BED in the DSM-IV is based on research that is in progress. Therefore the diagnosis is based on research that is currently being investigated but not officially accepted into the manual. This disorder is associated with individuals who are obese and participate in regular binge eating activity without purging. They are also affected by weight fluctuations, and preoccupation with weight and shape (Marcus, Wing & Hopkins, 1988; Wilson, 1993). These individuals met the previous criteria for bulimia which included binge eaters who purge and those who do not because of their preoccupation with weight and binge eating

behaviors (Marcus, 1990; Marcus et al., 1988; Prather R.C., Williamson, D.A., 1988). In the DSM-III-R edition, however, bulimia was changed to BN and no longer included the obese binge eaters who do not engage in compensatory behaviors and who were later defined as BED. Studies have indicated these individuals are similar to normal weight bulimics in every scale except dietary restraint in which they score lower (Marcus, M.D., Smith, D., Santelli, R., & Kaye, W., 1992; Wilson, 1993). The BED group also has lower rates of psychopathology on the eating disorders inventory (EDI) as compared to BN subjects (Raymond, N., Mussell, M.P., Mitchell, J.E., Crosby, R.D., in press).

The second eating disorder known as BN is categorized according to three criteria. These include recurrent episodes of binge eating, extreme behavior designed to control body shape and weight, and over concern with shape and weight, based on self-evaluation (Fairburn & Wilson, 1993). The extreme behaviors include self-induced vomiting, excessive exercise, extreme dieting or fasting, and the use of laxatives and diuretics. Individuals with BN may or may not be participating in purging behaviors. An individual with BN participates in recurrent episodes of binge eating.

There are several similarities between individuals diagnosed with BN or BED. Persons suffering from BED and BN eat in a discrete amount of time an amount of food that is definitely larger than most people would eat during a similar period of time in similar circumstances. These individuals also experience a lack of control over eating during the episode. Binge eating is not confined to any one eating disorder; it fits across all eating disorder categories (Fairburn & Wilson, 1993). This study deals with women who have been diagnosed with BN and also makes some comparison with women who are diagnosed as BED.

In recent years there has been an increase in studies done on individuals with eating disorders. One of the first recorded studies on starvation and its influence on individual

physical health and personality was the Minnesota Experiment (Hsu, 1990). Thirty-six healthy males of normal weight in their twenties were selected for this study. For twelve weeks they were allowed to eat three meals a day, totaling 3400 calories a day. After the twelve week period a twenty-four week period ensued in which the men could eat only two meals a day totaling about 1500 calories. The results were extraordinary. For example, the men became preoccupied with thoughts of food. All of the men reported feelings of lethargy, poor concentration, loss of sexual interest, increased irritability, moodiness and insomnia. At the end of the twenty-four weeks they began a six week rehabilitation period in which they could eat more calories every week. It took an average of twelve weeks for the men to get back to their normal weights and eating patterns. During this period they tended to eat past the point of feeling full and were still preoccupied with food. This study clearly indicates that altering food intake has noticeable affects on an individual.

An important question to address is why certain individuals start on the path towards eating disorders. Eating disorders usually affect young Caucasian females from the middle to upper social classes in developed countries. Populations in developed countries would obviously be more concerned with dieting behaviors because they have the food available to become overweight. An increase in the incidence of eating disorders has occurred primarily among women between the ages of 15 to 24. There has been no change for women in other age categories nor for men. Therefore dieting in developed countries may be prompted by an increase in fatness in the population coupled with a desire among younger women to be thin. It would make sense that the population is becoming fatter, because of the abundance of food in developed countries as well as a decrease in infectious diseases. Body weight increases as the standard of living increases.

Another question to address is why young Caucasian females develop such disorders while young minority girls in the lower financial classes do not. The answer to

this question may be two fold. The first explanation is that children who are living at the poverty level are fighting so hard to survive that issues such as thinness are not important in their lives, "In the classes at Audubon, [an inner city school in San Francisco] issues of gender are often subsumed by issues of basic humanity" (Orenstein 1994, 137). The second answer may lie in the culturally different upbringing of Caucasian and African American girls. Caucasian girls are exposed to a historical European ideal of female submissiveness, delicacy and innocence whereas African American girls are exposed to a history of strength and a "tenacious sense of self" (159). "Black girls, have higher overall self-esteem than white girls: They feel a greater sense of personal and familial importance, more entitlement to speak out, and are more satisfied with their appearance . . ." (159). This is seen in a testimony from a thirteen year old African American girl named Dashelle when asked if she is concerned about being overweight, "It don't affect me none to be healthy, my mother and my sisters-we're all healthy. It's not my body that's going to get me somewhere, it's my brain" (231).

This leads one to ask, why is it that Caucasian girls do not feel this same sentiment? Caucasian girls are generally given more academic opportunities and score well on national tests. This fact should be a source of self-esteem and confidence for these girls, and yet it is not. "Girls with healthy self-esteem have an appropriate sense of their potential, their competence, and their innate value as individuals. They feel a sense of entitlement: license to take up space in the world, a right to be heard and to express the full spectrum of human emotions . . ." (Orenstein 1994, 9). It is apparent that many young Caucasian girls do not have a healthy sense of self-esteem and are judging themselves on the basis of their appearance. This obsession with appearance includes a preoccupation with eating and dieting that often precedes eating disorders, indicating that eating disorders may also be categorized as a developmental disorder. A 1986 study concluded that 80% of fourth grade

girls in the San Francisco Bay Area were watching their weight. In 1987 Rosen and Gross studied 3000 adolescents and found that most boys were trying to gain weight, but two-thirds of the girls were trying to lose weight (Fallon, Katzman, & Wooley, 1994, 26). As girls mature they increase in body fat. Body fat is considered undesirable by their peers and the culture in general (Fallon, Katzman, & Wooley, 1994). This can lead to an early concern about body weight and body image that may result in dieting behaviors. Another adolescent example was a survey conducted in 1984, with girls between the ages of 11 to 17. Given three magic wishes for anything they wanted, the girls' number one wish was to "lose weight and keep it off" (Fallon, Katzman, & Wooley, 1994). Studies have also shown adolescence girls to experience more anxiety, insecurity and self-consciousness than boys. These characteristics are risk factors for developing an eating disorder. Personal dissatisfaction may increase the chances that a girl will seek attractiveness by dieting and striving to fulfill the cultural ideals of beauty. In fact, most patients can recall the event that made them feel as if they needed to lose weight. Some examples include being teased for being fat by peers, sexual conflicts, or family difficulties (Hsu, 1990).

The female to male ratio of the disorder is 10:1 (Hsu, 1990), indicating a strong gender discrepancy. One reason for this may be sociocultural. The ideal female figure in our culture violates the natural tendencies of the normal female body. Studies have shown that body weight resists change because it is physiologically defended at a set point. For most women the set point is higher than the current cultural ideal (Herman & Polivy, 1993). The ideal female weight, as determined by actresses, models, and Miss Americas, has decreased over the years until it is now the thinnest 5-10% of American women (Fallon, Katzman, & Wooley, 1994). In addition, a lean, muscular form is more easily obtained by men than by women. For women, fashion and beauty are intertwined. Women's fashions

dictate a body that is thin. An example would be the miniskirt which reveals the leg and much of the thigh.

Girls in this culture are being exposed to the superwoman ideal. A superwoman is a woman who does it all. For example, she has a career, family, beauty, and thinness. Girls who internalize the superwoman ideal score significantly higher on the Eating Attitudes Test (EAT) than girls who set more realistic goals for themselves. The EAT is a testing device to determine the extent of a person's eating disorder, and a high score indicates a severe problem with an eating disorder. The more a female defines herself by her physical appearance and her relationships with others, the more vulnerable she is to developing an eating disorder (Striegel-Moore, 1993). In one study groups of men and women were given nine figure drawings. The subjects were asked to rate the nine figures based on which figure resembled their current figure, which was the ideal and which was the most attractive to the opposite sex. The men generally chose one figure for all three criteria. Women chose the heaviest figure as their current figure, the next heaviest was the most attractive, followed by the ideal. Therefore, their ideal figure was even smaller than what they considered to be the most attractive to men. (Hsu 1990). All of this indicates that there is a sociocultural emphasis on slimness that is prevalent in western cultures, and that it is a major component in the development of eating disorders in our society. "In women more than men, physical attractiveness is related to how an individual is evaluated by her peers, the quality of her peer relationships, and her personal prestige" (Hsu 1990,83).

Despite the Superwoman ideal, it is apparent that females in our culture are feeling a lack of power, choices and control over their lives. When a class of sixth graders were asked to swap genders these were the results, "almost all of the boys' observations about gender swapping involve disparaging "have to's, whereas the girls seem wistful with longing. By sixth grade, it is clear that both girls and boys have learned to equate maleness with

opportunity and femininity with constraint" (Orenstein 1994, 3). Changes need to be made in order to combat these sociocultural influences. Girls need to start looking at themselves with respect and to demand to be treated as a person and not an object. They need to ask themselves what they want out of their lives and start pursuing their own goals and dreams, goals that have nothing to do with what they look like physically. We need to start educating young females to be independent and to be proud of being female. These are lessons that young girls need to start learning, both in school and at home.

A family history of affective illnesses in individuals with eating disorders suggests that there may be a biological or psychological vulnerability predisposing the dieting individual to develop an eating disorder (Hsu, 1990). Some of the major factors in the etiology of BN are having a family history of eating disorder, affective disorder, substance abuse, obesity, or sexual abuse (Fairburn, Hay & Welch, 1993). Other psychological factors may include family personality traits, disturbed family relationships, and parental concern with body shape (Hsu, 1990). Daughters of mothers who are critical of their weight are more likely to diet. Mothers who diet are also much more likely to have daughters who will diet and subsequently participate in eating disorder behaviors. It has also been found that fathers who are preoccupied with dieting will more often have a daughter who is trying to lose weight (Striegel-Moore, 1993).

The BN cycle of fasting, purging and binge eating generally takes one of two formats. Over 80% of those classified with BN follow the first pattern, i.e., they utilize self-induced vomiting to get rid calories and feelings of fullness after binge eating. The second group vomits to accelerate weight loss and the binge eating develops afterwards. Some of the triggers that result in binge eating behaviors include tension or anxiety, boredom, loneliness, being frustrated, feeling rejected and anger . Many individuals with BN claim

that they are more likely to begin a binge either when they are alone or when they are in a social situation with large amounts of food (Hsu, 1990).

Binge eating most often takes place in an individual's own home, usually in front of the television or in the kitchen (Hsu, 1990). Usually within thirty minutes of binge eating the individual will be overcome with feelings of guilt and fear of gaining weight along with disgust at their actions. The binge eater will subsequently feel incredibly full and resort to vomiting or laxative abuse (Hsu, 1990) less than two hours after the binge eating was terminated. Individuals usually choose food that is ordinarily restricted, easily digestible, and that has a high caloric content such as ice cream, chocolate bars and cookies (Root, Fallon, & Friedrich, 1986). The typical patient does not eat normal meals. She eats very little or nothing at all in the morning; but starting in the mid afternoon, she will binge eat up to 5000 calories over the course of the evening. Some patients eat continuously whenever they are near food (Yager, 1986).

There are some secondary characteristics that are common in individuals suffering from BN. These include substance abuse with alcohol, drugs, diet pills, amphetamines or caffeine. There is also evidence of problems with shoplifting and suicidal behaviors. Some common psychological features include experiencing a sense of powerlessness, numbness to feelings of anger, fear or anxiety, depression and mood swings, low self-esteem, hypersensitivity to criticism and approval, obsession with appearance and weight, a lack of close intimate relationships, and social withdrawal (Root, Fallon, & Friedrich, 1986). Depression is a major characteristic of patients with BN. It is difficult to determine if the depression preceded the BN or if the individual is developing a depression in response to their purging behaviors, secrecy, and low caloric intake. Approximately one-third of the patients seen in one clinic had serious character problems. These problems consisted of self-absorption, selfishness, impassivity and compulsivity (Yager, 1986).

People diagnosed with BN are often searching for an identity. They tend to define themselves by their appearance, achievements, and by people's reactions to them. They are prone to describing themselves by their achievements and they spend a lot of time and energy trying to obtain the approval of other people. Considerable time is also spent trying to figure out the right decision, or the right answer. Therefore, individuals with BN may be very tuned into the people around them, but they are unable to determine what they want or need for themselves (Root, Fallon, & Friedrich, 1986). They can be likened to a pendulum alternating between being in strict control and being totally out of control. Relationships and painful feelings may be beyond their control, so they attempt to control their appearance and weight, even tolerating the physical maladies that occur as a result of binge eating behaviors. Some of these physical discomforts include feeling extremely cold, painful digestion, dehydration, dental problems, and irregular menstruation. Dental problems include enamel erosion and increased cavities.

There are many different methods for treating BN. These methods may include individual or group therapy and medication. The classic individual behavior therapy includes self-monitoring, targeting, graphing, and positive or negative reinforcements. Therapy generally includes 12 to 40 sessions over a 3-to-10 month period. Research supports some practices that work well in the treatment of BN. These include keeping journals and diaries, participating in normal meals, patients' self-analysis of beliefs and attitudes, insight-oriented corrections of distortions, substituting better coping mechanisms, contracts and mental imagery (Yager, 1986).

In group therapy, group activities can be utilized such as weekly goal contracting and role playing with assertiveness training. People in a group may benefit from knowing they are not alone and from witnessing the successes of other patients. They may also gain insights and ideas from the experiences of the other people in the group. However, group

therapy is only recommended in concurrence with individual therapy. In addition, patients who have borderline personality disorders should not participate in groups due to the magnitude of their other psychological problems (Yager, 1986). Some evidence exists that drug therapies utilizing anticonvulsants, and antidepressants work on certain patients. This is an area of eating disorder research that is continuing to expand.

Although progress has been made in the search for information about the causes of eating disorders, much remains unknown. More research is needed that explores the physical and psychological mechanisms underlying BN. One such area of study involves what causes individuals to first start binge eating behavior. It is widely believed that in the bulimia nervosa (BN) population, the majority of affected individuals begin to significantly reduce food intake prior to the onset of binge eating (for a review, see Polivy & Herman, 1985; Davis, Freeman & Garner, 1988; Wilson, 1993). It is hypothesized that a cycle develops in which food restriction produces intense hunger, which in turn precipitates the binge. In addition, violation of strict food rules may also precipitate binge eating (Wilson, 1993). The widely studied application of cognitive-behavioral therapy (CBT) to treat BN (Fairburn & Cooper, 1982) and binge eating in general (Fairburn, Marcus, & Wilson, 1993) is based on the premise that dieting predisposes certain individuals to binge eating. Therefore, the initial focus of treatment is to stabilize eating patterns by introducing regularly scheduled meals and snacks in an attempt to eliminate dieting and thereby diminish binge eating and consequent purging behavior. In contrast to this widely held hypotheses, recent reports indicate that a significant proportion of individuals suffering from BED, who binge eat but do not engage in compensatory behaviors do not report dieting before the onset of binge eating (Abbott et al, in submission; Marcus, 1993; Mussell et al., in press; Raymond, Mussell, Mitchell, Crosby, & Zwaan, in press; Spitzer et al., 1993; Wilson et al., 1993).

This study was undertaken to examine the prevalence of the patterns of binge eating and dieting onset among normal weight women with BN. In reviewing the literature, estimates of the proportion of bulimic women reporting an onset of dieting prior to binge eating or who were on a strict diet when they began binge eating range from 49% to 56% (Borman-Spurrell, Wilfley, Tanofsky, Ryan, & Brownell, 1994; Spitzer, 1993). Based on these past findings I hypothesized that a greater proportion of BN women would report dieting prior to the onset of binge eating, and a lesser proportion would report binge eating prior to dieting. The second purpose of this study was to investigate clinical differences in a sample of bulimic women based on the distinction of whether dieting preceded binge eating or the reverse. It was hypothesized that binge eating among BN women whose binge eating onset came before initiation of dieting might be associated less with desire to lose weight, and more with other triggers, such as a depressed mood. I predicted that subjects who developed binge eating prior to dieting would exhibit higher levels of depressive symptomatology and show more signs of compulsivity. They would also report less concern about weight and shape and have higher weights than bulimic subjects who reported dieting before the onset of binge eating. I also investigated potential differences in response to treatment between the two groups.

METHODS

Subjects:

Data were drawn from data bases used in two previously reported BN treatment studies (Mitchell et al., 1990; Mitchell et al., 1993). Potential subjects for both treatment studies included female outpatients being evaluated in the Eating Disorders Clinic at the University of Minnesota and respondents to advertisements in a local newspaper. Eligibility for the first study, a comparison of group cognitive-behavioral therapy (CBT) to antidepressant treatment (Mitchell et al., 1990), required female subjects to be 18 to 40 years of age, within normal body weight range (i.e., 80% to 120%; Metropolitan Life Insurance Company), and to meet DSM-III criteria for bulimia. The second study, which was a group CBT comparison of emphasis on abstinence versus intensity of treatment, (Mitchell et al., 1993) included female subjects at least 18 years of age, within 15% over or under their ideal body weight, who fulfilled DSM-III-R criteria for BN. Both studies required additional criteria of binge eating along with self-induced vomiting or laxative abuse at least 3 times a week in the 6 months preceding evaluation. Subjects were excluded who were involved in current psychotherapy or pharmacotherapy for BN, had a medical condition contraindicative to safe outpatient treatment, or who were actively abusing drugs. The total number of subjects was 226. For the purpose of the present study, 43 of these subjects were excluded, 5 (2.2%) who denied a history of dieting and 38 (16.8%) who indicated the same age of onset of binge eating and dieting. Therefore, 183 subjects remained in the sample pool of subjects. The mean age of the sample was 26.1 (± 6.1 ; range of 18 to 43) years, with no significant difference between the means of the BF (27.7 ± 6.4) and DF (24.6 ± 5.8) groups, $t(38)=1.58$, $p < .123$. The sample consisted primarily of women who were Caucasian (95%; one American Indian subject). The majority of

subjects had never been married (70%; 28 out of 40) and had attended college (75%; 30 out of 40). Table 1 shows that no significant differences were found between groups on any demographic variables.

Procedure:

Measures of Eating Disorders. The Eating Disorders Questionnaire (EDQ; Mitchell, Hatsukami, Eckert, & Pyle, 1985) is a self-report instrument consisting of 110 questions on a 5 point scale ranging from "never" to "often" in describing eating related behaviors. Selected items from the self-reported Eating Disorder Questionnaire (EDQ) were used to assess weight, dieting behaviors, binge-eating behaviors, purging behaviors, and other various attitudes toward body perception and self-perception. The second measure of eating disorders administered was The Eating Disorders Inventory (EDI; Garner, Olmstead, & Polivy, 1983). This 64-item instrument measures behavioral and psychological traits associated with anorexia nervosa and BN. It consists of a 6 point scale ranging from "never" to "always", and it measures a variety of attitudes, about food, eating behaviors, and individual feelings.

Measures of Depression. Symptoms and severity of depression were assessed using the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), a 21 item self-report questionnaire and the 24 item clinician administered Hamilton Depression Rating Scale (HDRS; Hamilton, 1960).

Clinical Measures. All subjects had been evaluated for eligibility for the treatment protocols by one of the study investigators. The evaluation included a psychiatric clinical interview to assess eating disorder pathology and comorbid psychopathology. Baseline self-report inventories were completed prior to entering the treatment phase. Psychiatric diagnoses were assessed by clinicians experienced in the area of eating disorders using an unstructured clinical interview and a checklist to derive DSM-III or DSM-III-R diagnoses.

Additional information regarding procedures beyond those necessary for the present study are reported elsewhere. (Mitchell et al., 1990; Mitchell et al., 1993).

Analysis:

For the present analysis, two subsets from the 183 - subject pool were identified based on responses to what age they were during onset of binge eating and dieting on the EDQ. The subjects who reported dieting first were categorized as the "diet first" (DF) group. The subjects who reported "binge eating" (BF) first were categorized as the binge first group. Cases were excluded due to ambiguity if the age of onset of binge eating and dieting behaviors were reported in the same year. The percentage of DF and BF subjects were then determined.

To compare clinical characteristics of the DF and BF subgroups, it was necessary to have the same number of subjects in each group. Because there were only 20 individuals who had binged first, we selected 20 individuals from the larger number by using a table of random numbers. T-tests and χ^2 were then used on the two subgroups of 20 for further statistical analysis. After the statistical analysis, a final comparison was then made between the two BN subgroups and previous findings from other studies dealing with individuals with BED.

RESULTS

Description of sample:

A total of 158 (69.9%) subjects were categorized Dieted First: 63 (76.8%) subjects from the CBT-antidepressant study and 95 subjects (66.0%) from the group therapy sample. The data on 20 subjects from the entire sample (8.8%) were categorized as Binged

First: 4 of 82 (4.9%) subjects from the CBT-antidepressant sample and 16 of 144 (11.1%) subjects from the group therapy sample.

Comparison of the two groups found significant differences between groups for mean Body Mass Index (BMI), with the binge first group $22.96 \pm 2.5 \text{ kg/m}^2$ weighing more than the diet first group $20.06 \pm 2.0 \text{ kg/m}^2$, $t(37)=4.03$, $p \leq .001$. There were no significant differences between the two groups on measures of binge eating, vomiting, laxative use, days of abstinence or time spent binge eating.

EDQ:

As indicated in Table 2, the mean weight reported by the BF group was 136.8 (± 14.3) pounds (lbs.), which was significantly higher than that reported by the DF group 111.5 (± 10.2) lbs., $t(36)=6.20$, $p < .001$. The BF group also reported a significantly higher mean desired weight (123.0 ± 10.1 lbs.) compared to the DF group (103.94 ± 8.5 lbs.), $t(36)=6.25$, $p < .001$.

No differences were detected in reported mean number of meals eaten per day, $t(38)=1.68$, $p < .101$; however, the BF group reported consuming significantly more snacks per day than the DF group, $t(35)=2.10$, $p < .043$. The BF group reported significantly higher mean scores (indicating more negative attitudes) about their perceived current weight compared to the DF group, $t(38)=2.48$, $p < .018$. No differences were found in perceived weight as a child, $t(38)=0.90$, $p < .374$, nor in being teased about weight as a child, $t(36)=-0.93$, $p < .359$. No significant differences were reported for degree of body proportion dissatisfaction, $t(38)=0.60$, $p < .551$, or fear of becoming "fat", $t(38)=-0.19$, $p < .856$. There were no significant differences between the groups in feelings regarding a 2 lbs. weight gain or weight loss (see Table 2).

The BF group reported a significantly later age (17.7 ± 3.9 years) at which they began to first restrict food intake compared to the DF group (14.9 ± 2.1 years),

$t(29)=2.92$, $p<.007$, and a significantly younger mean age of binge eating onset (13.5 ± 4.3 years) than the DF group (17.8 ± 3.2 years), $t(38)=-3.54$, $p<.001$. Reported onset of laxative use was significantly later for the BF group (24.5 ± 7.3 years) compared to the DF group (19.4 ± 3.7 years), $t(24)=2.32$, $p<.029$. The BF group also reported a later mean onset of vomiting (18.8 ± 3.5 years) and use of diet pills (17.7 ± 4.5 years) compared to the DF group (17.0 ± 5.2 and 15.2 ± 1.2 years, respectively), although differences on means of these variables did not reach significance, $t(38)=1.28$, $p<.208$ and $t(20)=1.67$, $p<.111$.

No differences were found for proportion of subjects endorsing a history of self-induced vomiting, $X^2(1)=0.00$, $p<1.000$, laxative use, $X^2(1)=0.44$, $p<.507$, or diet pill use, $X^2(1)=0.02$, $p<.894$. All DF subjects (100%) reported a preference for reducing calories as a favored dieting method compared to significantly fewer of the BF group (78.9%), $X^2(1)=4.25$, $p<.039$. There were no significant differences between the two groups in any other method of dieting such as avoiding certain foods, being on a diet, skipping meals, fasting, restricting carbohydrates, sweets, reducing portions, fad diets, and restricting fats (see Table 3).

There was a non-significant trend indicating higher self-reported rates of history of heavy alcohol use for the BF group (45.0%) compared to the DF group (21.1%), $X^2(1)=2.51$, $p<.113$. Reports of stealing were higher for the DF group (53%) compared to the BF group (45%), although not statistically significant $X^2(1)=0.23$, $p<.634$. Age of onset of first heavy alcohol use or first time stealing were not significantly different, $t(9)=0.91$, $p<.385$ and $t(17)=-0.76$, $p<.456$ respectively.

Depressive Symptomology:

The mean Beck Depression Index score of the BF group (18.06 ± 8.5) was higher than that of the DF group (13.45 ± 7.7), although the difference was not statistically significant, $t(35)=1.73$, $p<.092$. The mean Hamilton Depression Score (HDRS) score of the BF group

(12.53±5.9) was also non-significantly higher than that of the DF group (10.50±8.6), $t(37)=0.86$, $p<.398$.

Response to Treatment:

According to Table 4, frequency of bulimic behaviors were not significantly different between groups at the end of CBT treatment. However, at six month follow-up, the BF group reported significantly more improvement in treatment outcome: the BF group reported spending less time binge eating each week (1.3±1.7) hours, as opposed to the DF group (5.3±5.9) hours, $t(34)=-0.09$, $p<.045$. The BF group reported a trend toward fewer binge eating episodes (1.5±1.8) and fewer vomiting episodes (0.8±1.2) each week than the DF group (4.3±4.1 and 4.3±4.5), $t(1,17)=4.3$, $p<.053$ and $t(1,17)=3.9$, $p<.066$.

Table 1. Demographic and weight variables for group comparisons.

	Binged First <i>n</i> =20	Dieted First <i>n</i> =20	χ^2	<i>df</i>	<i>p</i>
% Caucasian	95.0	100.0	1.03	1	.311
% Never Married	75.0	65.0	3.43	3	.330
% College	70.0	84.2	4.36	5	.499
	Binge 1st <i>n</i> =20	Diet 1st <i>n</i> =20	<i>t</i>	<i>df</i>	<i>p</i>
Mean age (yrs)	27.65 ± 6.4	24.60 ± 5.8	1.58	38	.123
BMI (kg/m ²)	22.96 ± 2.5	20.06 ± 2.0	4.03	37	.001*

* $p \leq .001$ Statistical Analysis:

Categorical variables were analyzed using chi-square. Rank-ordered variables were analyzed using Kruskal-Wallis one-way analysis of variance. Likert scale and continuous variables were analyzed with t-tests. Response to treatment was analyzed using analysis of covariance using baseline measures for each variable as the covariate. Level of significance was determined using $p \leq .05$.

Table 2. EDQ

	Binged First <i>n</i> =20	Dieted First <i>n</i> =20	<i>t</i>	<i>df</i>	<i>p</i>
EDQ:					
Reported Weight (#)	136.75±14.3	111.50±10.2	6.20	36	≤.001*
Desired Weight (#)	123.00±10.1	103.94±8.5	6.25	36	≤.001*
# Meals/day	1.85±1.0	1.30±1.0	1.68	38	.101
# Snacks/day	3.44±2.2	2.16±1.4	2.10	35	.043*
Perceived current weight (1=extremely thin to 5=extremely overweight)	3.85±0.7	3.30±0.7	2.48	38	.018*
Body proportion dissatis- faction (1=extremely dissatisfied to 5=not at all dissatisfied)	2.70±1.0	3.16±0.7	-0.60	38	.551
Fear being fat (1=extremely to 5=not at all)	1.55±0.9	1.60±0.8	-0.19	38	.854
Perceived childhood weight (1=extremely thin to 5=extremely overweight)	3.40±1.0	3.15±0.7	0.90	38	.374
Teased about weight as child (1=extremely to 5=not at all)	3.79±1.4	4.16±1.1	-0.93	36	.359
Feelings re: 2 lbs. wt gain (1=strongly positive to 5=strongly negative)	6.10±0.9	6.15±0.8	-0.18	38	.856
Feelings re: 2 lbs. wt loss (1=strongly positive to 5=strongly negative)	2.50±1.3	2.15±0.9	1.01	38	.318
Uncomfortable with binge eating behavior (1=extremely uncomfortable- 5=not at all uncomfortable)	1.55±1.0	1.75±1.1	-0.61	38	.545
Age first dieting episode	17.70±3.9	14.90±2.1	2.92	29	.007
Age first binge episode	13.50±4.3	17.80±3.2	-3.54	38	≤.001*
Age first vomiting episode	18.80±3.5	17.00±5.2	1.28	38	.208
Age first laxative use	24.50±7.3	19.40±3.7	2.32	24	.029*

Age first diet pill use	17.66±4.5	15.20±1.2	1.67	20	.111
Age first alcohol use	19.50±5.4	16.80±4.1	0.91	9	.385
Age first stole	13.22±2.3	14.00±2.2	-0.76	17	.456

Table 3. Proportion of subjects endorsing EDQ items...

	Binged First N=20	Dieted First N=20	X ²	df	p
EDQ:					
Teased as child about wt.	50.0	65.0	1.64	2	.440
Occupation req. wt	-----	10.0	2.10	1	.147
Feelings about self regard- ing weight loss	84.2	75.0	0.51	1	.476
Avoid certain foods	85.0	85.0	0.00	1	1.000
Been on a diet	95.0	100.0	1.02	1	.311
Skip meals	63.2	83.3	1.91	1	.167
Completely Fast	21.1	38.9	1.41	1	.235
Restrict carbohydrates	26.3	38.9	0.67	1	.414
Restrict sweets	73.7	83.3	0.51	1	.476
Reduce portions	78.9	61.1	1.41	1	.235
Fad diets	21.1	11.1	0.67	1	.412
Reduce calories	78.9	100.0	4.25	1	.039*
Restrict fats	57.9	77.8	1.67	1	.197
<hr/>					
%Ever binged & vomited	100.00	100.00	-----	-----	-----
%Ever used laxatives	60.0	70.0	0.44	1	.507
%Ever used diet pills	60.0	57.9	0.02	1	.894
%Ever heavy alcohol use	45.0	21.1	2.51	1	.113
%Ever alcohol problems	31.6	29.4	0.02	1	.888
%Suicide attempt	16.7	16.7	0.00	1	1.000
%Self-injurious behavior	23.5	22.2	0.01	1	.927
%Ever stole	45.0	52.6	0.23	1	.634

Consume large amt. food during binge (1=never, 5=always)	4.40±0.8	4.42±0.7	-0.09	37	0.92
Eat Rapidly (1=never, 5= always)	4.55±0.7	3.95±0.8	2.62	38	0.013*
Out of Control (see above)	4.40±0.8	4.00±0.9	1.51	38	0.14
Feel Miserable after (above)	4.75±0.4	4.40±0.8	1.68	29	0.10
Uncontrollable urge (above)	4.0±0.8	3.95±1.1	.16	34	0.87
Binge Private (above)	4.45±0.6	4.35±0.7	.50	38	0.62

Table 4. Comparisons of bulimic behaviors per week at baseline, end of treatment⁺, and six month follow-up⁺.

	Binged First	Dieted First	<i>t</i>	<i>df</i>	<i>p</i>
Baseline					
Time binge eating	13.7±8.9	13.9±7.7	- 0.09	34	.932
Binge eating episodes	9.5±5.2	9.4±6.7	0.05	35	.957
Vomiting episodes	9.3±7.9	11.9±9.0	- 0.93	35	.357
Laxative episodes	1.6±4.4	1.0±2.2	0.50	35	.617
Days abstinent	1.1±1.3	1.5±1.7	- 0.74	35	.462
	Binged First	Dieted First	<i>F</i>	<i>df</i>	<i>p</i>
End of Treatment					
Time binge eating	2.6±4.5	4.5±7.4	1.54	1, 26	.225
Binge eating episodes	2.6±4.0	4.4±7.6	2.80	1, 27	.106
Vomiting episodes	1.9±3.8	6.3±11.9	1.51	1, 27	.229
Laxative episodes	0.3±1.1	0.2±0.5	0.00	1, 27	.989
Days abstinent	5.4±2.2	4.6±3.0	1.55	1, 27	.224
6 mo. Follow-up					
Time binge eating	1.3±1.7	5.3±5.9	4.73	1, 16	.045*
Binge eating episodes	1.5±1.8	4.3±4.1	4.33	1, 17	.053*
Vomiting episodes	0.8±1.2	4.3±4.5	3.87	1, 17	.066
Laxative episodes	0.1±0.2	1.2±0.3	1.17	1, 17	.294
Days abstinent	4.9±2.4	4.1±2.7	1.30	1, 17	.271

* $p < .05$

+ Analysis of covariance performed at end of treatment and six month follow-up using baseline ratings for each item as the covariate.

Discussion

The prevailing theories concerning BN suggest that severe caloric restriction precedes the onset of binge eating and subsequent purging behaviors (Davis et al., 1988; Polivy, & Herman, 1985; Wilson, 1993). This study supports previous research in that the majority of individuals with BN diet prior to binge eating. However, not all individuals with BN diet prior to the development of binge eating. Our findings indicate 8.8% of the sample of individuals with BN began binge eating behaviors before dieting, and the BF group shows more similarity to individuals with BED than the DF group. There are several clinical differences between the BF and DF groups concerning the higher BMI scores and earlier onset of binge eating of the BF group. The most distinctive difference between the BF and DF groups concern their different responses to treatment outcomes.

According to previous research, a proportion of individuals (56%) with BED report beginning binge eating behaviors before dieting (Borman-Spurrell, E., Wilfley, D., Tanofsky, M., Ryan, A., Brownell, K., 1994; Mussell, et al., in press; Wilson, 1993). Their dieting may be induced as a method to reduce the effects of their binge eating behaviors (Mussell et al., in press; Spitzer et al., 1993) rather than weight/shape concerns. If individuals participate in binge eating behavior without using purging or dieting to control weight gain, they will subsequently gain large amounts of weight. Another distinction of the BED group is the early age at which their binge eating behaviors begin. The severity of their binge eating problems was related to the age at which they began the behavior, typically around 13 to 14 years of age (Borman-Spurrell et al., 1994; Marcus, M.D., Wing, R.R., & Lamparski, D.M., 1985; Raymond et al., in press). In our present BN study similar

findings were discovered, i.e., the age of onset of binge eating behavior was 13.50 years of age in the BF group as opposed to 17.8 years of age in the diet first group.

Similar results have been reported in body mass indexes (BMI). BMI values of individuals with BED have been found to be significantly higher than those of control groups, this is due to the weight gains associated with binge eating (Spitzer et al., 1993). The binge first group in our study had significantly higher BMI values than the diet first group. In addition, it has been reported that individuals afflicted with bulimia who do not engage in treatment have a lower desired weight than those who do seek treatment (Coker, S., Vize, C., Wade, T., Cooper, P.J., 1993). The diet first group from our study had significantly lower desired weights than the binge first group. The diet first group also advocated reducing calories as a means of weight control at a significantly higher rate than the binge first group.

Subjects suffering from BED also show elevated levels of depression and high rates of past substance abuse (Marcus et al., 1988; Spitzer et al., 1993; Wilson et al., 1993). While the results of our study were not significant, they did indicate a trend toward higher rates of depression in the BF group as measured by the BDI. There were also higher rates of past alcohol abuse for the binge first group. This study also eliminated individuals who had current substance problems. Thus, it is possible that subjects who would have met criteria for the BF and DF groups may have been eliminated. The results may have also reached significance with a larger sample size.

There are obviously significant differences between the binge first and diet first group. One way in which the groups differed is in treatment outcome. All of the subjects had engaged in some form of group cognitive behavioral therapy (CBT). CBT treatment is known to be the most successful method of reducing purging behaviors (Agras, S.W., Schneider, J.A., Arnow, B., Raeburn, S.D., Telch, C.F., 1989). The treatment attempts to

stabilize and regulate eating patterns (Fairburn & Cooper, 1982). The frequency of individuals engaging in bulimic behaviors was comparable between groups at the end of treatment. However, the BF group showed significantly more improvement than the DF group in time spent binge eating, episodes of binge eating and episodes of vomiting at the six month follow-up. CBT for BN is designed along the premise that subjects with BN restrict their dietary intake (Wilson, 1993), but the subjects of this study were exposed to a program that emphasized abstaining from binge eating behaviors. The similarities between the BED group and the BF group may indicate that the BF group is more inclined to binge than to purge or diet. Therefore the BF group may have responded better to treatment because it was geared more toward stopping binge eating.

For the BF group, binge eating may have started in several ways. One suggestion is that binge eating makes dieting more necessary, the diet fails, thus perpetuating low self-esteem and creating a cycle of bulimic behaviors (Striegel-Moore, R. H., 1993). Other ideas indicate that binge eating is an emotional problem, individuals eat to escape stress or unpleasant thoughts. Steinberg indicates that bulimic behaviors can regulate mood in some patients, thus binge eating and purging can have different functions for different patients (Steinberg, Tobin, & Johnson, 1990). Thus individuals with BN who binge eat before dieting may be responding to affective or mood disorders, that are different than those who diet first. Thus binge eating is not occurring in response to food restrictions (Polivy, J., & Herman, C.P., 1993). Once this cycle is triggered the individual is influenced by fattening snack foods or alcohol as binge eating triggers (Striegel-Moore, R. H., 1993).

Another possibility is shown in Coker's study on patients who are bulimic and respond to treatment as opposed to those who do not. Those individuals who desired lower weights resisted treatment (Coker et al., 1993). In our study the binge first group desired a more reasonable, normal weight than the diet first group. Therefore, they may have

responded better to treatment because they were more willing to stop their previous eating patterns. This may be due to their problems stemming from more compulsive over-eating behavior than eating disorder cognitions. Therefore the binge first group, in a manner similar to the BED group, may exhibit less psychopathology that would inhibit treatment than the diet first group.

There are several limitations to this study that need to be addressed. One in particular is the small sample size. There were variables such as history of heavy alcohol consumption and the BDI scores which may have reached statistical significance with a larger sample size. In addition, on the EDQ form the subjects were not specifically asked if they began binge eating or dieting first. Instead, they responded to the question of what age they began such behaviors. Therefore, data was lost for subjects who responded the same year for both questions. Some of these subjects may have qualified for the binge first sample which would have expanded the sample size. The subjects were also using self-report which is difficult to validate, particularly because individuals with this disorder are at times untruthful, attempting to minimize their disorder in order to maintain it (Mitchell, 1993). The subjects were also combined from two different studies with different DSM criteria that were deemed appropriately similar. Another difference between the studies is that different treatment conditions were used, which could affect the treatment outcome data. However, the subjects used to determine treatment outcome were all given cognitive behavioral therapy.

These findings suggest that there may be more subgroups in BN categories than previously thought. If there is a treatment responsive subgroup among normal weight bulimics that resemble BED individuals it could affect the development of their treatment programs. Treatment approaches that are developed for patients with BN which incorporate an understanding of BN as caused by dieting may need to be modified in order

to be relevant to the experiences of many BF patients (Abbot et. al, in submission). Future research should further investigate this link with larger sample sizes. Researchers should be aware that dietary restriction may not always precipitate bulimic behaviors. There may be more underlying developmental and compulsivity issues that have not been investigated.

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