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Bulimia Nervosa is a serious and often debilitating mental disorder conceptualized as an endpoint along the spectrum of eating disorders, which ranges from normal eating and no preoccupation with weight to clinical eating disorders. Presently, little is known about what factors distinguish individuals who engage in behaviors in varying degrees of severity along the spectrum although there are indications that personality may be one distinguishing characteristic. This study explored the relationship between the Costa and McCrae's (1985; 1992) Five Factor Model of personality and the spectrum of bulimic behaviors and attitudes as measured by the Bulimia Test-Revised (Thelen, Farmer, Wonderlich & Smith, 1991) and the Eating Disorder Inventory-Third Edition (Garner, 2004) in 237 college females.

Hierarchical regressions and partial correlations indicated that neuroticism was the only Five Factor Model domain uniquely associated with bulimic symptomology. Facets of impulsiveness, depression, and excitement-seeking were also associated with bulimic symptomology. Anxiety, a facet of Neuroticism, was not significantly associated with bulimic symptomology. An exploratory factor analysis revealed that bulimic symptomology forms its own factor and is not subsumed in Five Factor Model space, although facet impulsiveness and depression loaded onto the bulimic symptomology factor.

These results suggest that individuals who possess personality traits of impulsiveness, excitement-seeking and depression are more likely to report bulimic

symptomology. Prevention and treatment efforts may be modified based on these personality traits. Additional research is needed to determine the etiological role these personality factors may play in the development of bulimia. Additionally, the results of this study support facet versus factor or domain level analysis of the Five Factor Model.

THE SPECTRUM OF BULIMIC BEHAVIORS AND ATTITUDES AND THE
FIVE FACTOR MODEL OF PERSONALITY

by

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APPROVAL PAGE

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CHAPTER I

INTRODUCTION

Eating disorders are among the most severe mental illnesses that affect women, with Bulimia Nervosa (BN) and Anorexia Nervosa (AN) being the two most widely recognized eating disorders. Because it is widely believed that there are different etiological pathways to BN and AN (e.g. Vervaet, van Heeringen, & Audenaert, 2004; Vitousek & Manke, 1994), this study focused exclusively on one eating disorder, namely, BN.

The Spectrum Theory of Eating Disorders

In recent years, researchers have begun to acknowledge that eating disturbances are limited not only to those described in the Diagnostic and Statistical Manual-Fourth Edition – Text Revision (DSM-IV-TR, 2000). Recognizing the wide range of eating behaviors and attitudes, researchers have proposed that eating disorders, such as BN, are the end point of a spectrum or continuum of eating behaviors and attitudes (e.g. Bennett & Cooper, 2001; Mintz & Betz, 1988; Patton, 1988; Shisslak, Crago, & Estes, 1995). Recent research using taxometric analysis has indicated that BN and AN are on separate spectrums (Williamson, Gleaves, & Stewart, 2005). Williamson and colleagues (2005) stated that based on taxometric analysis of studies examining the spectrum of eating disorders, BN and AN are on separate dimensions and are categorically different. Specifically, they hypothesized that BN and AN may have different genetic

underpinnings (Williamson et al., 2005). The spectrum or continuum theory of BN describes a dimension that ranges from normal eating and no preoccupation with weight or body shape to BN (Mintz & Betz, 1988; Williamson et al., 2005). The premise of the theory is that BN is the extreme end of a continuum along which subclinical levels of eating disturbances differ quantitatively (Franko & Omori, 1999). While the idea of a spectrum is supported by the available literature, it is also difficult to ignore the qualitative differences between individuals with a diagnosable eating disorder and those with subclinical levels of behaviors associated with eating disorders. For example, the deliberate induction of vomiting for the purpose of losing weight is a discrete act that typically does not occur in those without eating disorders. However, while there are different types of compensatory behaviors, the function of all of these behaviors is the same: to eliminate calories. It is the function of these behaviors rather than their topography that is important in the spectrum of eating disorders.

Researchers view the spectrum as ranging from normal eating, to various degrees of disordered eating behaviors and attitudes with BN being the end point (e.g., Bennett & Cooper, 2001; Laessle, Tuschl, Waadt, & Pirke, 1989; Streigel-Moore, Silberstein, & Rodin, 1986). The behavioral and attitude precursors along the continuum that have been put forward in the current literature primarily include dieting and a preoccupation with weight and body shape (Klein & Walsh, 2003; Shisslak et al., 1995). Some researchers have also included subthreshold levels of behaviors other than dieting on the spectrum, such as bingeing and compensatory behaviors (Fitzgibbon, Sanchez-Johnsen, & Martinovich, 2003; Franko & Omori, 1999; Mintz & Betz, 1988; Williamson et al.,

2005). This study focused exclusively on the continuum of eating disorders with BN as an endpoint.

One point that is widely agreed upon among proponents of the spectrum theory of eating disorders is that individuals can move along the spectrum from nondisordered eating behaviors and attitudes to disordered eating patterns and in extreme cases to a diagnosable eating disorder (Patton, 1988; Polivy & Herman, 1987; Shisslak et al., 1995; Striegel-Moore et al., 1986). There is a progression towards an eating disorder rather than the sudden occurrence of a disorder without any behavioral and attitude precursors.

There are several reasons why it is important to examine the spectrum of eating disorders as opposed to only diagnostic categories. First, looking at the entire spectrum of eating behaviors and attitudes may yield a fuller understanding of the etiology and natural development of eating disorders. Second, we may be better able to identify important etiological factors that can be obscured by the psychological and physiological changes that can occur with eating disorders (Patton, 1988). Examining differences in certain characteristics of individuals who engage in behaviors in varying degrees along the spectrum will provide a good descriptive differentiation between different points and behaviors along the spectrum. Possible modifications for empirically validated treatments for BN may also result from examining factors that vary along the spectrum. Finally, examining the spectrum of eating disorders may inform and improve prevention efforts.

Bulimia Nervosa

The DSM-IV-TR (2000) categorizes eating disorders according to behavioral and cognitive characteristics (Vervaet, Andenaert, & Van Heeringen, 2003). Bulimia Nervosa (BN), as defined by DSM-IV-TR (2000), has several essential behavioral features. Recurrent episodes of binge eating must be present with the person eating a larger amount than most people would in a short period of time accompanied by a sense of loss of control over eating during the episode. Individuals with BN must also engage in repeated inappropriate compensatory behavior that is aimed at preventing weight gain. These compensatory behaviors include self-induced vomiting, laxative abuse, diuretics, enemas, fasting and excessive exercise. Both binge eating and inappropriate compensatory behaviors must occur on average twice a week or more for at least three months. Cognitively, the self-evaluation of those with BN is overly influenced by body shape and weight.

DSM-IV-TR (2000) specifies two subtypes of BN. The Purging Type involves the behaviors of self-induced vomiting, abuse of laxatives, diuretics or enemas during the current episode of BN. The Nonpurging Type of BN is characterized by use of other inappropriate compensatory behaviors including fasting or excessive exercise, but no regular use of the behaviors in found in the Purging Type (DSM-IV-TR, 2000). The overwhelming majority of research on BN has focused on the Purging Type or has not differentiated among the subtypes (Klein & Walsh, 2003).

There is evidence to suggest that BN is on the rise (Beumont, 2002; Fairburn & Harrison, 2003; Hoek, 1993; Hoek & Van Hoeken, 2003). A review of the literature

reveals that prevalence estimates vary widely. The DSM-IV-TR (2000) states that the lifetime prevalence rate among women for BN is roughly 1-3%. Fewer males develop BN with a lifetime prevalence rate of approximately 0.1-0.3% (DSM-IV-TR, 2000). Because BN is so rare in men, only females were included in this study.

In the past, BN has been more prevalent in higher socioeconomic classes. However, today it appears to be more equally distributed across all socioeconomic classes (Quadflieg & Fitcher, 2003). It has been hypothesized that this equalization is due to the increasing permeation of the image of an ideally thin physique in our culture across classes (Polivy & Herman, 2002). BN has been, and still is, more prevalent in industrialized, developed societies that value thinness (Hoek, 2002).

Why Examine Personality?

Personality traits have been implicated in the development of eating disorders in many etiological models of BN (e.g., Fairburn & Harrison, 2003; Johnson & Wonderlich, 1992). While personality traits are often correlated with eating disorders, it must be noted that these associations do not imply that personality traits cause the development of eating disorders. Rather they provide a starting point for examining the development of eating disorders.

Personality is more stable than other factors associated with BN. On the one hand, most studies focus on psychological variables such as depression, anxiety, and dysfunctional weight-related thoughts that can be influenced by eating disorder symptoms. This makes determining the nature of the relationship between these variables and progression along the spectrum difficult. Personality, on the other hand, is

considered to be fairly stable throughout adulthood (Costa, McCrae, & Siegler, 1999). Longitudinal analyses indicate significant stability of personality traits across the adult lifespan (McAdams, 2001). There is even some evidence that suggests personality traits from childhood may persist throughout adulthood. For example, Anderluh and colleagues (2003) found a significant relationship between retrospectively reported childhood obsessive and compulsive personality traits and adult obsessive-compulsive personality disorder (OCPD) traits. The likelihood of having OCPD as an adult increased as the number of childhood obsessive and compulsive traits increased (Anderluh et al., 2003).

Certain personality traits are believed to be highly stable within individuals (Kleifield, Sunday, Hurt, & Halmi, 1994). Research is emerging that indicates stable personality traits are a large factor in the development of eating disorders (Vervaet et al., 2003). Many of the personality traits that are related to eating disorders remain after recovery, which suggests that they are persistent, constant traits (Anderluh et al., 2003; Bloks, Hoek, Callewaert, & van Furth, 2004). For example, individuals with BN frequently report a high level of trait narcissism that continues after recovery from BN (Wonderlich, 2002). Individuals who have recovered from eating disorders still report higher harm avoidance and persistence than control subjects, which implies that these temperament variables may make individuals more vulnerable to developing an eating disorder (Bloks et al., 2004). Personality traits may also predict the long-term course of eating disorders (Halmi, Kleifield, Braun, & Sunday, 1999) and are more precise

predictors of outcome compared to other variables such as Axis I pathology, socioeconomic status, and family psychopathology (Quadflieg & Fitcher, 2003).

BN can be comorbid with certain personality disorders, particularly Borderline Personality Disorder and other Cluster B disorders (Beumont, 2002; Claes, Vandereycken, & Vertommen, 2002). Individuals who have BN and a personality disorder often have poorer outcomes than those with an eating disorder alone, which highlights the important influences of personality (Wonderlich, 2002). Increased depressive symptoms and poorer overall functioning are also found in individuals with BN and a personality disorder (Bulik, Sullivan, Joyce, & Carter, 1995).

Very little is known about what factors have an effect on the move from less serious weight control behaviors to serious, debilitating patterns of eating behavior (Patton, 1992). The contribution of personality to the development of eating disorders and progression along the spectrum has largely been overlooked (Bennett & Cooper, 2001). It is possible and highly likely that personality traits may interact with other factors to produce movement along the spectrum.

Personality and Bulimia Nervosa

While personality traits have rarely been studied in the context of the spectrum of eating disorders, personality is nearly always considered a factor in etiological models of the development of BN (e.g. Johnson & Wonderlich, 1992; Schmidt, 2002). The relationship between several personality traits and diagnosed BN has been explored.

Impulsivity. High levels of impulsivity are found in individuals with BN (Wonderlich, 2002). Individuals with BN and AN-Binge Eating/Purging Type have

reported higher levels of impulsivity than those with AN-Restricting Type and controls (Claes et al., 2002; Diaz-Marsa et al., 2000; Vervaet et al., 2003), which suggests that impulsivity is directly related to binge eating and purging behaviors. Fischer, Smith, and Anderson (2003) noted that there are multiple types of impulsivity and found that individuals with BN are high in urgency impulsivity, which is a tendency to act rashly in the face of negative emotions.

It has been proposed that the cycle of restraint and disinhibition seen in BN reflect a fundamental characteristic of impulsivity, which can lead directly to bingeing and purging (Vitousek & Manke, 1994). Klein and Walsh (2003) speculated that the higher rates of substance abuse found in individuals with BN might reflect an overall tendency towards impulsivity as well as other and self-related aggression. The high level of impulsivity in individuals with BN is also associated with recurrent self-harm, sexual disinhibition, and shoplifting (Cooper, 2003). Additionally, individuals with BN report lower levels on the Control scale of the Multidimensional Personality Questionnaire than individuals with AN. This lower score suggests that people with BN are not cautious, do not think prior to action, can be irrational and prefer unplanned activities, all of which characterize impulsivity (Pryor & Wiederman, 1996).

Need for social approval. A review of the literature suggests that BN is related to approval seeking (Johnson & Wonderlich, 1992). Individuals with BN have indicated a higher need for social approval than dieters and controls (Schenker, 1998). The need for social approval has been found to predict eating disturbances in a population of Japanese women (Mukai, Kambara, & Sasaki, 1998). Belangee, Sherman, and Kern (2003)

examined lifestyle personality attributes and found that the need to please and have the approval of others was positively correlated with perfectionism and drive for thinness on the Eating Disorder Inventory. While women with BN desire social approval, they often report lack of social self-confidence (Rogers & Petrie, 2001).

Interpersonal style. Low frustration tolerance, ineffectiveness, and interpersonal sensitivity have been included in an etiological model of BN as personality factors that can lead to the pursuit of thinness and eventually BN (Johnson & Wonderlich, 1992). There is evidence to suggest that individuals with BN are interpersonally sensitive (Wonderlich, 2002), particularly to rejection (Johnson & Wonderlich, 1992). They also report more empathy towards others (Bennett & Cooper, 2001). However, interpersonal distrust, defined as an overall feeling of alienation coupled with a hesitancy to form close relationships (Bennett & Cooper, 2001), as well a general sense of ineffectiveness predispose an individual to developing BN and are believed to be heritable (Lilenfeld et al., 2000). In one study, individuals with BN reported higher levels of interpersonal distrust and ineffectiveness than dieters and controls (Laessle et al., 1989). Retrospective reports of shyness during childhood are also more common in individuals who later develop BN than controls (Fairburn, Welch, Doll, Davies, & O'Connor, 1997). Furthermore, individuals with BN reported being less sociable and interpersonally warm (Pryor & Wiederman, 1996), reported more interpersonal problems (Casper, Hedecker, & McClough, 1992), and indicated more conformity than controls (Bennett & Cooper, 2001). As can be seen above, there are clearly inconsistencies in the published literature there regarding the interpersonal style that is associated with having or developing BN.

Perfectionism. Perfectionism has been examined across the spectrum of eating disturbances. Individuals with BN reported the highest amount of perfectionism, followed by intensive dieters (dieting and binge eating but no compensatory behaviors), casual dieters (dieting only), and non-dieters (Franko & Omori, 1999). Retrospective reports of high perfectionism during childhood are associated with BN (Anderluh et al., 2003; Fairburn et al., 1997). Moreover, research has shown that individuals with BN report having the perception that others are trying to place expectations of perfection onto them, and they then try to live up to those expectations (Hewitt & Flett, 1991; Hewitt, Flett, & Ediger, 1995). Perfection increases an individual's risk for developing BN (Fairburn, Cooper, & Shafran, 2003) and is thought to be heritable (Lilenfeld et al., 2000).

Obsessionality. Obsessionality is associated with BN (Patton, 1992; Rogers & Petrie, 2001). In one study, individuals with BN reported that they thought about weight significantly more often than individuals who just purged, met DSM qualification for Eating Disorder-Not Otherwise Specified, chronic dieters, bingers, and controls (Mintz & Betz, 1988). Claes and associates (2002) found that individuals with BN reported a high quantity of obsessive thoughts, particularly about losing control over their behavior which is likely related to impulsivity. Anderluh and colleagues (2003) found that people with BN reported considerably more obsessive traits than controls. They noted that each additional obsessive or compulsive childhood trait increased the odds of developing an eating disorder nearly seven-fold (Anderluh et al., 2003).

Novelty seeking. Novelty seeking, one of Cloninger's (1987) proposed personality traits, has been examined in individuals with BN. People with BN generally score significantly higher on novelty seeking than those with AN-Restricting Type and controls (Bulik, Sullivan, Weltsin, & Kaye, 1995; Kleifield et al., 1994; Vervaet et al., 2003). This indicates that people with BN have a tendency towards excitability, impulsivity, extravagance, disorderliness, and curiosity (Kleifield et al., 1994). The trend towards individuals with BN being high on novelty seeking has been found to persist before, during, and after treatment for BN (Bloks et al., 2004).

Harm avoidance. Harm avoidance, another of the biologically based personality factors proposed by Cloninger (1987), is an indicator of an individual's tendency to respond to stressful situations with behavioral inhibition, fear, anxiety and depression (Fassino et al., 2002). Individuals high in harm avoidance often worry, are pessimistic, fear ambiguity, and are shy with strangers (Kleifield et al., 1994). A high degree of harm avoidance is common in those with eating disorders and distinguishes them from controls (Fassino et al., 2002; Kleifield et al., 1994). Diaz-Marsa and associates (2000) found that individuals with BN indicated higher harm avoidance than those with AN and controls. Individuals who have recovered from BN still report higher harm avoidance than controls, suggesting that it may be a risk factor for developing BN (Bloks et al., 2004).

Reward dependence. Another of Cloninger's (1987) components of personality is reward dependence. Individuals with BN have reported significantly lower levels of reward dependence than those with AN and controls. Low reward dependence is characterized by a less intense response to rewards as well as insensitivity, detachment,

being practical and tough-minded (Kleifield et al., 1994). Many other studies have found no differences between BN and AN and/or controls on reward dependence (e.g., Bulik et al., 1995, Fassino et al., 2002).

While the afore mentioned research sheds light on singular personality traits that are associated with BN, it does not present a comprehensive picture of the personality profile associated with bulimic symptomology. First, these studies take a categorical approach to BN rather than the dimensional approach that is suggested by the spectrum theory of eating disorder. Furthermore, nearly all of the studies cited above took a piecemeal approach to examining personality by only looking at one particular trait. Since some personality traits are correlated with one another (McAdams, 2001), the piecemeal approach is weak because it does not account for the interrelationships of traits, which may lead to flawed conclusions about the importance of a particular trait. A more comprehensive approach to personality trait assessment is needed to explore the relationship between personality and bulimic symptomology.

The Five Factor Model of Personality

Although there are other five factor models of personality, this study chose to focus exclusively on Costa and McCrae's (1992) five factor model of personality. Therefore, any references to the Five Factor Model refer to Costa and McCrae's (1992) model. The Five Factor Model (FFM) of Personality, based on the compilation of 40 years of factor analytic studies, began to emerge as researchers started to agree that personality traits could be grouped into five basic categories (Costa et al., 1999; McAdams, 2001). The FFM states that there are five universal personality traits that are

present in varying degrees in each individual. These five primary traits are Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness (McCrae & Costa, 1987).

Since it was originally introduced, a large body of research has been created that supports the FFM of personality (Costa et al., 1999; McAdams, 2001; McCrae & Costa, 1987). The FFM is the first comprehensive account of traits in the history of personality psychology (McAdams, 2001) and is considered by many psychologists to be the best depiction of trait configuration (Podar et al., 1999). The model is considered to be efficient as it provides a global description of personality in as little as five scores. Furthermore, support for the FFM has been found across cultures (McCrae, Costa, Martin, Oryol, Rukavishnikov, Senin, et al., 2004; McCrae & John, 1992).

In contrast to theories of personalities, such as Cloninger's (1987) or Staats' (1996) personality theories, the FFM is a descriptive model that only depicts the degree to which a person possesses the five basic personality traits and their facets. The model does not explain the origins of personality (Costa et al., 1999). However, McCrae and John (1992) noted that present theories of personality are not completely adequate in explaining the origins and operation of all the five factors.

There are five primary traits that are identified in the FFM, each of which has six facets that comprise the trait. Supporters of the FFM note that these five factors can be found in virtually all personality measures and across cultures (McCrae & John, 1992). The first and least debated trait is Neuroticism (McAdams, 2001). Neuroticism represents a spectrum ranging from emotional stability to emotional instability. An

individual that is high in neuroticism will have a tendency towards worrying, feeling insecure, having low self-esteem, being self-conscious, and being temperamental. Negative affect and disturbed thoughts or behaviors that result from emotional distress are also elements of neuroticism (McCrae & Costa, 1987). Low neuroticism is associated with being calm, relaxed, and typically unemotional as well as having good self-esteem (McAdams, 2001).

The six facets of neuroticism are Anxiety, Angry Hostility, Depression, Self-Consciousness, Impulsiveness, and Vulnerability. Individuals high in the facet of Anxiety are apprehensive, fearful, nervous, tense, and tend to worry while those low in anxiety are calm and relaxed. Angry Hostility assesses an individual's tendency towards experiencing anger. High scorers are more likely to experience anger while low scorers are easygoing and slow to anger. The Depression facet measures an individual's proneness towards experiencing negative affect. High scorers tend to experience guilt, sadness, hopelessness, and loneliness, whereas low scorers rarely have these emotions. Individuals high in Self-Consciousness feel uncomfortable or inferior around others and are sensitive to criticism while those low in Self-Consciousness are not as disturbed by uncomfortable social situations. The Impulsiveness facet measures one's inability to control cravings and urges, with individuals high in Impulsiveness are less able to resist urges and low individuals more able to resist temptations. Vulnerability assesses one's vulnerability to stress with those high in this facet being more likely to feel unable to cope with stress or to respond to stressful situations with dependence, hopelessness, and

panic. Individuals low in Vulnerability believe that they can handle themselves in difficult situations (Costa & McCrae, 1992)

Extraversion is associated with reports of feeling good about life. Individuals high in Extraversion are sociable, fun-loving, affectionate, friendly, gregarious, assertive, and have a high activity level (McCrae & Costa, 1987). Low Extraversion is related to being withdrawn, quiet, contemplative, and less likely to take risks (McAdams, 2001). McCrae and Costa's (1987) idea of extraversion corresponds to Eysenck's concept of extraversion.

Warmth, Gregariousness, Assertiveness, Activity, Excitement-Seeking and Positive Emotions are the facets of Extraversion. Warmth assesses interpersonal intimacy. Individuals high in Warmth are friendly and affectionate while those low in warmth are interpersonally formal, reserved, and distant. Gregariousness measures a person's preference towards being with others, with high scorers seeking out the company of others while low scorers do not. Individuals high in Assertiveness are dominant, forceful, and speak without hesitation while those low in Assertiveness remain in the background and let others talk. Activity gauges movement and energy. Active individuals have fast-paced lives, are energetic and stay busy; however, those low in activity are more leisurely. High scorers in Excitement-Seeking desire excitement and stimulation, whereas low scorers do not need thrills. The facet of Positive Emotions assesses the inclination towards experiencing positive emotions. Individuals high in Positive Emotions are cheerful, optimistic, and laugh often, while those low in positive emotions are less exuberant and high-spirited (Costa & McCrae, 1992).

Openness to Experience is the third personality trait in the Five Factor Model. Individuals who are high in Openness to Experience typically are original, imaginative, creative, analytic, have broad interests, are daring, usually see themselves as more intelligent and tend to be viewed by others in that manner as well. A high degree of openness to experience is also associated with welcoming change and challenges (McCrae & Costa, 1987). Individuals who are low in Openness to Experience are more conventional, rigid, and conforming. They are less creative, analytic, and artistic, and tend to have narrow interests (McAdams, 2001).

The facets of Openness to Experiences are Fantasy, Aesthetics, Feelings, Actions, Ideas, and Values. Individuals high in Fantasy have vivid imaginations, an active fantasy life, and daydreams while those low in Fantasy are more prosaic and would rather keep their attention on a given task. Aesthetics measures a person's appreciation for art and beauty. High scorers on the Aesthetics facet like and appreciate art, music, and poetry, whereas low scorers are not interested in art or beauty. The Feelings facet assesses an individual's receptivity to their own inner feelings and emotions and the valuation of emotion as a significant part of life. Individuals high in Feelings experience more deep and diverse emotional states and feel happiness and unhappiness more intensely than others. Individuals low in Feelings have blunted affects and do not value emotions. The facet of Actions examines one's willingness to try different behavioral situations. On the one hand, high scorers in Actions prefer novelty and will try new activities, foods, and places, while, on the other hand, low scorers have difficulty adjusting to change and prefer to stick with what they know. The facet of Ideas measures intellectual curiosity.

High scorers take pleasure in philosophical debates and brain-teasers while those low in ideas have limited curiosity. Finally, Values explores an individual's willingness to reexamine social, political, and religious values. High scorers are more willing to examine their values, while low scorers are more likely to accept authority and traditions and tend to be more conservative (Costa & McCrae, 1992).

Agreeableness is another trait in the FFM. Individuals high in Agreeableness are empathic, trusting, honest, friendly, cooperative, kind, understanding, courteous, selfless, and kind. Individuals low in Agreeableness are characterized by setting themselves against others, being mistrustful, skeptical, callous, manipulative, unsympathetic, uncooperative, unreliable, stubborn, and rude (McCrae & Costa, 1987).

Trust, Straightforwardness, Altruism, Compliance, Modesty and Tender-mindedness are facets of Agreeableness. Trust is the first facet of Agreeableness. Individuals high in Trust typically believe that others are honest and have good intentions, while individuals low in Trust are inclined to be cynical and skeptical of others and assume they are dishonest or threatening. With Straightforwardness, high scorers are frank, sincere, and ingenuous, while low scorers are more manipulative through flattery, craftiness and deception. On the one hand, individuals who are high in Altruism are concerned with the welfare of others and are generous, considerate, and helpful. On the other hand, individuals who are low in Altruism are self-centered and less likely to involve themselves in other people's problems. The facet of Compliance assesses how individuals react to interpersonal conflict. High scorers in Compliance defer to others, inhibit aggressive tendencies and tend to forgive and forget, whereas low

scorers are more aggressive, competitive, and are not reluctant to show aggression. Individuals high in Modesty are humble although not necessarily lacking in self-esteem, while those low in Modesty believe they are superior and are seen as conceited or arrogant by others. The last facet of Agreeableness, tender-mindedness, examines attitudes of sympathy and concern for other people. High scorers are moved by the needs of others and focus on the human side of policies, whereas low scorers are more hardheaded and not as affected by emotional appeals (Costa & McCrae, 1992).

Conscientiousness is the last trait in the Five Factor Model. Individuals high in Conscientiousness are hardworking, organized, dependable, ambitious, energetic, persevering, and purposeful. They also stick to plans, schedules, and requirements, and are predictable. Individuals low in Conscientiousness are lazy, disorganized, indecisive, spontaneous, irresponsible, and undirected (McCrae & Costa, 1987).

The facets of Conscientiousness are Competence, Order, Dutifulness, Achievement Striving, Self-discipline, and Deliberation. The facet of Competence measures the degree to which one is capable, sensible, prudent, and effective, and is associated with self-esteem. Individuals high in Competence are well-prepared to deal with life, while low scorers feel less prepared or inept. People who are high in Order are neat, tidy, and well-organized, whereas those who are low in Order are disorganized and unmethodical. Dutifulness assesses the degree to which a person is governed by their conscience. High scorers strictly adhere to ethical principles and moral obligations, while low scorers are more casual about such things and tend to be unreliable. Individuals high in Achievement Striving have high aspirations, work hard to achieve goals, and are

diligent and purposeful. However, individuals low in Achievement Striving are lackadaisical, lack ambition, and are sometimes lazy. Self-discipline examines a person's ability to begin and complete tasks, despite boredom and distractions. High scorers can motivate themselves to finish a task, whereas low scorers procrastinate and become easily discouraged. The last facet of Conscientiousness is Deliberation, which is the tendency to think before acting. Individuals high in Deliberation are cautious and deliberate, while those low in Deliberation are hasty and speak or act without considering the consequences (Costa & McCrae, 1992).

The Five Factor Model and the Spectrum of Bulimia Nervosa

Inherent in the idea that there are multiple etiological pathways and variables that contribute to the development of BN, is the belief that there is variability in factors that lie within the individual. Personality traits are an important individual factor in the development of BN. The FFM provides the most comprehensive framework for examining the different personality traits present in those engaging in certain behaviors along the spectrum of bulimic behaviors and attitudes.

Among the other strengths of the FFM mentioned above, an additional asset is that it is a dimensional approach to personality. This allows for examination of the relative strength of a personality trait rather than simply the absence or presence of a trait. Dimensional approaches do not force categorization (Bulik et al., 1995). The five factors are assessed using the NEO-PI-R. The NEO-PI-R, which is discussed in more detail in the methods section, consists of 240 items that measure the personality traits and facets of the FFM (Costa & McCrae, 1992).

The FFM is effective in combining and explaining the personality facets of various theoretical perspectives including Henry Murray's theory of needs, J. P. Guilford's theory of temperaments, C. J. Jung's functions and attitudes, and R. Cloninger's biologically based theory of temperament (Costa et al., 1999). The NEO-PI – R (Costa & McCrae, 1992) also correlates well with many other personality measures and specifically other measures of the Big Five traits (McAdams, 2001; McCrae & John, 1992). McCrae and John (1992) pointed out that when researchers haphazardly select individual personality variables to examine, insight is lost, whereas examination with the FFM will result in a more complete and systematic picture of personality. Furthermore, the FFM provides a common language for psychologists from varied backgrounds and a common framework for researchers (McCrae & John, 1992).

The FFM and NEO-PI-R are useful in a variety of situations, including clinical, educational, forensic, and health settings. The FFM is considered to be a good place to start to understand the relationship of personality and other phenomena (McCrae & John, 1992). The FFM has been used in three studies exploring eating disorders, including BN (Brookings & Wilson, 1994; Ghaderi & Scott, 2000; Podar, Hannus & Allik, 1999). These studies are discussed in detail in the next section.

Studies Using the Five Factor Model to Explore Eating Disorders

There are surprisingly few studies that have explored BN and personality within the context of the FFM (Podar et al., 1999). Based on literature searches, there appear to be only three journal articles in the published literature on BN that used the FFM to examine personality links. As discussed further below, these studies have several

limitations. They typically consider eating disorders as a group and use a categorical model of eating disorders. Also, some studies did not use the full version of the NEO-PI. Two of the three studies used European populations, which may limit generalizability to an American population.

The first published research study that examined the FFM and the spectrum of eating disorders was conducted by Brookings and Wilson (1994) in a nonclinical sample of undergraduate women. Participants completed two measures of eating disordered attitudes and behaviors, the Eating Disorder Inventory (EDI) (Garner & Olmsted, 1984) and the Eating Attitudes Test (EAT) (Garner, Olmsted, Bohr, & Garfinkel, 1982) which assess for symptoms of AN. A shorted version of the NEO-PI was used that only assessed Neuroticism, Extraversion and Openness to Experience. Analyses indicated that Neuroticism, and all six of its facets, were positively related to drive for thinness, bulimia, body dissatisfaction, ineffectiveness, and lack of interoceptive awareness on the EDI and anorexia symptomology on the EAT. The Neuroticism facet of Anxiety was positively correlated with perfectionism on the EDI. Interpersonal distrust as measured by the EDI was positively related to neuroticism facets of depression, self-consciousness, and vulnerability (Brookings & Wilson, 1994).

Brookings and Wilson (1994) also found relationships between Extraversion and eating disordered attitudes and behaviors. Extraversion facets of Warmth, Assertiveness, and Activity were positively related to drive for thinness on the EDI and anorexic symptomology on the EAT. As is logical, interpersonal distrust on the EDI was negatively related to Extraversion facets of Warmth, Gregariousness, Assertiveness, and

Positive Emotions. Ineffectiveness on the EDI was negatively correlated with Extraversion facets of Warmth and Positive Emotions. Only one significant relationship was found between Openness to Experience and disordered eating. Anorexic behaviors and attitudes, as measured by the EAT, were negatively correlated with the Action facet of Openness to Experience (Brookings & Wilson, 1994).

While providing a very basic picture of personality correlates of disordered eating behaviors and attitudes, Brookings and Wilson's (1994) study has several limitations. First, the study used a shortened version of the NEO-PI that did not allow for consideration of the traits of Agreeableness or Conscientiousness. Also, it is unclear which eating disorders were being examined in their sample. As noted previously, AN and BN are believed to be on separate spectrums of behaviors and attitudes (Williamson et al., 2005). Further interpretation of the results would have been aided by separating these continuums.

In a prospective study with over 800 Swedish participants, Ghaderi and Scott (2000) also used the FFM to explore personality correlates of individuals with a lifetime history of an eating disorder and a first-time incidence of an eating disorder. Individuals diagnosed with AN, BN, Binge Eating Disorder, and Eating Disorder Not Otherwise Specified were all included in the study. A control group of individuals without a history of an eating disorder was also used in comparisons. Individuals were assessed using DSM-IV-TR criteria, through a measure called the Survey for Eating Disorders (Gotestam & Agras, 1995), for an eating disorder and also completed an abbreviated

version of the Big-Five Markers called the Mini-Markers (Saucier, 1994) that consists of 40 personality adjective markers and is based on the Five Factor Model.

At Time One, all individuals were assessed for an eating disorder and completed the Mini-Markers. At Time Two, two years later, individuals were once again assessed for an eating disorder. Only 33 women had developed an eating disorder in the two-year period. Individuals who had not had an eating disorder at Time One, but did at the two-year follow-up had higher Neuroticism and Openness to Experience scales and lower Agreeableness scores than individuals with no history of an eating disorder. Individuals with a lifetime history of an eating disorder scored higher on the trait dimensions of Neuroticism and Openness to Experience and lower on Agreeableness and Conscientiousness than individuals with no history of an eating disorder. Ghaderi and Scott (2000) concluded that the similar pattern between those with a lifetime history of an eating disorder and those with a first time incident of an eating disorder can be regarded as a vulnerability for developing an eating disorder. A premorbid and ongoing personality pattern of high Neuroticism and Openness to Experience along with low Agreeableness may explain why some individuals develop an eating disorder and others do not (Ghaderi & Scott, 2000).

Although Ghaderi and Scott (2000) can be commended for attempting a longitudinal study, there are several limitations to their study that must be considered when examining their findings. As Ghaderi and Scott (2000) pointed out themselves, the reliability and validity of the Mini-Markers is uncertain. Furthermore, the authors did not mention how well the Mini-Markers scales are believed to be directly indicative of the

Big Five personality factors. It is possible that the Mini-Markers scales do not directly and accurately match the Big Five personality traits. Ghaderi and Scott (2000) also note the lack of examination of the sensitivity and specificity in the Survey for Eating Disorders in correctly diagnosing eating disorders. Using an instrument whose psychometric properties have not yet been fully established makes the results of the study questionable. Additionally, there may be personality differences in the various diagnostic categories that are not seen in this study because analyses grouped all the diagnostic categories together. Attrition was high in this study with 2,000 individuals originally being contacted to participate in the study while only 856 completed both stages of the study. There could have been possible personality or eating disorder differences among those who completed the study and those who did not. And finally, while there is cross-cultural support for the FFM and NEO-PI-R (e.g. McCrae & John, 1992), it is possible that the results from a Swedish population would not be representative of an American population.

In a study conducted in Estonia, Podar, Hannus, and Allik (1999) examined the NEO-PI profiles of individuals with a clinically diagnosed eating disorder (AN, BN or Eating Disorder Not Otherwise Specified), individuals in a Weight Watchers weight-reduction group, and controls. Podar and colleagues (1999) had participants complete Estonian versions of the Eating Disorder Inventory-2 (Garner, 1991), a measure of behaviors and attitudes associated with disordered eating and the Estonian version of the NEO-PI (Pulver, Allik, Pulkkinen, & Hamalainen, 1995).

As expected, both the eating disorder and Weight Watcher groups reported a significantly higher drive for thinness than the control group. However, the Weight Watchers group reported significantly more body dissatisfaction than the other two groups. There was surprisingly no difference in body dissatisfaction between those with an eating disorder and those in the control group. Individuals with an eating disorder were significantly higher in Neuroticism and significantly lower on Extraversion than the other two groups. Both the eating disorder and Weight Watchers groups had relatively low Openness to Experience scores, and the control group was significantly higher on Openness to Experience. The eating disorder group was significantly lower on Conscientiousness, followed by the Weight Watcher group, and then the control group. There were no group differences on Agreeableness, with all groups reporting scores in the average range (Podar et al., 1999).

Facet differences were also found between the groups. Individuals with an eating disorder reported significantly more Anxiety, Depression, Hostility, and Vulnerability, all facets of Neuroticism, than the Weight Watchers and control groups. Those with an eating disorder also indicated higher Self-Consciousness, another facet of Neuroticism, than the control group. Lower Gregariousness and Positive Emotion scores, both facets of Extraversion, were reported by those with an eating disorder compared to the Weight Watchers and control groups. Relatedly, disordered eating was associated with increased negative emotion and decreased positive emotional experience, or anhedonia. Surprisingly, the eating disorder group indicated significantly less Activity, an Extraversion facet, than the control group (Podar et al., 1999).

Podar and colleagues (1999) concluded that their results supported the spectrum or continuum theory of eating disorders because the Weight Watchers group frequently scored between the eating disorder and control groups. They also stated that their findings confirm the assumption that personality traits can predispose an individual to an eating disorder. They specifically affirm that high Neuroticism coupled with low Openness to Experience and Conscientiousness make an individual more vulnerable to developing an eating disorder (Podar et al., 1999).

A few factors must be considered when interpreting the findings of Podar and associates (1999). First, Podar and colleagues (1999) speculated that the Weight Watcher group is likely more representative of binge eating than dieting based on their report of binge behaviors. While binge eating may be a behavior on the spectrum of eating disorders, it is very important to know exactly which behaviors the Weight Watchers group represents because dieters and binge eaters may have different personality characteristics. For example, we may logically speculate that individuals who binge eat are more impulsive, a facet of neuroticism, than individuals who diet because bingeing is frequently associated with impulsivity (e.g., Claes et al., 2002). Furthermore, all eating disorders were grouped into one group for analysis. There may be differences in FFM profiles between those with AN and BN, for example, that would be masked in this study. Furthermore, the study was conducted in Estonia, which has a low rate of eating disorders (Podar et al., 1999). It is possible that the factors, including personality characteristics, which make an Estonian more likely to develop an eating disorder, may differ from the factors that increase an individual's risk in a society where eating disorders are more

prevalent. For example, perhaps Agreeableness would be significantly lower in individuals with eating disorders or extreme weight concern in societies that place more emphasis on weight and shape, as was the case in Ghaderi and Scott's (2000) sample of Swedish women, as the individual feels more resentment and less trust towards society with its oppressive ideal of thinness.

Statement of Purpose

The purpose of the present study was to explore personality differences in the context of the FFM of personality between individuals engaging in certain behaviors along the spectrum of bulimic behaviors and attitudes. As noted above, there are surprisingly few studies to date that have explored personality and BN using the framework of the FFM of personality. The present study explored eating along the continuum of BN by using two measures of eating behaviors and attitudes as indicated in the methods section.

Currently in the published literature, there are no studies that examine bulimic eating behavior and attitudes in a continuous manner and its relationship to the FFM of personality. The studies that have examined disordered eating and Costa and McCrae's model of personality have compared groups (e.g., those with an eating disorder versus those without an eating disorder) or have not distinguished between the different eating disorder spectrums, thus limiting some of the interpretability of the findings (Cassin & von Ranson, 2005). Only comparing groups does not fully indicate whether or not personality traits vary along the full continuum of bulimic eating behavior and attitudes.

This study aims to fill this gap in the literature by examining bulimic eating behaviors and attitudes in a continuous manner.

Additionally, other studies (Ghaderi & Scott, 2000; Podar et al., 1999) have combined all eating disorders together in analyses. This is problematic because as previously mentioned, there are significant etiological differences in BN and AN (Vitousek & Manke, 1994). The present study examined only the spectrum of bulimic behaviors and attitudes. Also, this study used the full version of the NEO-PI-R rather than a reduced version. Additionally, this study will examine the FFM factors and facets while statistically controlling for the other factors and facets in order to examine the unique contribution the factors and facets make to BN symptomology. Moreover, research on the relationship between BN and the FFM of personality has been inconsistent. This study will add to this literature and may provide clarification on this relationship.

Hypotheses

Based upon a review of the literature, the following hypotheses were developed:

- 1) There will be a positive association between Neuroticism scores and self-reported bulimic symptomology. The three previous studies (Brookings & Wilson, 1994; Ghaderi & Scott, 2000; Poddar et al., 1999) that have explored the relationship between the FFM and eating disorders have all found Neuroticism to be positively correlated with disordered eating. Moreover, numerous studies (e.g., Claes et al., 2002; Diaz-Marsa et al., 2000; Vervaet et al., 2003) have found a relationship between high impulsivity and BN, and Impulsiveness is a facet of Neuroticism.

Johnson and Connors (1987) suggested that low frustration tolerance and feelings of ineffectiveness can lead to BN. Relatedly, according to Costa and McCrae (1992), individuals high in Angry Hostility (N2) are easily frustrated and those high in Vulnerability (N6) are likely to feel that they are unable to cope with stress. Additionally, research has indicated that individuals with BN lack social self-confidence (Rogers & Petrie, 2001) which is represented by low scores on the Self-Consciousness (N4) facet as a proneness to feeling uncomfortable around and inferior to others (Costa & McCrae, 1992). Individuals with BN have been found to have high harm avoidance which indicates a tendency to respond to stressful situations with behavioral inhibition, fear, anxiety, and depression (Blocs et al., 2004; Diaz-Marsa et al., 2000). High harm avoidance may be consistent with high Anxiety (N1) and high Depression (N3).

- 2) There will be a positive association between Anxiety facet scores of Neuroticism and self-reported bulimic symptomology. Research has indicated that individuals with BN report a significant amount of state anxiety (e.g. Fairburn & Harrison, 2003). And, as noted above, high harm avoidance may be indicative of high Anxiety (N1). Given that individuals with BN report a high amount of obsessiveness (Anderluh et al., 2003; Claes et al., 2002), this may map onto the tendency to worry that is represented in the Anxiety (N1) facet (Costa & McCrae, 1992). Furthermore, Brookings and Wilson (1994) found that the Eating Disorder Inventory subscales were positively correlated with Anxiety (N1).

- 3) There will be a positive association between Impulsiveness facet scores of Neuroticism and self-reported bulimic symptomology. There are a number of studies that have demonstrated a relationship between impulsivity and BN (Claes et al., 2002; Diaz-Marsa et al., 2000; Vervaet et al., 2003; Wonderlich, 2002). In addition, several researchers have theorized that impulsivity is a key underlying personality trait in BN (Johnson & Wonderlich, 1992; Vitousek & Manke, 1994). Individuals with BN have reported low levels on the Control scale of the Multidimensional Personality Questionnaire which suggests that they are not cautious, do not think prior to action, can be irrational, and prefer unplanned activities, all of which characterize impulsivity (Pryor & Wiederman, 1996). Moreover, individuals with BN have been found to have high novelty-seeking, which includes a tendency towards impulsivity (Bloks et al., 2004; Kleifield et al., 1994).
- 4) There will be a positive association between Excitement-Seeking facet scores of Extraversion and self-reported bulimic symptomology. High novelty-seeking has been associated with BN which indicates excitability, extravagance, and curiosity (Bloks et al., 2004; Kleifield et al., 1994), all of which are likely to be associated with seeking excitement and stimulation. Additionally, the high levels of impulsivity exhibited by individuals with BN (e.g. Claes et al., 2002) may be related to seeking excitement, which has also been described by Costa and McCrae (1992) as daring, adventurous, and pleasure-seeking.

Exploratory Examination. The extent to which BN pathology maps onto the Five Factor Model was assessed. In order to determine if bulimic behaviors and attitudes fall into FFM space or comprises its own factor, a factor analysis was conducted.

CHAPTER II

METHOD

Participants

Two hundred and eighty one participants were recruited through the University of North Carolina at Greensboro Introductory Psychology course subject pool. Female undergraduate students were invited to participate and received course credit for their participation. Males were excluded from this study as females are 10 times more likely than men to develop bulimia (DSM-IV-TR, 2000). Participants had to meet the inclusion criteria of being female, being 18 or older, and being able to read English to participate.

The mean age of participants was 18.98 (SD = 3.38). Approximately 74% of participants were Caucasian, nearly 18% were African American, 2.5% were Asian American, 2.5% were Hispanic and 2.5% were of another ethnicity. The average Body Mass Index (BMI), which is an indicator of body fatness that takes weight and height into account, was 24.16 (SD = 4.87). This is at the upper reaches of the normal range (18.50-24.90) therefore indicating that approximately half of the sample was in the overweight range (25.00-29.90) (CDC, 2006). The majority of women, 58.6%, reported that they did not perceive themselves as overweight. Additionally, most of the women in this sample, 51.1%, indicated that they were not currently dieting. BMI, the perception of being overweight and engaging in dieting were all significantly correlated (all r 's > .36, p 's < .01). Therefore, women with higher BMIs were more likely to report perceiving

themselves as overweight and actively dieting. Further demographic information about the sample can be seen in Tables 1 and 2.

Materials

Demographics Questionnaire (DQ): The DQ is a 10 item questionnaire designed specifically for this study. It assess basic demographic information such as age and race/ethnicity as well as eating disorder relevant items such as weight, whether or not a person is currently trying to lose weight, and what they desire their weight to be.

Infrequency Scale for Personality Measures (IFS; Chapman & Chapman, 1986): The IFS is a 13-item measure designed to determine whether or not an individual has used a random response pattern to answer questionnaires in a study. Sample items include “On some mornings do you get out of bed when you wake up?” and “Can you remember a time when you talked with someone who wore glasses?” Respondents answer with a “yes” or “no.” Items that are answered in a manner that is inconsistent with the question, for example, indicating that a person has not gotten out of bed some mornings after awakening, receive a score of one. A score greater than two is indicative of a random response pattern and suggests that a person’s response on other questionnaires may not be valid. As items are face valid independently, they are embedded into another questionnaire. In the present study, the IFS questions were embedded in a measure that was not included in this set of analyses.

Bulimia Test-Revised (BULIT-R; Thelen, Farmer, Wonderlich, & Smith, 1991): The BULIT-R is a 36-item instrument designed to measure bulimia nervosa using the

definition set forth in the DSM. The instrument includes eight filler items (questions #6, 11, 19, 20, 27, 29, 31, and 36) that are not scored. Respondents are asked to rate their eating behaviors and attitudes, with each item's Likert scale varying based on the content of the question. Scores range from 28 to 140, with 85 being the recommended clinical cutoff score. In the present study, this measure was used in a dimensional manner.

The measure is normed specifically for women and has excellent psychometric properties with an alpha coefficient of .97 in a sample of 23 bulimic females and 157 normal college women. The BULIT-R is a very stable instrument with a two-month test-retest reliability of .95. Discriminant validity has been demonstrated by Thelen and colleagues (1991) as there was a significant difference between bulimic ($M = 117.95$) and normal ($M = 57.50$) groups in their study, $t(46) = 16.41$, $p < .001$. In order to obtain an overall validity coefficient, Thelen and colleagues (1991) correlated the BULIT-R scores with group membership ($r = .74$, $p < .0001$) and found that BULIT-R scores and diagnoses resulting from clinical interviews are adequate correlates. The validity of the instrument is evidenced in numerous studies of construct, convergent, and discriminant validity.

Eating Disorder Inventory-3 (EDI-3; Garner, 2004): The EDI-3 is a 91 item self-report questionnaire that measures disordered eating behavior and psychological correlates of disordered eating. Individuals rate their feelings, attitudes, and behaviors on a six-point Likert scale (i.e., always, usually, often, sometimes, rarely, or never). The questionnaire yields 12 primary scales and six composite scales that are obtained by adding the T-scores of two or more scales together. Within the 12 primary scales, there

are three eating disorder risk scales that form an Eating Disorder Risk Composite and nine psychological scales (Garner, 2004). The nine psychological scales were not used in this study.

The three eating disorder risk scales are the Drive for Thinness (DT) scale, Bulimia (B) scale, and the Body Dissatisfaction (BD) scale. The DT scale consists of seven items that measure an excessive desire to be thinner, concern with dieting, preoccupation with weight, and an intense fear of gaining weight. The DT scale is very predictive of the severity of eating disorder symptomology. The B scale, which consists of eight items, assesses whether someone is thinking about or engaging in binge eating. It also measures if a person eats in response to being upset. The B scale has been shown to reliably differentiate individuals with AN-BP or BN from those with AN-R. The third eating disorder risk scale, BD, has 10 items that examine discontentment with overall shape and size of various areas of the body that are typically of concern to those with eating disorders (i.e., stomach, hips, thighs, and buttocks) (Garner, 2004).

The composite score of relevance to this study is the Eating Disorder Risk Composite (EDRC). This composite is comprised of the DT, B, and BD scales. The composite is calculated by summing the T-scores for each of these scales. The EDRC yields a global measure of eating concerns and abnormal eating behavior and gives equal weight to each of the contributing scales (Garner, 2004). In the present study, the EDRC was used in analyses as it is the most comprehensive score of disordered eating behavior on the EDI-3.

The EDI-3 is a highly reliable measure. Using a clinical sample of adults diagnosed with eating disorders, the alpha coefficient for DT was 0.87, for B was 0.82, for BD was 0.91, and for the EDRC was 0.93. Test-retest reliability was good with an alpha coefficient of 0.96 for the eating disorder risk scales and composite score (Garner, 2004). Garner (2004) also provides evidence of construct, convergent, and discriminant validity for the EDI-3.

NEO Personality Inventory-Revised (NEO-PI-R; Costa & McCrae, 1992): The NEO-PI-R is a concise self-report measure of the five major dimensions of personality, with six facets for each of the five dimensions. This 240-item self-report measure uses a 5-item Likert Scale (strongly disagree to strongly agree) to respond to items. The psychometric properties of this measure are excellent. The alpha coefficients of the five dimensions, as reported by Costa and McCrae (1992), are as follows: Neuroticism (.93), Extraversion (.90), Openness to Experience (.89), Agreeableness (.95), and Conscientiousness (.92). For the six Neuroticism facets, alpha coefficients range from .69 to .86. The alpha coefficients for the Extraversion facets range from .74 to .82. The Openness to Experience alpha coefficients ranges from .60 to .87. The alpha coefficients for the Agreeableness facets range from .69 to .90. The Conscientiousness facets have alpha coefficients ranging from .70 to .82 (Costa & McCrae, 1992). The NEO-PI-R is widely used in personality research, and numerous studies have provided evidence of construct, convergent, and discriminant validity (McAdams, 2001). The traits measured by the NEO-PI-R are generally stable with stability coefficients ranging from 0.73 to 0.78 (Costa et al., 1999). Furthermore, there is strong interrater reliability between self-reports

and the ratings provided by someone close to the individual on the NEO-PI-R (McCrae & Costa, 1987).

A sample item from the trait of Neuroticism is ‘I often get angry at the way people treat me.’ One item from the Extraversion scale is ‘I really like most people I meet.’ An example of an Openness to Experience item is ‘I have a very active imagination.’ A sample Agreeableness item is ‘I would rather cooperate with others than compete with them.’ An item from the Conscientiousness scale is ‘I am pretty good about pacing myself so as to get things done on time’ (Costa & McCrae, 1992).

Procedure

All participants were informed of confidentiality and that participation was voluntary. The standard ethical conduct code for human participants was followed. This study was approved by the local Institutional Review Board. Prior to administration of the study, the order of the questionnaires was randomized.

Individuals filled out questionnaires in groups of 10 to 35. The researcher or a research assistant was present to administer the questionnaires, answer any questions, and debrief participants. At debriefing, participants were provided with a list of referral sources for therapy, if they wished to pursue this option.

CHAPTER III

RESULTS

Preliminary Analyses

Two subjects who had not completed all measures were removed from the sample. An additional forty subjects were eliminated from the sample due to a score higher than 2 on the IFS, which indicated that these individuals may have utilized a random response pattern. Two more participants were excluded from data analysis as they were age outliers at ages 50 and 56. Thus, the resulting sample included data from 237 women.

The normalcy of the data was assessed by examining the mean and standard deviation and frequency of the study variables (See Tables 1 & 2). Skewness was also assessed and the sample scores were found to be normally distributed. Moreover, the BULIT-R ($\alpha = .94$), EDI-3 ($\alpha = .95$), and the NEO-PI-R factors of N ($\alpha = .90$), E ($\alpha = .87$), O ($\alpha = .87$), A ($\alpha = .86$), and C ($\alpha = .90$) were all found to be highly reliable in this sample. The NEO-PI-R facets were moderately reliable and very similar to Costa and McCrae's (1992) sample with a range of $\alpha = .60-.79$ for N facets, $\alpha = .56-.76$ for E facets, $\alpha = .56-.78$ for O facets, $\alpha = .39-.74$ for A facets and $\alpha = .57-.74$ for C facets.

As the BULIT-R and EDI-3 EDRC were significantly positively correlated, ($r = .80$), a principal components analysis was performed to combine the two measures into one bulimic symptomology factor that yields a score that is indicative of the participant's

endorsed bulimic symptomology. The measures loaded onto one component with a loading of .91 and accounted for 95.1% of the variance. Therefore, in all subsequent analyses, participants' factor scores on the bulimic symptomology factor (BN Factor) were utilized. Also of note, only 6% ($n = 14$) of the sample met clinical cutoff criteria for BN on the BULIT-R.

Some studies (e.g. Atlas, Smith, Hohlstein, McCarthy, & Kroll, 2002) have suggested that ethnic groups of color report fewer risk factors and symptoms of BN while others have found no ethnic or racial differences (e.g., Rand & Kuldau, 1992). Therefore, a t-test was conducted to determine if there were differences in self-reported bulimic symptomology among Caucasians compared to ethnic groups of color in the present study. Results revealed that there was no significant relationship between race and bulimic symptomology $t(234) = 1.81, p = .12$. Due to the large sample size and large number of analyses, the alpha level was set at 0.01 in order to minimize the likelihood of Type I error.

Intercorrelations of the Measures

The zero order correlations between BN Factor and each of the NEO-PI-R domains can be seen in Table 3. Cohen (1992) has suggested that correlations of .10 are indicative of small effect sizes, correlations of .30 indicate medium effect sizes and correlations of .50 and larger representing large effect sizes. The intercorrelations among the NEO-PI-R domains were by and large consistent with those reported by Costa and McCrae (1992) with one exception. In the present sample, Openness to Experience was positively associated with Agreeableness, whereas in Costa and McCrae's (1992) sample,

there was a small negative association. However, in both cases according to Cohen's (1992) definitions, the effects would be small. Zero-order correlations between the BN Factor and NEO-PI-R facets were also computed (Table 4) with most correlations having a small to medium effect size.

Semipartial Correlations

To better account for the shared variance between the NEO-PI-R and BN Factor beyond zero-order correlations, semi-partial correlations between each FFM domain and the BN Factor were computed while controlling for the variance explained by other FFM domains. This in essence creates an "equal horse race" among each of the FFM domains while controlling for the other domains. Table 5 shows the semi-partial r^2 for each of the domains with the BN Factor. As is consistent with Hypothesis 1, Neuroticism accounted for a significant amount of the variance in the BN Factor score. Independent of the other domains, Neuroticism accounted for 16% of the total variance in BN Factor scores. None of the other domains made significant contributions to the BN Factor score above and beyond that of Neuroticism.

Hypothesis One

A hierarchical multiple regression was used to determine if Neuroticism (N) was positively associated with bulimic symptomology. In order to further demonstrate N's unique contribution to BN symptomology, Step 1 of the hierarchical regression partialled out E, O, A and C as predictor variables. Step 2 added in N as a predictor variable. The BN Factor score was the criterion variable. In accordance with Hypothesis 1, as was also seen in the semi-partial correlations, results indicated that N significantly contributed to

the prediction of BN symptomology, $F(5, 235) = 14.03, p < .01$. The hierarchical regression model can be seen in Table 6. The full model including all NEO-PI-R domains accounted for 23.4% of the variance in BN Factor scores.

Hypothesis Two

In order to assess whether trait Anxiety (N1 on the Neuroticism domain) is significantly positively associated with bulimic symptomology, a hierarchical multiple regression was used. Because previous analyses indicated that Neuroticism is the only domain making significant contributions to the variance in BN Factor scores, in Step 1 of the hierarchical analysis, Facets N2-6 were entered as predictor variables to partial out their effects. In Step 2, Anxiety (N1) was entered as the predictor variable with BN Factor scores as the criterion variable. Results indicated that while the model was significant, $F(6, 235) = 12.19, p < .01$, Anxiety (N1) was not significantly associated with BN Factor scores above and beyond the other facets of Neuroticism (Table 7). As can be seen in Table 8, Anxiety (N1) only accounts for 0.6% of the variance in the BN Factor scores.

Interestingly, in examining Hypothesis Two, Depression (N3) emerged as a significant and unique contributor to the variance in BN Factor scores. Depression (N3) accounts for 2% of the variance in BN Factor scores (Table 8). Although no a priori hypothesis was formed about this facet of Neuroticism, this result adds to the understanding of personality variables that are associated with bulimic symptomology.

Hypothesis Three

To examine whether there was a positive association between Impulsiveness (N5) facet scores of Neuroticism and self-reported bulimic symptomology, a hierarchical multiple regression was used. The criterion variable was the BN Factor score. The first step included Facets N1, 2, 3, 4, and 6 as predictor variables to partial out their variance and in Step 2, Impulsiveness (N5) was added. Results indicated that Impulsiveness (N5) uniquely and significantly contributed to the prediction of BN symptomology, $F(6, 235) = 12.19, p < .01$. The hierarchical regression model can be seen in Table 9. The full model including all NEO-PI-R domains accounted for 24.2% of the variance in BN Factor scores. As can be seen in Table 8, Impulsiveness (N5) accounts for 2.6% of the variance in the BN Factor scores.

Hypothesis Four

A hierarchical multiple regression was used to determine if Excitement-Seeking (E5) facet scores of Extraversion were positively associated with self-reported bulimic symptomology. The criterion variable was the BN Factor score. The first step included Neuroticism, Facets 1-4 and 6 of Extraversion, Openness to Experience, Agreeableness, and Conscientiousness as predictor variables to partial out their effects. In Step 2, Excitement-Seeking (E5) was entered in. Results indicated that Excitement-Seeking (E5) uniquely and significantly contributed to the prediction of BN symptomology, $F(10, 235)$

= 8.03, $p < .01$. Excitement-Seeking accounts for 2.5% of the variance in BN Factor scores¹. The hierarchical regression model can be seen in Table 10.

Exploratory Factor Analysis

In order to determine the extent to which BN pathology maps onto the FFM, an exploratory factor analysis was conducted using a promax rotation on the 30 NEO-PI-R facets and the BULIT-R and EDI-3 EDRC. It was expected that the NEO-PI-R facet scores would fall into the FFM structure. The emphasis of this analysis was on whether or not the BULIT-R and EDI-3 EDRC would comprise their own factor or be included in FFM structure. In total, seven factors were extracted with Eigenvalues greater than 1.0 that accounted for 65.34% of the variance. As expected, the NEO-PI-R facet scores replicated the FFM structure with the exception of Openness to Experience, which appeared to break down into two factors. Most importantly, the BN symptomology variables formed their own factor and were not subsumed within FFM space. The rotated factor loadings and percentage of variance accounted for by the factors can be seen in Table 11.

¹ Due to the variability in the reliability of the NEO-PI-R facets, the possibility of a relationship between their reliability and the significance of their relationship with BN was explored. No relationship was found.

CHAPTER IV

DISCUSSION

In the present study, the relationship between FFM personality traits and bulimic symptomology was examined. As hypothesized, higher levels of Neuroticism, Impulsiveness, and Excitement-seeking were positively uniquely associated with bulimic symptomology. Trait anxiety does not appear to be related to bulimic symptomology. Incidentally, trait Depression, or proneness to negative affect, was correlated with bulimic symptomology. Therefore, women who are high in impulsiveness, excitement seeking, and are prone to negative affect may be more likely to display bulimic symptomology². An exploratory factor analysis indicated that bulimic symptomology comprised a separate factor that was not subsumed in the FFM space.

Interpretation of Findings

In interpreting the results of this study, it is essential to acknowledge that due to the design of the study, it is not possible to delineate whether a personality pattern of impulsivity, excitement seeking, and proneness to negative affect is a precursor to, concurrent with, or the result of bulimic symptomology. This study only demonstrates an association between this personality pattern and bulimic symptomology and does not examine causality. Despite this limitation, this is the first study that has shown that FFM

² Exploratory regressions were conducted to examine the relationship between other NEO-PI-R facets and bulimic symptomology to obtain a comprehensive description of the FFM and bulimic symptomology. No additional significant relationships were found.

personality traits vary along the full continuum of bulimic eating behavior and attitudes by examining bulimic symptomology in a continuous or dimensional manner.

While previous research (Brookings & Wilson, 1994; Ghaderi & Scott, 2000; Podar et al., 1999) demonstrated a link between high Neuroticism and eating disorders in general, the present study illuminated a strong relationship between Neuroticism and bulimic symptomology specifically. Neuroticism was the only factor that was significantly related with bulimic symptomology after removing the variance associated with other FFM domains. Independent of the other domains, Neuroticism accounted for 16% of the total variance in BN Factor scores. This finding is consistent with research that has indicated associations between BN and negative affect and susceptibility to distress (e.g., Bloks et al., 2004; Diaz-Marsa et al., 2000). Moreover, this finding is consistent with a meta-analysis that has revealed Neuroticism is robustly associated with psychopathology in general (Malouff, Thorsteinsson, & Schutte, 2005).

Prior research has indicated that individuals with BN report a significant amount of anxiety (e.g., Fairburn & Harrison, 2003) and a tendency to respond to stressful situations with behavioral inhibition, fear, and anxiety (Bloks et al., 2004; Diaz-Marsa et al., 2000). Additionally, Brookings and Wilson (1994) and Podar and colleagues (1999) found a positive association between Anxiety (N1) and eating disorder symptomology; however, these studies did not examine the unique contribution made by Anxiety but rather only used zero-order correlations. While the present study found a significant zero-order correlation between facet Anxiety and bulimic symptomology, this relationship was not significant once the variance associated with the other Neuroticism

facets was partialled out indicating that Anxiety is not a unique contributor to bulimic symptomology. These results suggest it is likely that the significant zero-order correlation between facet Anxiety and bulimic symptomology is due to the shared variance Anxiety has with the other Neuroticism facets.

Consistent with previous research that has demonstrated a relationship between high levels of impulsivity and BN (Claes et al., 2002; Diaz-Marsa et al., 2000; Vervaet et al., 2003; Wonderlich, 2002), facet Impulsiveness was significantly correlated with bulimic symptomology. This relationship remained significant after removing the variance associated with the other Neuroticism facets. Impulsiveness, independent of the other Neuroticism facets, accounted for 2.6% of the variance in bulimic symptomology. This suggests that the inability to control and resist urges and cravings is one personality trait in the FFM that is correlated to increased bulimic symptomology. This finding was in concordance with Brookings and Wilson's (1994) and Podar and colleagues' (1999) findings that Impulsiveness was significantly correlated with eating disordered behaviors and attitudes.

While no apriori hypothesis was formed regarding the relationship between facet Depression and bulimic symptomology, results indicated that there is a positive correlation among these variable. This is consistent with previous research that found significant zero-order correlations between Depression and eating disorder symptomology (Brookings & Wilson, 1994; Podar et al., 1999). However, the present study goes beyond these previous findings by demonstrating that Facet Depression makes a unique contribution to bulimic symptomology even while controlling for other Facets of

Neuroticism. It appears that individuals who are more prone to negative affect are also more likely to report bulimic behaviors and attitudes.

Facet Excitement-Seeking was significantly associated with bulimic symptomology even after removing the variance associated with all the other FFM domains and Extraversion facets. This is consistent with findings that BN is related to high novelty-seeking which is indicative of excitability, extravagance, curiosity (Blocs et al., 2004; Kleifield et al., 1994) but was contradictory to Brookings and Wilson's (1994) and Podar and colleagues' (1999) findings of no significant association between Excitement-Seeking and eating disordered behaviors and attitudes. However, these two studies did not distinguish among types of disordered eating behaviors and attitudes. The results of the present study suggest that individuals who desire excitement and stimulation may be more likely to exhibit bulimic symptomology than those who do not.

The exploratory factor analysis extracted seven factors, four of which appeared to replicate the FFM structure for Neuroticism, Extraversion, Conscientiousness and Agreeableness. Openness to Experience was comprised of two factors in this sample, which may be due to some unknown unique factor present in the sample. Researchers and theorists have pointed out that factor analysis of the FFM does not always yield five domains (Block, 2001) and that Openness to Experience does not always form one domain in a factor analysis unless a certain factor solution is explicitly requested (Aluja, Garcia, & Garcia, 2002; 2004).

Of particular interest in this study, despite the relationships between the BN Factor score and the NEO-PI-R domains and facets, bulimic symptomology did not fall

within FFM space in the exploratory factor analysis. Instead, bulimic symptomology created its own factor. However, the facet scores of Depression and Impulsiveness loaded onto the bulimic symptomology factor, which added to further support to their association with bulimic behaviors and attitudes. The overall results of the factor analysis suggest that bulimic symptomology is a behavioral and cognitive factor that lies outside of the FFM. Moreover, given that two different eating disorder questionnaires were used and bulimia still produced its own factor, we can assume that BN truly is a factor separate from the FFM and that this finding is not simply due to method variance.

While a particular personality pattern did emerge, it is important to bear in mind that being impulsive, excitement-seeking, and prone to negative affect may not just be associated with bulimic symptomology. For example, it is possible that these traits may also be associated with Borderline Personality Disorder. In fact, in a case presented by Bruehl (1994), the individual with Borderline Personality Disorder had very high Neuroticism, very high facet Depression, high facet Impulsiveness, and high facet Excitement-seeking. Seeing some degree of personality trait overlap between BN and Borderline Personality Disorder would not be surprising given their high comorbidity rates (Diaz-Marsa et al., 2000; Wonderlich, 2002).

Given that this personality pattern may be seen in other psychological disorders, this leads to the question of what may prompt an individual to develop BN instead of other difficulties. It is highly likely that other factors often included in etiological models of BN, such as culture, peer influences, familial influences, genetics, and specific experiences influence whether or not an individual develops BN or another disorder if

their personality includes being impulsive, excitement-seeking, and proneness to negative affect. For example, internalization of sociocultural factors may be one reason an individual develops BN over another problem. In the United States, thinness is associated with greater sexual allure, power, health, and self-control (Polivy & Herman, 1987). At the most basic level, women who internalize and endorse this sociocultural ideal are at greater risk for developing BN (Mintz & Betz, 1988; Striegel-Moore et al., 1986). Additionally, peers are also believed to contribute to the development of eating disorders. Young girls may learn attitudes towards weight (i.e., the importance of slimness) and certain behaviors (i.e., purging, dieting) from their peers (Levine, Smolak, Moodey, Shuman, & Hessen, 1994). Peer teasing is also associated with the development of eating disorders (Polivy & Herman, 2002). Individuals who develop another disorder such as Borderline Personality Disorder, may not internalize the thin ideal or may not have peers who value thinness or tease them about their body.

Implications

Prevention. One implication of having identified a personality pattern that is associated with increased bulimic symptomology is that it may allow for early identification of individuals at risk for developing bulimia. Prevention efforts could target those who fit the personality profile associated with bulimic disordered behavior in order to thwart them from moving along in the spectrum to more disordered eating. This is important as prevention resources are often limited and typically cannot be aimed at every girl or woman in our society for financial and logistical reasons. Screenings based on personality profiles as well as eating and weight behaviors and attitudes could occur in

schools or colleges, in settings where eating disorders or excessive weight loss behaviors may manifest such as at the gym, or among high risk groups, such as competitive athletes, gymnasts, dancers, etc. (Davis, Kennedy, Ravelski, & Dionne, 1994; Streigel-Moore et al., 1986).

With the recognition that eating disorders are not simply dichotomous clinical categories but are rather on a spectrum of behaviors and attitudes, the aim of prevention efforts has shifted. As Piran (2002) has pointed out, with this new knowledge it is important to aim prevention efforts at all of the maladaptive gradations of disordered eating, not just BN or AN. Given that individuals who are impulsive, seek excitement, and are prone to negative affect are more likely to report bulimic symptomology in a college population, it may be important for prevention efforts to teach individuals healthy ways of responding to negative affect. Additionally, prevention efforts may be aimed at decreasing impulsiveness. These personality-oriented interventions could be paired with more traditional prevention efforts such as psychoeducation (Piran, 2002).

Treatment. Having a clearer picture of the personality traits associated with increased bulimic symptomology may also have important implications for treatment. Presently, there are two empirically validated treatments for BN: cognitive-behavioral therapy (CBT) and interpersonal therapy (IPT) (Fairburn, 2002a; 2002b) although CBT is the most utilized treatment (Garner & Needleman, 1997). Farmer and Nelson-Gray (2005) noted that personality variables can impact the outcome of behavioral techniques. While we can speculate on possible idiographic useful alterations to therapies for BN, it must be noted that traits themselves do not typically provide us with suggestions on how

to alter treatments to make them more effective with a particular client (Farmer & Nelson-Gray, 2005). Farmer and Nelson-Gray (2005) prefer to individualize treatment based on more functional variables, rather than on personality descriptors. However, Sanderson and Clarkin (1994) have suggested that personality should influence the choice and does affect the process of treatment.

Fairburn, Marcus, and Wilson (1993) have developed a manualized empirically validated CBT treatment for BN. Their treatment is comprised of three stages. In Stage 1, psychoeducation occurs, self-monitoring and weekly weighing are initiated, a behavioral plan is created for establishing a regular eating pattern, and self-control strategies are taught. While most of this stage of treatment is aimed at establishing more healthy patterns of behavior, in light of the finding that personality traits of impulsiveness, excitement-seeking, and proclivity to negative affect are associated with increased bulimic symptomology, some modifications are worth considering. For example, it may be that rather than simply instructing someone to weigh herself only once a week, it would be important to help them develop a list of tasks they could engage in when they had the urge to weigh themselves. Specifically, exciting activities may be a nice personality-based fit given the tendency to seek exhilaration, pleasure, and stimulation. This is also true of the self-control strategies. Fairburn and colleagues (1993) suggest taking walks or baths and listening to music as behaviors to engage in when one has the urge to binge and purge. However, for some individuals, these events may not be stimulating enough, and they therefore may not resist their urges. Exciting

distracting activities after eating and in high-risk situations might possibly be more effective.

In Stage 2 of CBT treatment, patients tackle a hierarchy of their forbidden foods to aid in reducing dietary restraint, learn problem solving skills, and engage in cognitive restructuring (Fairburn et al., 1993). In talking to individuals about working through their food hierarchy, it may be helpful to frame things in terms of the hierarchy being a “conquerable challenge” to cast it in a more exciting light. When addressing cognitive restructuring, particular attention may need to be given to general negative affect and cognitions that are not specifically eating or body related. Distress tolerance skills may be helpful in combating negative affect. Stage 3 focuses on relapse prevention (Fairburn et al., 1993). Continuing to focus on coping strategies that are consistent with the individual’s personality pattern may be beneficial.

As Wilson, Fairburn, and Agras (1997) have pointed out, the most common problem with CBT for BN is that it can become too didactic, leaving clients frustrated and disinclined to change. Instead, they recommend a more Socratic approach to cognitive restructuring. Given that trait excitement-seeking is associated with bulimic symptomology, this recommendation may be very useful. By taking a more Socratic style, the client is actively engaged in the process rather than being more of a recipient of information. This may cater to their need for stimulation and create more investment in the therapeutic process.

Interpersonal therapy for BN also consists of three stages (Fairburn, Kirk, O’Conner, & Cooper, 1986; Klerman & Weissman, 1993). In the first stage, the rationale

and nature of IPT is explained, current interpersonal problems are identified and the focus of treatment is determined. The results of the present study may indicate a need to examine how personality factors are impacting interpersonal relationships. For example, high impulsivity may be causing significant distress in interpersonal relationships. In the second stage, sessions are led by the client and center around a better understanding of the problems areas and attempts to change. Given that individuals high in bulimic symptomology tend to be high in impulsiveness, it may be challenging for clients to remain on task and not discuss irrelevant topics on impulse. However, having IPT structured in a manner that encourages a client to practice controlling their impulses and urges in session may well be beneficial. The final stage of IPT focuses on relapse prevention.

While it is easy to speculate on how the present research study may contribute to modifications of the current empirically validated treatments for BN, research is needed to test out the effectiveness of any modifications. Modifications to treatments could alter their efficacy in either a positive or negative manner. However, given that CBT and IPT result in abstinence from bulimic behaviors for only 40-60% of individuals (Wilson et al., 1997), there is clearly room for improvement.

Facet versus factor. Given that several facets were significant predictors of bulimic symptomology over and above the domains and that facet Impulsiveness and Depression appear to be driving Neuroticism's association with bulimic symptomology, the results of this study appear to support a facet-level approach to personality assessment. Additionally, facet Excitement-seeking had a significant relationship with

bulimic symptomology although Extraversion, its domain, did not. Just examining the domains alone yields the knowledge that Neuroticism is the domain that best relates to bulimic symptomology, but analyses at the facet level add clarification to this relationship. There is an ongoing debate in the personality field about the value and meaningfulness of higher level (i.e., domain) versus lower level (i.e., facet) personality traits. Results of the present study are consistent with other studies that have indicated the importance and value of facet level personality assessment (Ashton, Jackson, Paunonen, Helmes, & Rothstein, 1995; Lee, Ogunfowora, & Ashton, 2005; Paunonen & Ashton, 2001).

Strengths

There are several strengths to this study. The sample size in this study was good with over 200 participants. Moreover, the IFS was included as a validity check on the responses provided by participants, and those who likely used a random response pattern were eliminated from the sample. Unlike Brookings and Wilson (1994), this study utilized the entire FFM and NEO-PI-R. This study also used two measures of bulimic symptomology, even though they were highly correlated with one another. The college sample used in this study was representative of the age range in which BN typically occurs (DSM-IV-TR, 2000).

Another important strength of this study is that it examined the spectrum of bulimic symptomology by taking a continuous approach to data analysis. This is the first study that has examined the associations between the FFM and the spectrum of bulimic symptomology. An additional benefit to this study was that only bulimic symptomology

was examined and included in analyses. Previous researchers exploring the relationship between the FFM and eating disorders have combined all eating disorders together in analyses (Ghaderi & Scott, 2000; Podar et al., 1999). This study corrected for this limitation in prior research. Furthermore, this study took things a step further than previous research (Brookings & Wilson, 1994; Ghaderi & Scott, 2000; Podar et al., 1999) by using analyses that took into account the shared variance of the NEO-PI-R factors and facets in order to determine the unique association between specific traits and bulimic symptomology.

Limitations

Although the present study yielded information about the personality structure of bulimic symptomology in a non-clinical sample, there are several limitations that must be noted. Due to the correlational design of the study, the results do not allow for conclusions to be drawn about whether the personality pattern of impulsiveness, excitement-seeking and proclivity towards negative affect or bulimic symptomology occurs first. Moreover, because this was a nonclinical sample, bulimic symptomology rather than an actual diagnosis of BN was assessed. Therefore, the study did not directly examine the relationship between the FFM and BN. Furthermore, when the clinical cutoff on the BULIT-R was assessed, only 6% of the sample met criteria for BN according to their BULIT-R score, thus indicating the likelihood that only a small portion of the sample may have had BN. Of course, by choice, this study considered bulimic symptomology as a continuous variable. Additionally, the study did not distinguish between purging and nonpurging forms of bulimic symptomology. Neither the EDI-3

nor the BULIT-R was designed for this type of categorization, although DSM-IV-TR (2000) specifies these subtypes.

Only females were included in the study. While this decision is justifiable given that 90% of individuals with BN are female (DSM-IV-TR, 2000), male personality correlates of bulimic symptomology cannot be inferred from this sample. Gender may influence what personality styles are most likely to be associated with bulimic symptomology. Moreover, different racial groups were grouped together rather than analyzed separately due to the small number of participants that were African American, Hispanic or Asian American and the lack of a significant difference in self-report of bulimic symptomology. However, it is possible that the relationship between personality and bulimic symptomology differs by race. In addition, using a conservative alpha level of .01 could have led to failing to see some meaningful findings. However, using a conservative alpha level was justified with a large sample in order to reduce the likelihood of making a Type I error. Furthermore, there are a myriad of possible interaction terms between the predictors that could have been examined, but due to the size of the sample and the vast number of possible interaction terms, this was not possible.

Future Research

Additional research could add further clarity to the findings of this study and to our understanding of the relationship between the FFM and the spectrum of eating disorders. Specifically, a longitudinal study following individuals from childhood through adulthood, thereby encapsulating the time in which individuals typically move

along the spectrum of bulimic behavior, may illuminate the role personality factors have in the development of BN. Such research might also demonstrate the relationship that other factors, such as culture, family, peers and genetics, have in the development of BN and how they interact with personality traits.

Given that BN has two subtypes, Purging and Non-purging, future studies could examine the relationship between the FFM and each of these subtypes. However, in order to conduct such a study, a measure that is able to differentiate among the subtypes is needed. Moreover, a large number of participants would be needed to fully capture the range of behaviors and attitudes associated with both subtypes of BN.

Another direction that future research should take would be to explore FFM differences in the spectrum of bulimic symptomology compared to anorexic symptomology. The personalities of those with BN are considered to be the antithesis of those of individuals with AN (Van Der Ham, Meulman, VanStrien, & Van Engeland, 1997; Vitousek & Manke, 1994) so one could reasonably expect differences in FFM associations. A longitudinal study examining both the bulimic and anorexic spectrums could assess the role that personality traits play in the development of each disorder.

Conclusions

The present study showed an association between the FFM and bulimic symptomology. In particular, high Neuroticism, in particular Facets of Impulsiveness, Excitement-Seeking and Depression were related with higher bulimic symptomology. No meaningful relationship was found between facet Anxiety and bulimic symptomology. Based on an exploratory factor analysis, bulimic symptomology is not

subsumed in FFM space, but rather comprises a separate factor. However, both Impulsiveness and Depression loaded onto the bulimic symptomology factor, adding to further support to their association with bulimic behaviors and attitudes.

This study adds to what was previously known about the FFM and bulimic symptomology. It is the first study to examine the relationship between the FFM and bulimic behaviors and attitudes using the full NEO-PI-R in an American sample. Moreover, it incorporates the spectrum of bulimic symptomology by utilizing a continuous rather than categorical approach to BN.

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APPENDIX A. TABLES

Table 1

Sample Characteristics: Means and Standard Deviations

Sample Characteristics	M	SD	Range
Age	18.98	3.38	18.00-40.00
Body Mass Index	24.16	4.87	14.76-40.72
BULIT-R	48.24	18.60	20.00-114.00
EDI-3 EDRC	91.28	26.61	53.00-167.00
BN Factor	0.00	1.00	-1.33-3.24

Table 2

Demographic Characteristics: Percentages

Sample Characteristics	%	<i>n</i>
Ethnicity		
Caucasian	74.3	176
African American	17.7	42
Asian American	2.5	6
Hispanic	2.5	6
Other	2.5	6
Academic Standing		
Freshman	73.8	175
Sophomore	18.6	44
Junior	3.8	9
Senior	3.8	9
Living Arrangement		
On Campus, With Roommates	70.5	167
Off Campus, With Roommates	20.3	48
Off Campus, Alone	6.3	15
On Campus, Alone	2.5	6
Sorority Status		
Not in a Sorority	94.1	223
In a Sorority	5.9	14

Perception of Being Overweight

Not Overweight	58.6	139
Overweight	40.5	96

Dieting Status

Not Dieting	51.1	121
Currently Dieting	47.3	112

Note. Numbers may not add up to 100% due to missing data.

Table 3

Zero-Order Correlations between the Five Factors and Bulimic Symptomology

Factor	BN	N	E	O	A	C
BN		.47*	-.16	-.10	-.16	-.22*
N			-.43*	-.07	-.32*	-.45*
E				.33*	.18*	.22*
O					.16	-.04
A						.20*

*p < .01; n= 237

Table 4

Zero-Order Correlations between the NEO-PI-R Facets and Bulimic Symptomology

NEO-PI-R Facet	BN Factor
Anxiety (N1)	.26*
Angry Hostility (N2)	.21*
Depression (N3)	.43*
Self Consciousness (N4)	.36*
Impulsiveness (N5)	.35*
Vulnerability (N6)	.40*
Warmth (E1)	-.17*
Gregariousness (E2)	-.12
Assertiveness (E3)	-.18*
Activity (E4)	-.10
Excitement Seeking (E5)	.17*
Positive Emotion (E6)	-.25*
Fantasy (O1)	-.03
Aesthetics (O2)	-.14
Feelings (O3)	-.08
Actions (O4)	-.10
Ideas (O5)	-.11
Values (O6)	-.02
Trust (A1)	-.26*
Straightforwardness (A2)	-.17*
Altruism (A3)	-.16*
Compliance (A4)	-.06
Modesty (A5)	.05
Tender-Mindedness (A6)	-.09
Competence (C1)	-.26*
Order (C2)	.02
Dutifulness (C3)	-.20*
Achievement Striving (C4)	-.23*
Self-Discipline (C5)	-.27*
Deliberation (C6)	-.13

*p < .01

Table 5

Semi-partial r^2 of the NEO-PI-R domain scores and the BN Factor Scores with remaining NEO-PI-R domains partialled out

	BN Factor
N	.160*
E	.005
O	.007
A	.000
C	.000

*p <.01

Table 6

Hierarchical Regression Model for Prediction of Neuroticism's Contribution to Bulimic Symptomology

Variable	B	SE	β	R ²	ΔR^2
Step 1				.074	.074
E	.005	.004	-.082		
O	-.004	.004	-.063		
A	-.006	.004	-.095		
C	-.010	.004	-.188*		
Step 2				.234	.160*
E	.005	.004	.084		
O	-.005	.004	-.089		
A	-.000	.004	.006		
C	-.001	.004	-.015		
N	.025	.004	.498*		

*p < .01

Table 7

Hierarchical Regression Model for Prediction of Facet Anxiety's Contribution to Bulimic Symptomology

Variable	B	SE	β	R ²	ΔR^2
Step 1				.236	.236*
N (Ang Hostil)	-.010	.015	-.048		
N (Depress)	.038	.017	.205		
N (Self-Consc)	.028	.017	.123		
N (Impulsive)	.043	.016	.183*		
N (Vulnerable)	.033	.021	.130		
Step 2				.242	.006
N (Ang Hostil)	-.008	.015	-.035		
N (Depress)	.042	.017	.223*		
N (Self-Consc)	.035	.018	.154		
N (Impulsive)	.044	.016	.185*		
N (Vulnerable)	.042	.022	.163		
N (Anxiety)	-.025	.018	-.113		

*p < .01

Table 8

Semi-partial r^2 of the NEO-PI-R Neuroticism facet scores and the BN Factor Scores with remaining Neuroticism facets partialled out

	BN Factor
Anxiety (N1)	.006
Angry Hostility (N2)	.001
Depression (N3)	.020*
Self-Consciousness (N4)	.013
Impulsiveness (N5)	.026*
Vulnerability (N6)	.012

*p < .01

Table 9

Hierarchical Regression Model for Prediction of Facet Impulsiveness' Contribution to Bulimic Symptomology

Variable	B	SE	β	R ²	ΔR^2
Step 1				.216	.216*
N1 (Anxiety)	-.023	.018	-.106		
N2 (Ang Host)	-.001	.015	-.006		
N3 (Depress)	.047	.017	.253		
N4 (Self-Con)	.036	.018	.155		
N6 (Vuln)	.053	.022	.209		
Step 2				.242	.026*
N1 (Anxiety)	-.025	.018	-.113		
N2 (Ang Host)	-.008	.015	-.035		
N3 (Depress)	.042	.017	.223*		
N4 (Self-Con)	.035	.018	.154		
N6 (Vuln)	.042	.022	.163		
N5 (Impuls)	.044	.016	.185*		

*p < .01

Table 10

Hierarchical Regression Model for Prediction of Facet Excitement-Seeking's Contribution to Bulimic Symptomology

Variable	B	SE	β	R^2	ΔR^2
Step 1				.238	.238*
N	.023	.004	.457*		
O	-.002	.004	-.037		
A	-.002	.005	-.027		
C	.000	.004	-.004		
E (Warmth)	.013	.024	.051		
E (Gregar)	.006	.016	.030		
E (Assert)	-.018	.017	-.086		
E (Activity)	.020	.019	.075		
E (Pos Emot)	-.016	.019	-.068		
Step 2				.263	.025*
N	.023	.004	.465*		
O	-.004	.004	-.075		
A	.002	.005	.033		
C	.001	.004	.016		
E (Warmth)	.006	.024	.023		
E (Gregar)	-.006	.016	-.031		
E (Assert)	-.016	.017	-.073		
E (Activity)	.013	.019	.047		
E (Pos Emot)	-.018	.019	-.078		
E (Exc Seek)	.049	.018	.192*		

* $p < .01$

Table 11

Rotated 7-factor solution for the NEO-PI-R facet and Bulimic Symptomology scores^a

	Factors						
	1	2	3	4	5	6	7
BULIT-R	-.273	-.159	.317	-.143	-.066	.892	-.083
EDI-3 EDRC	-.227	-.170	.371	-.178	-.117	.881	-.151
Anxiety (N1)	-.205	-.137	.814	-.336	.098	.199	-.099
Angry Hostility (N2)	-.278	-.695	.527	-.299	-.119	.187	-.110
Depression (N3)	-.476	-.232	.807	-.326	-.136	.427	-.030
Self Consciousness (N4)	-.182	-.056	.729	-.429	-.105	.278	-.068
Impulsiveness (N5)	-.527	-.354	.515	.036	.084	.403	-.015
Vulnerability (N6)	-.482	-.192	.801	-.294	-.179	.356	-.111
Warmth (E1)	.253	.478	-.220	.758	.478	-.241	.182
Gregariousness (E2)	-.001	.095	-.321	.788	.176	-.108	-.041
Assertiveness (E3)	.298	-.338	-.301	.568	.226	-.225	.258
Activity (E4)	.300	-.066	-.285	.652	-.027	-.93	.198
Excitement Seeking (E5)	-.117	-.231	-.241	.540	.346	.246	.101
Positive Emotion (E6)	.249	.369	-.301	.671	.423	-.343	.326
Fantasy (O1)	-.190	-.009	.204	.207	.606	-.088	.439
Aesthetics (O2)	.014	.107	.038	.219	.430	-.196	.752
Feelings (O3)	.025	.024	.084	.381	.779	-.163	.341

Actions (O4)	-131	-.055	-.448	.280	.149	.039	.550
Ideas (O5)	.181	.034	-.117	.153	.291	-.128	.822
Values (O6)	-.084	-.068	-.103	.040	.638	.001	.346
Trust (A1)	.277	.589	-.237	.444	.078	-.379	.156
Straightforwardness (A2)	.268	.764	-.087	.097	.184	-.265	-.126
Altruism (A3)	.267	.663	-.148	.376	.572	-.213	.031
Compliance (A4)	.093	.746	-.158	-.065	-.064	-.032	.011
Modesty (A5)	-.170	.537	.309	-.196	.093	-.040	-.050
Tender-Mindedness (A6)	.125	.496	-.158	.184	.615	-.091	-.035
Competence (C1)	.775	.139	-.258	.287	.197	-.358	.206
Order (C2)	.646	-.094	-.020	.037	-.066	.049	-.046
Dutifulness (C3)	.765	.450	-.207	.219	.081	-.292	-.191
Achievement Striving (C4)	.756	.088	-.250	.347	-.057	-.334	.205
Self-Discipline (C5)	.845	.171	-.402	.170	-.001	-.326	.094
Deliberation (C6)	.696	.292	-.250	-.144	-.104	-.130	-.128
% of variance accounted	22.74	11.54	10.06	7.34	6.03	4.26	3.43

Note. Factor loadings greater than 0.40 bolded in the table.

APPENDIX B

THE UNIVERSITY OF NORTH CAROLINA **GREENSBORO**

CONSENT TO ACT AS A HUMAN PARTICIPANT

Project Title: Adult Functioning and Models of Personality

Project Directors: Amanda Cobb, M.A. and Rosemary Nelson-Gray, Ph.D.

Participant's Name: _____

DESCRIPTION AND EXPLANATION OF PROCEDURES:

This project is designed to examine how different traits are related to people's overall functioning. Participation involves completing 11 questionnaires and will not take more than two hours. These questionnaires focus on demographic information, your eating habits, your use of alcohol and drugs, and your personality. For your participation, as an introductory psychology student you will be given experimental credits for the time you spend completing questionnaires and participating in this research project. Only females who are 18 or older are eligible to participate in the study. A copy of this consent form will be given to you as you leave the study.

RISKS AND DISCOMFORTS:

You may become mildly uncomfortable during your participation in this project because of the questions you will be asked. Any distress you may feel is not likely to be any greater than that experienced in daily living. Your participation in the project is entirely voluntary and, should you become uncomfortable or distressed, you are free to refrain from answering any questions and withdraw from the study altogether at any point without penalty or prejudice. You are also free to ask questions about this study to the researcher or researcher assistant running this study before, during or after your participation in this project.

All information that you give and questions you answer during the project will be kept in confidentiality. No information you provide will identify you personally in publications or presentations. Data will be kept in a secured site and destroyed after 5 years.

Some of the questions will ask you about illegal activities you may have engage in. Please respond truthfully to these questions and be assured of your confidentiality. The principal investigator and research assistants involved in the study are required to sign confidentiality agreements. Only the principle investigator and research assistants who have signed confidentiality agreements will handle completed materials. All the information that you provide and all the information that you answer during the course of this project will be kept in strict confidentiality.

POTENTIAL BENEFITS:

Participants will benefit from a better understanding of issues related to psychological research and will have an opportunity to learn more about themselves through responses to questionnaires. Broader benefits will enable researchers and clinicians to better understand the

overall functioning of adults and lead to better treatment programs for adults having difficulty in their overall functioning.

CONSENT:

By signing this consent form, you agree that you understand the procedures and any risks and benefits involved in this research. You are free to refuse to participate or to withdraw your consent to participate in this research at any time without penalty or prejudice; your participation is entirely voluntary. Your privacy will be protected because you will not be identified by name as a participant in this project.

The research and this consent form have been approved by the University of North Carolina at Greensboro Institutional Review Board, which insures that research involving people follows federal regulations. Questions regarding your rights as a participant in this project can be answered by calling Mr. Eric Allen at (336) 256-1482. Questions regarding the research itself will be answered by Amanda Cobb by calling 256-0061. Any new information that develops during the project will be provided to you if the information might affect your willingness to continue participation in the project.

By signing this form, you are agreeing to participate in the project described to you by either Amanda Cobb or the research assistant running this project.

Participant's Signature*

Date

APPENDIX C

General Information Questionnaire

Age _____

Current body weight in pounds _____

Race/Ethnicity:

Current height in inches _____

African American

Do you think you are presently overweight?

Asian American

Yes

Caucasian

No

Hispanic

Other

Are you currently dieting to lose weight?

Current Living Arrangement:

Yes

On Campus, Alone

No

On Campus, With Roommates

Off Campus, Alone

What weight would you like to be _____

Off Campus, With Roommates

Current Academic Standing:

Are you a member of a sorority?

Freshman

Yes

Sophomore

No

Junior

Senior

APPENDIX D

Infrequency Scale

Answer each question by answering Yes or No. (*The questions will be embedded in another questionnaire).

- Y N 1) On some mornings, do you get out of bed when you wake up?
- Y N 2) Have there been a number of occasions when people you have known said hello to you?
- Y N 3) Have there been times when you have dialed a telephone number only to find that the line was busy?
- Y N 4) At times when you were ill or tired, have you felt like going to bed early?
- Y N 5) On some occasions, have you noticed that some other people are better dressed than you?
- Y N 6) Is driving from New York to San Francisco generally faster than flying between these cities?
- Y N 7) Are most light bulbs powered by electricity.
- Y N 8) Do you go at least one every two years to visit either northern Scotland or some part of Scandinavia.
- Y N 9) Can you remember a time when you talked with someone who wore glasses?
- Y N 10) Sometimes when you walk down the sidewalk, do you see children playing?
- Y N 11) Have you ever combed your hair before going out in the morning.
- Y N 12) Do you often walk with a limp, which is the result of a skydiving accident?
- Y N 13) Can you remember a single occasion when you have ridden on a bus?

APPENDIX E

Bulimia Test-Revised

Answer each question by choosing the one answer that represents your experience. Please respond to each item as honestly as possible; remember, all of the information you provide will be kept strictly confidential.

1) I am satisfied with my eating patterns

- Agree
- Neutral
- Disagree a little
- Disagree
- Disagree strongly

2) Would you presently call yourself a “binge eater?”

- Yes, absolutely
- Yes
- Yes probably
- Yes, possibly
- No, probably not

3) Do you feel you have control over the amount of food you consume?

- Most or all of the time
- A lot of the time
- Occasionally
- Rarely
- Never

4) I am satisfied with the shape and size of my body.

- Frequently or always
- Sometimes
- Occasionally
- Rarely
- Seldom or never

5) When I feel that my eating behavior is out of control, I try to take rather extreme measures to get back on course (strict dieting, fasting, laxatives, diuretics, self-induced vomiting or vigorous exercise).

- Always
- Almost always

- Frequently
 Sometimes
 Never or my eating behavior is never out of control
- 6) I use laxatives or suppositories to help control my weight.
- Once a day or more
 3-6 times a week
 Once or twice a week
 2-3 times a month
 Once a month or less (or never)
- 7) I am obsessed about the size and shape of my body.
- Always
 Almost always
 Frequently
 Sometimes
 Seldom or never
- 8) There are times when I rapidly eat a very large amount of food.
- More than twice a week
 Twice a week
 Once a week
 2-3 times a month
 Once a month or less (or never)
- 9) How long have you been binge eating (eating uncontrollably to the point of stuffing yourself)?
- Not applicable; I don't binge eat
 Less than 3 months
 3 months to 1 year
 1-3 years
 3 years or more
- 10) Most people I know would be amazed if they knew how much food I can consume in one sitting.
- Without a doubt
 Very probably
 Probably
 Possibly
 No
- 11) I exercise to burn calories.
- More than 2 hours per day
 About 2 hours per day
 More than 1 hour but less than 2 hours per day

- One hour or less per day
- I exercise but not to burn calories or I don't exercise

12) Compared with women your age, how preoccupied are you about your weight and body shape?

- A great deal more than average
- Much more than average
- More than average
- A little more than average
- Average or less than average

13) I am afraid to eat anything for fear that I won't be able to stop.

- Always
- Almost always
- Frequently
- Sometimes
- Seldom or never

14) I feel tormented by the idea that I am fat or might gain weight.

- Always
- Almost always
- Frequently
- Sometimes
- Seldom or never

15) How often do you intentionally vomit after eating?

- 2 or more times a week
- Once a week
- 2-3 times a month
- Once a month
- Less than once a month or never

16) I eat a lot of food when I am not even hungry.

- Always
- Almost always
- Frequently
- Sometimes
- Seldom or never

17) My eating patterns are different from the eating patterns of most people.

- Always
- Almost always
- Frequently
- Sometimes

Seldom or never

18) After I binge eat, I turn to one of several strict methods to try to keep from gaining weight (vigorous exercise, strict dieting, fasting, self-induced vomiting, laxatives or diuretics).

- Never or I don't binge eat
- Rarely
- Occasionally
- A lot of the time
- Most or all of the time

19) I have tried to lose weight by fasting or going on strict diets.

- Not in the past year
- Once in the past year
- 2-3 times in the past year
- 4-5 times in the past year
- More than 5 times in the past year

20) I exercise vigorously and for long periods of time in order to burn calories.

- Average or less than average
- A little more than average
- More than average
- Much more than average
- A great deal more than average

21) When engaged in an eating binge, I tend to eat foods that are high in carbohydrates (sweets and starches).

- Always
- Almost always
- Frequently
- Sometimes
- Seldom or never

22) Compared to most people, my ability to control my eating behavior seems to be:

- Greater than others' ability
- About the same
- Less
- Much less
- I have absolutely no control

23) I would presently label myself a "compulsive eater" (one who engages in episodes of uncontrolled eating).

- Always
- Almost always

- Frequently
- Sometimes
- Seldom or never

24) I hate the way my body looks after I eat too much.

- Seldom or never
- Sometimes
- Frequently
- Almost always
- Always

25) When I am trying to keep from gaining weight, I feel that I have to resort to vigorous exercise, strict dieting, fasting, self-induced vomiting, laxatives or diuretics.

- Never
- Rarely
- Occasionally
- A lot of the time
- Most or all of the time

26) Do you believe that it is easier for you to vomit than it is for most people?

- Yes, it's no problem at all for me.
- Yes, it's easier
- Yes, it's a little easier
- About the same
- No, its less easy

27) I use diuretics (water pills) to help control my weight.

- Never
- Rarely
- Occasionally
- A lot of the time
- Most of the time

28) I feel that food controls my life.

- Always
- Almost always
- Frequently
- Sometimes
- Seldom or never

29) I try to control my weight by eating little or no food for a day or longer.

- Never
- Seldom
- Sometimes

- Frequently
 Very frequently
- 30) When consuming a large quantity of food, at what rate of speed do you usually eat?
 More rapidly than most people have ever seen in their lives
 A lot more rapidly than most people
 A little more rapidly than most
 About the same rate as most people
 More slowly than most people (or not applicable)
- 31) I use laxatives to help control my weight.
 Never
 Seldom
 Sometimes
 Frequently
 Very frequently
- 32) Right after I binge eat I feel:
 So fat and bloated I can't stand it
 Extremely fat
 Fat
 A little fat
 OK about how my body looks or I never
- 33) Compared to other people of my sex, my ability to always feel in control of how much I eat is:
 About the same or greater
 A little less
 Less
 Much less
 A great deal less
- 34) In the last 3 months, on average, how often did you binge eat (eat uncontrollably to the point of stuffing yourself)?
 Once a month or less (or never)
 2-3 times a month
 Once a week
 Twice a week
 More than twice a week
- 35) Most people I know would be surprised at how fat I look after I eat a lot of food.
 Yes, definitely
 Yes
 Yes probably

- Yes, possibly
- No, probably not or I never eat a lot of food.

36) I use diuretics (water pills) to help control my weight.

- 3 times a week or more
- Once or twice a week
- 2-3 times a month
- Once a month
- Never

APPENDIX F

NEO-Personality Inventory-Revised

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Resources, 16204 N. Florida Ave., Lutz, Florida, 33549.

APPENDIX G

Eating Disorder Inventory-3

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