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The Relationship of Interpersonal Sensitivity, Identity Impairment, and Binge Eating Disorder

among College Women

by

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Thesis

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Abstract

This study explored the association of identity impairment and interpersonal sensitivity (IPS) with binge eating disorder (BED). A convenience sample of 295 female undergraduate psychology students from a large Midwestern university was recruited to complete an online survey. Three primary hypotheses were tested: (1) IPS (high fear of negative evaluation and self-consciousness) would be associated with binge eating; (2) Identity impairment (few total and positive possible selves, many negative possible selves, and a high ratio of negative to total possible selves) would be associated with binge eating; and 3) There would be a significant interaction between identity impairment and IPS on binge eating. Results showed that IPS and negative possible selves were significantly associated with binge eating, and there was an interaction effect for fear of negative evaluation and negative possible selves. Results suggest that IPS, and to a lesser extent, identity impairment should be addressed when treating binge eating.

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Introduction

Despite the increased attention Binge Eating Disorder (BED) is receiving due to its proposed inclusion as a freestanding disorder in the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5), more research is needed. Anorexia nervosa and bulimia nervosa have received considerable attention in the eating disorders literature, but BED remains a related but less understood phenomenon. The essential features of the diagnostic criteria for BED are "recurrent episodes of binge eating with subjective and behavioral indicators of impaired control over, and significant distress about, the binge eating and the absence of the regular use of inappropriate compensatory behaviors that are characteristic of Bulimia Nervosa" (DSM-IV-TR, 2000, p. 785).

BED is associated with negative consequences such as gastrointestinal distress and obesity (Craighead, Miklowitz, & Craighead, 2008, p. 439). Prevalence rates of BED vary from 1-3% (Dingemans, Bruna, & van Furth, 2002; Streigel-Moore & Franko, 2003) to 8.5 % (Johnson, Spitzer, & Williams, 2001), with studies using samples of female primary care patients finding higher rates than those using samples from the general population.

Due to the negative consequences of BED, it is important to understand who is at risk. Impairments in identity and self-concept have been linked to multiple detrimental behaviors, such as bulimia, anorexia, cigarette use, and alcoholism (e.g. Corte & Stein, 2005; Kendzierski, 2007; Shadel & Mermelstein, 1996). Because identity impairment is linked to other maladaptive behaviors, investigating the identity of individuals who binge eat may increase understanding of risk factors for developing BED.

In the literature, self-concept and identity are often used interchangeably. The self-concept model conceptualizes identity as comprised of a constellation of self-schemas (Markus & Nurius, 1986). Self-schemas are defined as individual conceptions of the self that shape behavior and emotion. In this study, self-schemas were assessed using the possible selves theory put forth by Markus and Nurius (1986). Self-schemas and possible selves will be explored in greater detail later.

In addition to identity, this study explored interpersonal sensitivity. Interpersonal sensitivity (IPS) refers to unnecessary and extreme awareness and responsiveness to the feelings and actions of others (Boyce & Parker, 1989). Studies have explored the relationship between bulimia and IPS (e.g. Streigel-Moore, Silberstein, & Rodin, 1993), but little is known about the role IPS plays in the development or maintenance of BED. This study was designed to test the hypothesis that IPS is a risk factor for maladaptive behaviors intended to manage social anxiety, specifically binge eating.

This study explored the relationship between identity impairment, IPS, and BED among college women. The purpose of this study was to explore the extent to which identity impairment and IPS may put college women at risk for BED. The literature review that follows will describe relevant empirical studies involving identity and self-concept, maladaptive behavior related to identity impairment, IPS, and available research on binge eating and BED. A need to expand the literature involving BED will be highlighted.

Eating Disorders among College Students

Mintz and Betz (1988) found that while eating disorders were rare, disordered eating behaviors that did not meet full diagnostic criteria were prevalent in their sample

of female undergraduates. The variables of interest included weight management behaviors, body image, self-esteem, and adherence to sociocultural ideals of thinness. Participants were classified into one of six categories: normals, bulimics, bingers, purgers, chronic dieters, and subthreshold bulimics (anorexic and obese categories were not included in the study). Participant categorization was based on responses to the Weight Management, Eating, and Exercise Habits Questionnaire (Ousley, 1986). Dieting was a frequent occurrence in this sample, as 82% of participants described engaging in at least one dieting behavior daily, and 33% reported more harmful forms of weight management, such as the use of laxatives or vomiting. Additionally, binge eating was reported by 38% of participants. These results indicate that it is common for college women to be concerned with weight management and that this concern often leads to dangerous behavior aimed at controlling weight. The prevalence of binge eating in this sample supports the established finding that such episodes often follow restrictive eating behavior (Wardle & Beinhart, 1981).

Additionally, most female college students who seek campus-based treatment for disordered eating are diagnosed with Eating Disorder Not Otherwise Specified (EDNOS) (e.g., Schwitzer et al., 2002). Schwitzer, Rodriguez, Thomas, and Salmi (2001) found that 80% of their sample of undergraduate college women engaged in problematic binge eating, which suggests that many women who are diagnosed with EDNOS may be better classified as having BED.

Less is known specifically about BED among college students, though some information is available. For example, self-concept has been found to play a role in eating behaviors, as college students who believed they were overweight were significantly

more likely to binge eat (Saules et al., 2009). Of overweight participants who identified themselves as being overweight, 42.6% percent engaged in binge eating. Of overweight participants who did not view themselves as overweight, only 30.1% reported engaging in binge eating. Among participants who were not overweight but believed they were, 43.2% engaged in binge eating, compared to 32.9% of those who were not overweight and did not think they were engaged in binge eating. Results indicated that identifying oneself as overweight was strongly related to binge eating behavior. Furthermore, this Weight Problem Perception (WPP) variable contributed to the prediction of BED beyond what could be predicted by sex, BMI, and depression.

Stein and Hedger (1997) found similar results in a study examining the stability of the body weight and shape self-schema. In a sample of adolescent girls who were transitioning from middle school to high school, those who defined themselves as fat or out-of-shape had higher depression and dieting scores and lower self-esteem, appearance, and athletic competence scores than did girls who defined themselves as "slim/athletic."

Additionally, it has been found that the combination of high levels of perfectionism, a low sense of self-efficacy, and viewing oneself as overweight was predictive of bulimic symptoms such as binge eating (Bardone-Cone, Abramson, Vohs, Heatherton, & Joiner Jr., 2006). While these findings are intriguing, more studies are needed to explore the magnitude and nature of the connection between BED and self-concept.

Identity and Self-concept

Self-concept is generally referred to as a construct that encompasses an individual as a whole and is often used to represent the same construct as identity (Markus &

Nurius, 1986). Cognitive approaches to self-concept often discuss self-schemas, which can be defined as "cognitive generalizations about the self, derived from past experience, that organize and guide the processing of self-related information contained in the individual's social experiences" (Markus, 1977, p. 64).

Self-schemas may be specific or general (Markus, 1977). Specific schemas are related to particular situations in which an individual behaves a certain way. One example of a specific self-schema is the following: "I am shy at parties where I don't know many people." General schemas are evident in an individual's overall self-evaluation and influence subsequent behavior. An example of a general schema is the following: "I am shy."

Additionally, schemas may be positive or negative. Positive schemas promote behavior in accordance with the schema (Corte & Zucker, 2008). For example, viewing oneself as funny is an example of a positive self-schema, which would prompt an individual to continue the behavior. Conversely, negative schemas deter behavior related to the schema. Negative self-schemas include believing one is unattractive, which may negatively impact an individual's social or sexual life. In other words, positive self-schemas are beneficial to the individual who holds them, and negative self-schemas are problematic (Corte & Zucker, 2008).

Some schemas function together as an interrelated unit, while others exist independently. Schematic units form when several schemas are repeatedly activated together (Stein & Corte, 2007). It is believed that interrelated schemas are less diverse and thus less adaptive than independent schemas. Furthermore, interrelated schemas may result from a poorly formed structure of identity. Stein and Corte (2007) tested these

assertions in the context of eating disorders. Women with anorexia or bulimia and a group of controls were given 52 blank index cards and were instructed to write down all of the attributes that were important to who they were. Participants were told to write one self-defining attribute per card, and they could use as many cards as necessary to describe themselves. Participants then rated the importance of each of the attributes and labeled them as positive, negative, or neutral. In addition, participants performed an emotional Stroop task in which individual adjectives appeared on the screen, including words related to body weight. Using the computer mouse, participants clicked on one of two buttons on the screen, labeled "me" and "not me," depending on whether or not they believed the adjective described them. Response time was measured in milliseconds.

Results showed that women with anorexia and bulimia were more likely than controls to have interrelated schemas, as well as more negative and fewer positive schemas. Interrelated schemas are not as adaptive as independent schemas because they activate an all-or-nothing sequence, which is too general a system. Interrelated schemas are especially problematic when they consist of many negative schemas. As Stein and Corte (2007) explain, women with self-concepts that are made up of this combination of self-schemas "lack the diverse array of interests, commitments, strategies, and positive affects necessary to facilitate active and meaningful goal directed behaviors in a diverse array of domains, and, simultaneously, will be more likely to experience negative affects, behavioral avoidance and inhibitions stemming from the negative self-views" (p. 60, 2007).

Though the eating disordered women had more interrelated schemas than controls, this did not predict the availability of a fat self-schema. The fat self-schema is a

construct similar to the aforementioned Weight Perception Problem, in which individuals label themselves as fat. Instead, interrelatedness was associated with the drive for thinness, which is a concept that is more relevant to anorexia than bulimia or BED. Therefore, the interrelatedness of schemas was not measured in this study.

On the Stroop task, the response latency to make "not me" judgments regarding "fat adjectives" was much slower for bulimic women than the anorexic and control participants. These findings are consistent with previous studies demonstrating that individuals with a self-schema in a domain make "not me" judgments more slowly than do individuals who do not have a self-schema in that domain (Markus, 1977; Markus, Hamill, & Sentis, 1987).

The identity impairment model has received further support in the eating disorder literature (e.g. Stein, 2006; Stein & Corte, 2008). In one application of the model, a baseline for the number and organization of self-schemas along with the availability in memory of a fat self-schema was assessed in a sample of college women with subthreshold eating disorders (Stein & Corte, 2008). Compared with controls, women who exhibited disordered eating behaviors were more likely to have impaired identities, as evidenced by few positive and many negative self-schemas. These self-concept disturbances were predictive of the availability of a fat self-schema. The availability of a fat self-schema was in turn predictive of disordered eating behavior.

Possible Selves Schemas. A specific model of self-schemas known as "possible selves" is of importance when considering future behavior and likelihood of change. A "possible self" is defined as how an individual views her future potential and also encompasses her ideal self (Markus & Nurius, 1986). Though possible selves are

representations of future selves, they are derived from representations of the self in the past. According to Markus and Nirius (1986), many possible selves are "a direct result of previous social comparisons in which the individual's own thoughts, feelings, characteristics, and behaviors have been contrasted to those of salient others. What others are now, I could become" (954).

Possible selves serve as cognitive representations of stable goals, aspirations, motives, fears, and threats and thus motivate behavior related to these cognitions. The affective states associated with possible selves are important forces that encourage action. For example, positive affect related to a "successful" possible self will encourage an individual to take action to achieve success. Additionally, incongruity between current views of the self and desired future selves facilitates changes in behavior. Thus, possible selves are important when considering the likelihood of behavior change. It is easier for an individual to conceptualize changing behavior if the individual has incorporated the desired change into a possible self (Oyserman, Terry, & Bybee, 2002; Stein & Markus, 1996). Furthermore, behavioral activation can be disrupted if an individual does not have a fully formed possible self in the domain specifically related to the behavior.

It has been found that self-schemas moderate the relationship between intentions and behavior (Sheeran & Orbell, 2000). If individuals have both a behavioral intention and a schema in that domain, they are significantly more likely to perform the behavior than if no schema exists. This indicates that good intentions for behavior change are likely to be insufficient if there is not a fully formed possible self in the domain of interest.

Possible selves may also be unified or differentiated. Self-schemas are considered differentiated if there is a large number of distinct attributes contained within the self-concept. The sum of possible selves has been shown to be inversely related to psychopathology, with a high sum of possible selves being indicative of healthy levels of functioning (Penland et al., 2000; Stein & Markus, 1994).

In an early study of possible selves, a sample of 210 college students completed a measure that was composed of 150 items. The items assessed six categories reflective of possible selves: a) adjectives generally found in self-concept inventories, b) physical descriptors, c) life-style possibilities, d) general abilities, e) possibilities for occupations, and f) possibilities relating to the opinions of others. A third of the possible selves were positive, a third were negative, and a third were neutral. For each item, respondents were asked if the item described them currently, if it had ever described them in the past, whether the item was ever considered as a possible self, how probable the possible self was for them, and how much they would like the item to be true for them. Results showed that the average number of possible selves that participants endorsed was 80, with a range from 32 to 147. In this sample, there was a bias for endorsing positive possible selves (such as "rich," "admired," and "a good parent"). The possible selves that were least likely to be endorsed were negative items such as the possibility of becoming a welfare recipient or a spouse or child abuser. The average ratio of positive possible selves to negative selves endorsed was almost four to one. All of the positive items were endorsed as possible by 44% of the sample, while only 3% of participants endorsed all of the negative items. In addition, 65% of participants reported that they thought about

themselves in the future "a great deal of the time" or "all of the time" (Markus & Nurius, 1986).

Similar to the idea of positive and negative possible selves is the concept of feared and hoped-for selves. Feared possible selves are undesired future possibilities, while hoped-for possible selves are desired future possibilities. A related concept is that of expected selves. One way of organizing these selves is through balance. More specifically, the desire to avoid a negative or feared self can motivate an individual to achieve the balancing positive self (Kuhl & Beckmann, 1985). For example, if an individual has a positive possible self of losing weight, the balance of a feared possible self that relates to the consequences of overeating can provide further motivation to achieve the positive possible self.

Delinquent teenagers are more likely to have an imbalance between feared and hoped-for selves (Oyserman & Markus, 1990). Balance is defined as an individual having an expected possible self that was offset by a countervailing feared possible self in the same domain. In an open-ended possible selves measure, participants were asked to list three possible selves that they most hoped would describe them in the next year, three possible selves that were mostly likely to be true of them in the next year, and three possible selves they feared or worried about being true in the next year. The nondelinquent youths were more likely to have balanced possible selves than delinquent youths. More than 81% of nondelinquent youth had at least one set of balanced expected and feared possible selves. This was true for only 37% of delinquent youths.

The present study differs from the available research on BED and self-concept by including possible selves. It was hypothesized that this inclusion would help provide a

better understanding of the self-concept of college women with BED, as possible selves

provide a broad context of behaviors, intentions, and goals. This study aimed to test the

hypothesis that identity impairment (as shown by a low total of possible selves, a high

total of negative possible selves, few positive possible selves, and a high ratio of negative

to total possible selves) is related to BED. Depression was controlled because depressed

individuals are more likely to endorse fewer total possible selves, fewer positive possible

selves, and more negative possible selves than are non-depressed individuals (e.g.,

Penland, Masten, Zelhart, Fournet, & Callahan, 2000).

Interpersonal Sensitivity and Eating Disorders

Persons with high levels of IPS may be at increased risk for developing an eating

disorder. Hamann, Wonderlich-Tierney, and Wal (2009) investigated identity and IPS

and their relationship to bulimia. Results showed that fear of negative evaluation (FNE)

was associated with the development of bulimia, even after controlling for depression.

The construct of FNE refers to apprehension about the prospect of unfavorable evaluation

(Watson & Friend, 1969). Individuals who score highly on the Fear of Negative

Evaluation Scale are more socially anxious than those with low scores on the measure

(Leary, 1983). Additionally, a fragile inner self, FNE, and idealization of thinness were

associated with the maintenance of bulimia. A fragile inner self refers to a core sense of

self in which an individual feels unlikable (Boyce and Parker, 1989); individuals feel as if

this part of themselves must remain concealed from others.

Additionally, bulimic women are more likely than noneating-disordered (NED)

women to have significant increases in self-criticism following negative social

interactions. In a study examining hypersensitivity to social interactions in bulimic

women, 104 female participants (55 actively bulimic, 18 formerly bulimic, and 31 NED women) kept daily records of social experiences that lasted 10 or more minutes for several weeks. Participants were instructed to rate interaction tone, self-perception, and mood on 5-point Likert-type scales for each interaction. Additionally, participants were asked to record eating behaviors that took place between the most recent social interaction and previous interactions. Specific behaviors to be noted included instances of binge eating, vomiting, laxative abuse, and prolonged exercising. Last, participants were asked to complete a final mood and eating record at the end of each day. As mentioned, bulimic women were more likely to rate social interactions negatively and record higher levels of self-criticism than were recovered bulimics or NED women. This suggests that bulimic women may be more sensitive to interpersonal situations. Furthermore, the results showed that episodes of binge eating often follow unpleasant social experiences, supporting the link between IPS and binge eating (Steiger, Gauvin, Jabalpurwala, Seguin, & Stotland, 1999).

Bulimic women are also more likely to report low levels of perceived social support than controls (Grissett & Norvell, 1992). Participants completed self-report measures that assessed perceived social support, quality of relationships, social skills, and psychopathology. Women with bulimia rated the quality of their relationships lower and reported a higher occurrence of negative interactions than did controls. Additionally, the participants were involved in a 5-minute videotaped role-play interaction with confederate females, where the confederates were blind to the eating disorder status of the women with whom they were interacting. The role-play involved a scenario in which the pair discussed how they might improve the living situation with a third roommate

with whom they were having conflicts. Confederates were instructed to interact the same way with each participant. The videotaped interactions were rated for effectiveness of social strategies by both male and female observers. Observers were also blind to the eating disorder status of the participants. Bulimic women were more likely to exhibit disordered styles of communication and were rated by observers as less socially competent than were controls. These deficits in social competence and communication may contribute to a lack of social support and increased levels of anxiety, and they may also exacerbate symptoms of bulimia, such as binge eating. As previously mentioned, bulimic women tend to be socially anxious; this study indicates that this social anxiety may be grounded in some reality, as bulimic women may be less socially competent than nonbulimic women are.

Another deficit in social competence related to bulimia is difficulty expressing emotions. Compared to controls, women who were diagnosed with either anorexia or bulimia were more likely to inhibit both positive and negative emotions (Forbush & Watson, 2006). Women with eating disorders displayed higher levels of hostility and neuroticism, were less aware of their feelings, and had higher levels of public self-consciousness. Even compared to women with anorexia, bulimic women reported more emotional inhibition, neuroticism, public self-consciousness, and hostility. These data indicate that individuals with difficulties recognizing and expressing emotions may learn to handle their emotions, interpersonal conflict, and hostility by engaging in maladaptive coping mechanisms such as binge eating.

Sociotropy

Sociotropy, or social dependency and need for approval (Beck, 1983), is another construct that may be linked to bulimia. Friedman and Whisman (1996) evaluated the connection between bulimic symptomatology, depression, sociotropy, and autonomy. Participants completed the Bulimia Test-Revised, the Beck Depression Inventory, and the Personal Style Inventory (a measure of sociotropy and autonomy). The results indicated that sociotropy and autonomy were related to bulimic symptomatology. However, once depressive symptoms were statistically controlled, only the link between bulimic symptoms and sociotropy remained significant. This indicates that acceptance and approval themes in cognition may be of importance in bulimia.

Similar results were found in a study comparing a clinical sample of women seeking treatment for bulimia and a nonclinical sample of undergraduate women (Hayaki, Friedman, Whisman, Delinsky, & Brownell, 2003). Participants who exhibited symptoms of bulimia scored higher on the Sociotropy and Autonomy Scale than did those without bulimic symptoms. The relationship between sociotropy and bulimic symptomatology was again found to exist independent of depression. Therefore, because there is no evidence to suggest that depression accounts for the relationship between sociotropy and binge eating, it was not anticipated that depression would play a significant role in the present analysis of IPS. Therefore, this study assessed depression as a potential confounding variable with respect to only the relationship between possible selves and depression, not IPS and depression.

Preoccupation with appearance has been clearly established as an important facet of eating disorders. It has been argued that at least for women, this stems from the

concept of the body as a "social object" (Silberstein, Striegel-Moore, & Rodin, 1987). Female bodies are evaluated by men and women alike to a much greater degree of scrutiny than male bodies typically face. Consequently, women who feel dissatisfied with their physical appearance will likely feel socially anxious.

Not only are bulimic women overly concerned with physical appearance and attractiveness, they are also preoccupied with their "social self." The connection between the social self (how others perceive an individual) and bulimia has been explored in terms of body esteem (Streigel-Moore, Silberstein, & Rodin, 1993). Participants were asked to fill out a series of measures including questionnaires assessing social anxiety, self-consciousness, and perceived fraudulence. Perceived fraudulence refers to an individual experiencing a false sense of self. The authors concluded that, in the context of bulimia, bulimic women's "concerns with fulfilling others' expectations at the expense of acknowledging their own needs prevent them from developing a stable self-definition" (Streigel-Moore, Silberstein, & Rodin, 1993, pg. 297). Women with bulimia also scored higher than controls on Public Self-Consciousness and Social Anxiety scales, indicating that their concerns related to the social self were associated with body dissatisfaction.

Though previous researchers have explored IPS and identity impairment in relation to bulimia, there is an absence of literature investigating the relationship of these variables in relation to BED. Thus, clinical inference (given the commonalities between bulimia and BED in other respects) and anecdotal observations prompted this study. Specifically, clinical observations suggest that women who experience negative social interactions seem to binge eat to manage associated negative feelings.

There are many facets of IPS, including fear of negative evaluation, self-consciousness, and sociotropy. This study assessed the construct of IPS with fear of negative evaluation and self-consciousness measures. The self-consciousness measure contains three scales that measure public self-consciousness, private self-consciousness, and social anxiety. The fear of negative evaluation measure assesses a construct similar to sociotropy or social anxiety. Using these measures allowed us to cover multiple facets of IPS in hopes of understanding which aspects are most strongly related to BED.

The Relationship of Interpersonal Sensitivity, Identity Impairment, and Binge Eating Disorder among College Women

Though vast amounts of literature exist on bulimia nervosa, more investigation is needed regarding BED and its associated features. BED confers risk for adverse consequences such as gastrointestinal problems and obesity, making it necessary to understand who may be at risk. Furthermore, there are few, if any, studies that examine IPS and identity in relation to BED. This study investigated the self-concept of college women with BED via the possible selves self-schema model. In addition, IPS (which may be a risk factor for the development of negative behaviors intended to manage anxiety, such as binge eating) was explored. This study aimed to simultaneously examine IPS and identity in hopes of gaining a better understanding of how they may increase the risk for BED both independently and in interaction. As BED is a disorder that needs further study, this study also aimed to contribute to the literature.

Hypotheses. Based on the literature reviewed above, three main hypotheses were tested:

Hypothesis 1

It was hypothesized that identity impairments (fewer possible selves, fewer positive selves, more negative selves, and a high ratio of negative to total possible selves) would be associated with BED.

Hypothesis 2

It was hypothesized that interpersonal sensitivity (fear of negative evaluation and self-consciousness) would be associated with BED.

Hypothesis 3

It was hypothesized that there would be a significant interaction effect for identity impairment and interpersonal sensitivity: Identity impairment and interpersonal sensitivity were expected to interact in their association with BED, with those who had high levels of identity impairment and high levels of interpersonal sensitivity being most likely to meet criteria for BED.

Method

Recruitment

Participants were recruited from a large Midwestern University. Students were not excluded based on race, sexual orientation, or socioeconomic status. The sample was limited to female undergraduate students because eating disorders primarily affect this population. Additionally, while prevalence rates of BED are comparable (Hudson, Hiripi, Pope, & Kessler, 2007), the reasons for binges seem to differ among men and women. Men seem to binge eat for reasons related to anger and substance abuse (Costanzo,

Musante, Friedman, Kern, & Tomlinson, 1999; Tanofsky, Wilfley, Spurrel, Welch, &

Brownell, 1997). Based on the bulimia literature, women seem to binge eat for reasons

related to interpersonal sensitivity. Additionally, data analyses were restricted to

participants between the ages of 18-24 in order to avoid variance in the types of possible

selves endorsed as a function of large differences in age.

 Participants were recruited from undergraduate psychology courses. They were

invited to complete a web-based survey examining eating behavior and self-concept. As

data collection took place online, a detailed description of the survey was provided, and

informed consent was inferred through continuation with the survey upon reading an

information page that contained all standard elements of informed consent. After reading

the consent form, students had to click the "Next" button in order to participate in the

survey. Students were eligible to receive extra credit in their psychology course from

their professors or laboratory instructors for their participation in the survey.

Procedure

 The present study used data collected through a web-based survey created and

distributed through Survey Monkey (www.surveymonkey.com). Recruitment was a joint

effort among a research team. The principal investigator contacted psychology instructors

and asked for their assistance in recruiting participants. With the approval of instructors,

members of the research team (including the principal investigator) visited psychology

courses to briefly explain the study. A script was used to ensure consistency across

recruiters. The script read as follows:

> We are looking for volunteers to complete a survey about eating habits and self-
> concept. Taking part in this survey will help us better understand how students'
> self-concept may be related to specific behaviors associated with eating habits.
> The survey will take about 30 minutes to complete. If your instructor is offering

extra credit for research participation, we will provide him/her with a list of names of those who complete the survey, and the extra credit will be awarded according to your course policies.

Students who were interested in participating in the study provided their email address on a sign-up sheet. Instructors also had the option to recite the script and pass out the sign-up sheet themselves, and return it to the research team. A link to the survey was sent to each email address by a member of the research team.

Alternatively, students in psychology laboratories could access the survey through the online SONA system, which automates the record-keeping process for students who participate in research. Instructors can access the site to determine which students have participated in the study, but they cannot access the students' data.

Participants were able to exit the survey at any point (without penalty) if they wished to no longer participate. Though there were no anticipated risks in the present study, the nature of the questions may have caused participants minimal psychological or emotional harm. These risks were addressed in the informed consent page (see Appendix A).

Participants completed the survey in one session, and they could do so from any computer with internet access. All participants received the same questionnaires in the same order. The psychometric properties of these measures are described in more detail below. With respect to the order of administration, however, demographic information including race, sexual orientation, socioeconomic status, and marital status were collected first. The identity questionnaire followed, as it was one of the primary interests of the study. Identity was measured using the Possible Selves Questionnaire (Markus & Wurf, 1987), which assesses cognitive representations of stable goals, aspirations, motives,

fears, and threats, and whether they are positive or negative. The next questionnaire assessed depression, as it may be a confounding variable to the number of possible selves participants endorse. The next questionnaire assessed eating and weight control behaviors. This was used to assess BED and rule out bulimia. The interpersonal sensitivity (specifically, fear of negative evaluation and self-consciousness) measures were last. Completion of the survey took approximately 30 minutes.

For students who were emailed a link to the survey, the last page of the survey contained a link to a separate web page where students could provide their identification number and professor's name in order to receive extra credit in their psychology course. This kept the student's identification information separate from their data. The principal investigator provided this information to instructors, who awarded extra credit in accordance with their course policies.

Measures

Demographic Information. A demographic questionnaire was administered assessing age, height, weight, race/ethnicity, number of years of education completed, marital status, sexual orientation, employment status, family economic status, and family income (see Appendix B).

Possible Selves Questionnaire (PSQ). The PSQ (Markus & Wurf, 1987), also referred to as the closed-ended PSQ, consists of 32 items designed to assess future fears, goals, desires, and ambitions. The items are adjectives derived from six main categories: general descriptions of the self, physical descriptions of the self, lifestyle and events, personal abilities, occupational interests, and descriptions based on others' opinions. This questionnaire was used in this study as a measure of self-concept. Participants were

asked, "How much do you think that this *will* describe you in the future?" Items are
scored on a Likert-type scale (1 = *not at all*, 4 = *somewhat*, 7 = *very much*). There are no
reverse-scored items. Scores can range from 32 to 224. Half of the 32 adjectives are
positive and the other half are negative. High scores on the positive adjectives reflect a
high number of positive possible selves. High scores on the negative adjectives reflect a
high number of negative possible selves. Scores have been shown to be stable over a one-
week test-retest interval (positive possible selves $r = .72$, negative possible selves $r = .89$;
see Appendix C). The first identity variable was operationally defined as how many total
possible selves participants endorsed (using a cutoff score of five or above), with a
maximum of 32. The second and third identity variables were developed by calculating
the number of positive and negative possible selves, with a maximum of 16 for each. The
fourth identity variable consisted of the ratio of negative to total possible selves.

Patient Health Questionnaire (PHQ-9). The PHQ-9 (Kroenke, Spitzer, &
Williams, 2001) is a 9-item section of the Primary Care Evaluation of Mental Disorders
Patient Health Questionnaire (PRIME-MD; Spitzer et al., 1994) that screens for a
probable depression diagnosis and assesses symptom severity. Respondents were asked,
"Over the last 2 weeks, how often have you been bothered by any of the following?" An
example item is "little interest or pleasure in doing things." Items are scored on a Likert-
type scale (0 = *Not all*, 1 = *several days*, 2 = *more than half the days*, 3 = *nearly every
day*). There are no reverse scored items. Scores can range from 0 to 27, with higher
scores reflecting higher levels of depression (scores ranging from 5 to 9 indicate mild
depression, 10 to 14 indicate moderate depression, 15 to19 indicate moderately severe
depression, and 20 to 27 indicate severe depression). According to Kroenke, Spitzer, and

Williams (2001), the internal reliability was found to be high (primary care sample, α =

.89, obstetrics-gynecology sample, α = .84). Scores were stable over a 48-hour test-retest

interval (r = .84). Martin, Rief, Klaiberg, and Braehler (2006) found that in a sample of

the general population, responses to the Brief Beck Depression Inventory (Brief-BDI;

Schmitt, & Maes, 2000) correlated highly with responses to the PHQ-9 (r = .73). Factor

analysis supported a one-factor solution, which explained 42% of the variance (Cameron,

2008; see Appendix D).

   Questionnaire on Eating and Weight Patterns Revised (QEWP-R). The

QEWP-R (Spitzer, Yanovski, & Marcus, 1994) is a 28-item measure that assesses eating

disorders based on DSM-IV criteria, along with dieting history and weight control

behaviors. The QEWP-R was used in this study to assess BED symptoms and rule out

bulimia. The QEWP-R is composed of four scales, used for diagnosing BED, diagnosing

non-purging and purging bulimia, and judging the amount of food described as being

unusually large for the circumstances. This study focused on scores on the BED scale,

which consists of six items. The following scoring algorithm is used to diagnose BED. To

meet the criteria for BED, respondents must endorse item #10 ("During the past six

months, did you often eat within any two hour period what most people regard as an

unusually large amount of food?") and #11 ("During the times you ate this way, did you

feel you couldn't stop eating or control what or how much you were eating?"). Item 12

reads: "During the past six months, how often, on average, did you have times when you

ate this way - that is, large amounts of food plus the feeling that your eating was out of

control? There may have been some weeks when it was not present - just average those

in." This item is scored on the following scale: 1 = *less than one day a week*, 2 = *one day*

a week, 3 = *two or three days a week*, 4 = *four or five days a week*, or 5 = *nearly every day*. Cutoff scores of three or more were used for this question, in accordance with DSM-IV criteria. Item 13 reads: "Did you usually have any of the following experiences during these occasions?" Response choices are scored dichotomously and a cutoff of three or more items endorsed was used. Item 15 reads: "In general, during the past six months, how upset were you by overeating (eating more than you think is best for you)?" Response choices include 1 = *not at all*, 2 = *slightly*, 3 = *moderately*, 4 = *greatly*, or 5 = *extremely.* Item 16 reads: "In general, during the past six months, how upset were you by the feeling that you couldn't stop eating or control how much you were eating?" Response choices and cutoff is the same as item 15. Bulimia was ruled out by the absence of overvaluation of weight/shape and a lack of compensatory behaviors, as evidenced by scores on the purging and non-purging bulimia scales.

In this investigation, binge eating was conceptualized in three ways: binge eating was considered a *behavior*, a *symptom*, and an eating *disorder* (meeting full BED criteria). Binge eating behavior (BE Beh) was a dichotomous variable derived from a single item from the QEWP-R ("During the past six months, did you often eat within any two hour period what most people regard as an unusually large amount of food?"). Binge eating symptom (BE Sx) was a variable derived from participants endorsing BE Beh and indicating a loss of control while engaging in overeating ("During the times you ate this way, did you feel you couldn't stop eating or control what or how much you were eating?"). Full BED criteria were assessed for using the aforementioned QEWP-R algorithm.

Spitzer et al. (1993) found inter-item agreement to be good (weight control

sample, α = .75, community sample, α = .79). BED scores have been found to be stable

over a test-retest period of three weeks within a sample of self-referred binge eaters (*k* =

.57; Nangle, Johnson, Carr-Nangle, & Engler, 1994). The QEWP-R has been found to

have a sensitivity of .74 and a specificity of .35, while the Binge Eating Scale (BES;

Gormally, Black, Daston, & Rardin, 1982) had a higher sensitivity (.85) but a lower

specificity (.20; Celio, Wilfley, Crow, Mitchell, & Walsh, 2004). Agreement between the

QEWP-R and clinical judgment has been found to be good (*k* = .60; Spitzer et al., 1993).

Celio et al. (2004) found the convergent validity between the QEWP-R and the Eating

Disorder Examination Questionnaire (EDE-Q; Goldfein et al., 2002) to be good

(Kendall's tau *b* = .53; see Appendix E).

Brief Version of the Fear of Negative Evaluation Scale (Brief-FNE). In this

study, the Brief-FNE was one measure of interpersonal sensitivity. It is not well

understood which aspects of IPS are most strongly associated with BED, so the present

study took a muli-method approach, for exploratory purposes. The original FNE Scale

was a 30-item scale developed by Watson and Friend (1969) to assess social-evaluative

anxiety. Leary (1983) selected twelve items from the FNE Scale that correlated at least

.50 with the scale total. Additionally, the response format was altered from true-false to a

Likert-type scale (1 = *Not at all characteristic of me*, 3 = *Moderately characteristic of

me*, 5 = *Extremely characteristic of me*). Items 2, 4, 7, and 10 are reverse scored. Scores

can range from 12 to 60, with higher scores reflecting higher levels of fear of negative

evaluation. The Brief-FNE correlates highly with the original FNE (*r* = .96). The inter-

item reliability of the full length FNE was quite high (α = .92). For the Brief-FNE, inter-

item reliability was also quite high (α = .90). Scores were fairly stable across a four-week test-retest interval (*r* = .68 for the full FNE, .75 for the Brief-FNE). Collins, Westra, Dozois, and Stewart (2005) found that the Brief-FNE correlated moderately (*r* = .56) with the Fear Questionnaire Social Phobia subscale (FQ-S; Marks, & Mathews, 1979) in a sample of participants who had either social phobia or panic disorder. Using a sample of participants with Social Anxiety Disorder, Weeks et al. (2005) observed that the Brief-FNE moderately correlated (*r* = .56) with The Liebowitz Social Anxiety Scale (Liebowitz, 1987). Discriminant validity was supported by low correlations with unrelated constructs (education *r* = .05, age *r* = -.11). Confirmatory factor analysis supported a two-factor solution, which consisted of positive and reverse scored items (Duke, Krishnan, Faith, & Storch, 2006). However, this appears to more accurately reflect method variance, rather than two distinct constructs (see Appendix F).

Self-Consciousness Scale (SCS). The Self-Consciousness Scale (Fenigstein, Scheier, & Buss, 1975; see Appendix G) is a 23-item measure designed to assess individual differences in self-consciousness. This measure was used as the second measure of interpersonal sensitivity in this study. Factor analysis revealed that self-consciousness has three elements, which led to the three subscales, labeled Private Self-Consciousness (a 10-item scale which measures the degree to which one attends to inner thoughts and feelings), Public Self-Consciousness (a 7-item scale which measures general awareness of the self as a social object), and Social Anxiety (a 6-item scale which measures discomfort in the presence of others). Responses are measured on a Likert-type scale (0 = *extremely uncharacteristic*, 4 = *extremely characteristic*). Items 3, 9, and 12 are reverse scored. Scores can range from 0 to 92, with higher scores reflecting higher

levels of self-consciousness and social anxiety. All items loaded above .40 with their associated scale (Fenigstein, Scheier, & Buss, 1975). Scores were stable over a 2-week test-retest interval (total score $r = .80$, public self-consciousness .84, private self-consciousness .79, and social anxiety .73). Turner, Scheier, Carver, and Ickes (1978) established convergent validity for each subscale using samples of college students. The Guilford-Zimmerman Thoughtfulness Scale (Guilford, & Zimmerman, 1949) correlated significantly with private self-consciousness ($r = .48$). The public self-consciousness scale correlated significantly with the Morse and Gergen (1970) Self-esteem Scale ($r = -.26$). The social anxiety scale correlated significantly with emotionality scores, as measured using Buss and Plomin's (1975) EASI III Temperament Survey (r = .31). Using a sample of male undergraduates, Carver and Glass (1976) established discriminant validity between the SCS and the Edwards Personal Preference Schedule, a need for achievement measure (EPPS; Edwards, 1959; private self-consciousness $r = .16$, public self-consciousness $r = .09$, social anxiety $r = .07$, total SCS, $r = .07$).

In Table 1, the number of items on the aforementioned measures, along with reliability statistics, has been compiled.

Table 1

Number of items and reliability of included measures

	Number of items	Reliability
Self-consciousness Scale	23	$r = .80$
Private	10	$r = .79$
Public	7	$r = .84$
Social Anxiety	6	$r = .73$
Fear of Negative Evaluation	12	$\alpha = .90$
Total Possible Selves	32	
Positive Possible Selves	16	$r = .72$
Negative Possible Selves	16	$r = .89$
Questionnaire on Eating Weight		
Patterns Revised	28	$\alpha = .75$
Patient Health Questionnaire-9	10	$\alpha = .89$

α = Cronbach's Alpha r = test-retest reliability coefficient

Design

      This study used a single-session cross sectional design. The goal was to investigate the prevalence of BED and the relationships between binge eating, interpersonal sensitivity, and identity impairment. A control group of participants who did not binge eat was compared with participants who did, to assess if individuals who binge eat have higher levels of FNE and SCS, a lower total number of possible selves, fewer positive possible selves, more negative possible selves, and a higher ratio of negative to total possible selves.

Data Analyses

      Data were analyzed using SPSS version 17.0 statistical software. After data were collected, they were cleaned by searching for outlying values (for example, misentered values for height, education) which were recoded as missing data. Prior to hypothesis testing, minimal missing data were interpolated using mean substitution (if one to three items were missing from a scale).

      Independent Variables. There were two main constructs of interest in this study: identity impairment and interpersonal sensitivity. The first set of independent variables included four identity variables, derived from the theory of possible selves. The first identity variable was operationally defined as how many total possible selves participants endorsed (using a cutoff score of five or above on a 7-point Likert-type scale), with a maximum of 32 possible selves. The second and third identity variables were

operationalized by calculating the number of positive and negative possible selves, with a maximum of 16 for each. The fourth identity variable consisted of the ratio of negative to total possible selves.

The second set of independent variables reflected dimensions of interpersonal sensitivity. These were continuous variables, operationally defined as higher scores on self-consciousness and fear of negative evaluation measures.

Dependent Variable. The dependent variable in this study was binge eating. This was assessed using the QEWP-R algorithm that classifies participants as binge eaters and non-binge eaters. As explained above in more detail, binge eating was conceptualized in three ways: binge eating was considered a *behavior*, a *symptom*, and an eating *disorder* (meeting full BED criteria). It was necessary to explore subthreshold BED (i.e., behavior and symptom variables) due to a lack of statistical power for the BED group. Therefore, BE Sx acted as the dependent variable in the logistic regression analysis, with identity impairment, IPS, and their interaction term serving as predictors, and BMI and depression scores serving as covariates.

Covariates. After testing the main variables of interest, follow-up regressions were conducted while controlling for BMI and depression. The purpose of these analyses was to test if the relationship between binge eating and our variables of interest still existed when controlling for BMI and depression. BMI was controlled because individuals who binge eat and are overweight may differ from those who binge eat and are not overweight. Depression was controlled because depressed individuals are more likely to endorse fewer total possible selves, fewer positive possible selves, and more

negative possible selves than are non-depressed individuals (e.g., Penland, Masten, Zelhart, Fournet, & Callahan, 2000).

Hypothesis Testing. Two correlation matrices were computed. One examined correlation coefficients for psychological and physical predictors of BE behavior, BE symptom, and BED among college women. The other examined correlation coefficients for the self-consciousness subscale predictors of BE behavior, BE symptom, and BED among college women.

Several independent *t*-tests were conducted to test if groups (BE Beh vs. no BE Beh, BE Sx vs. no BE Sx, and BED vs. no BED) differed on the variables of interest (IPS and identity impairment).

Follow-up one-way analyses of variances (ANOVAs) were conducted to place each participant into one binge eating level and eliminate group overlap. In the *t*-tests, for example, if an individual met full BED criteria, she was also placed into the binge eating symptom and binge eating behavior groups, making the results less clean. A post-hoc Tukey's test was also run for each ANOVA into order to detect group differences. A Bonferonni correction was used to address the issue of multiple comparisons.

Results

Participants

Participants were female undergraduate students at a Midwestern university. A total of 470 psychology students participated in the survey. However, due to the present study's inclusion criteria, only female students falling into the age range of eighteen to twenty-four years old (n = 313) were included. After accounting for duplicates across semesters and incomplete data (two students participated more than once and 16 students

provided incomplete data), valid data were available for 295 women between the ages of eighteen and twenty-four. The duplicate surveys were identified using the identification numbers participants provided. Surveys were considered incomplete if binge eating status was impossible to calculate or substantial data were missing for needed analyses. Therefore, of the original sample, only 295 participants with valid data met the inclusion criteria for the analyses presented here. Participants were predominantly Caucasian (74.6%) and, by design, their ages ranged from 18-24 years old. The average age was 19.90 (SD ± 1.79) and the average BMI was 25.35 (SD ± 5.72). The demographic variables are summarized in Table 2. Binge eating behavior was endorsed by 27.5% of participants. Binge eating symptom was endorsed by 10.5% of participants. Full BED criteria were met by 2.4% of participants. Table 2 also presents the means and SDs for the different eating groups for depression and BMI. Not surprisingly, participants who met full criteria for BED reported higher levels of depression and had a higher BMI than did participants who endorsed BE behavior and symptom.

Table 2

Participant characteristics[a]

Demographic variables	Participants (n=295)[b]
Race (% White)	220 (74.6%)
Age	19.90 ± 1.79
Education (yrs)	13.71 ± 1.59
Depression	
Full Sample	5.19 ± 5.01
No BE	4.64 ± 4.76
BE Beh	6.63 ± 5.38
BE Sx	8.29 ± 5.97
BED	9.57 ± 5.26
BMI	
Full Sample	25.35 ± 5.72
No BE	25.00 ± 5.40
BE Beh	26.30 ± 6.44
BE Sx	28.25 ± 7.16
BED	28.89 ± 4.56

Marital status

    Single, divorced, or separated   254 (86.1%)

    Married or living with partner   38 (12.9%)

Employment status

    Employed at least part time   181 (61.4%)

Economic status

    Barely enough to get by   19 (6.4%)

    Enough, but no more   78 (26.4%)

    Solidly middle class   135 (45.8%)

    Plenty of extras   36 (12.2%)

    Luxuries   8 (2.7%)

Annual household income

    > $150,000   13 (4.4%)

    100-149,000   27 (9.1%)

    75-99,000   26 (8.8%)

    50-74,000   30 (10.1%)

    25-49,000   34 (11.4%)

    10-24,000   34 (11.8%)

    < 9,000   20 (7.1%)

[a]Values are expressed as n (%) or $M \pm SD$.

[b]N=295 except for marital status (n=292), education (n=290), economic status (n=276), and household income (n=184).

The correlation coefficients for psychological and physical predictors of BE behavior, BE symptom, and BED among college women are presented in Table 3. As can be seen on this table, depression, fear of negative evaluation, and self-consciousness are all positively related to BE Behavior, BE Symptom, and BED. The Negative Possible Selves variable is significantly related to both BE Behavior and BE Symptom, but only BE Symptom is related to the ratio of negative possible selves to total possible selves. More discussion of these results is presented below.

Table 3

Correlation coefficients for psychological and physical predictors of BE behavior, BE symptom, and BED among college women

	BE Beh	BE Sx	BED	1	2	3	4	5	6	7	8
1. BMI[a]	0.10	**0.17***	0.10	--							
2. Depression[a]	**0.18***	**0.21***	**0.14**	**0.10**	--						
3. FNE	**0.18***	**0.21***	**0.21***	**0.08**	**0.39***	--					
4. SCS	**0.17***	**0.20***	**0.20***	0.07	**0.42***	**0.65***	--				
5. Total PS	0.01	-0.00	-0.05	**0.17***	-0.08	-0.10	-0.06	--			
6. Pos PS	-0.05	-0.09	-0.08	**-0.14**	**-0.23***	**-0.16***	-0.10	**0.90***	--		
7. Neg PS	**0.14**	**0.18***	0.08	0.04	**0.33***	**0.12**	0.10	**0.15***	**-0.31***	--	
8. Neg/Tot PS	0.10	**0.16***	0.10	0.02	**0.36***	**0.17***	0.13	-0.12	**-0.53***	**0.91***	--

Note. $N = 295$. **$p < .05$, *$p < .01$.** [a]covariate

Table 4

Means and standard deviations of variables of interest

	Mean	Standard Deviation
Self-consciousness		
Overall sample	57.75	12.77
Non-bingers	50.46	12.23
BE Beh	55.16	13.09
BE Sx	59.29	11.14
BED	68.14	12.16
Fear of Negative Evaluation		
Overall sample	35.32	9.75
Non-bingers	34.28	9.44
BE Beh	38.09	10.08
BE Sx	41.26	10.92
BED	48.42	12.18
Total Possible Selves		
Overall sample	11.39	2.83
Non-bingers	11.36	2.80
BE Beh	11.44	2.92
BE Sx	11.32	2.83
BED	10.57	2.26
Positive Possible Selves		
Overall sample	10.39	2.94
Non-bingers	10.48	2.91
BE Beh	10.15	3.03

BE Sx	9.61	2.99
BED	8.86	3.85
Negative Possible Selves		
Overall sample	1.00	1.36
Non-bingers	0.88	1.15
BE Beh	1.30	1.76
BE Sx	1.71	2.12
BED	1.71	2.36
Negative/Total Possible Selves		
Overall sample	0.10	0.13
Non-bingers	0.08	0.12
BE Beh	0.11	0.14
BE Sx	0.15	0.17
BED		
Body Mass Index		
Overall sample	25.35	5.72
Non-bingers	25.00	5.40
BE Beh	26.30	6.44
BE Sx	28.25	7.16
BED	28.89	4.56
Depression		
Overall sample	5.19	5.00
Non-bingers	4.64	4.76
BE Beh	6.63	5.38
BE Sx	8.29	5.97

BED	9.57	5.26

Hypothesis 1a: Women who Binge Eat Will Endorse Fewer Total Possible Selves

First, three *t*-tests were conducted to evaluate if women who binge eat endorse a lower number of total possible selves than do women who do not binge eat. Contrary to our hypothesis, women who engaged in binge eating behavior did not endorse significantly higher numbers of total possible selves than women who did not engage in binge eating behavior, $t(293) = -.216$, $p = .83$. Women who endorsed binge eating symptom also did not endorse significantly higher numbers of total possible selves than those who did not report binge eating symptom, $t(293) = .133$, $p = .90$. Women with BED also did not endorse significantly higher numbers of total possible selves than those without BED, $t(293) = .771$, $p = .44$.

A follow-up one-way ANOVA was conducted, in which each participant was placed into one binge eating level, in order to eliminate group overlap. Syntax was created in which the highest level of binge eating severity endorsed by each participant determined which binge eating level they were placed into. Results are depicted in Figure 1. A Tukey post-hoc test was conducted to detect group differences, which revealed that there were no significant differences between groups.

Figure 1. Total possible selves across binge eating levels

Note. N = 295. No BE n = 214, BE Beh n= 50, BE Sx n = 24, BED n = 7. *F* (3, 291) = 0.257, *p* =.856, η^2 = .003.

Hypothesis 1b: Women who Binge Eat Will Endorse Fewer Positive Possible Selves

Next, three *t*-tests were conducted to evaluate if women who binge eat endorse a lower number of positive possible selves than do women who do not binge eat. Contrary to our hypothesis, women who engaged in binge eating behavior did not endorse significantly higher numbers of positive possible selves than those who did not engage in binge eating behavior, *t* (293) = .867, *p* = .39. Women who reported binge eating symptom did not endorse significantly higher numbers of positive possible selves than those who did not report binge eating symptom, *t* (293) = 1.557, *p* = .12. Women who met BED criteria did not endorse significantly higher numbers of positive possible selves than those who did not meet BED criteria, *t* (293) = 1.396, *p* = .16.

A follow-up one-way ANOVA was conducted, in which each participant was placed into one binge eating level, in order to eliminate group overlap. Follow-up analyses are depicted in Figure 2. A Tukey post-hoc test was conducted to detect group differences, which revealed that there were no significant differences between groups.
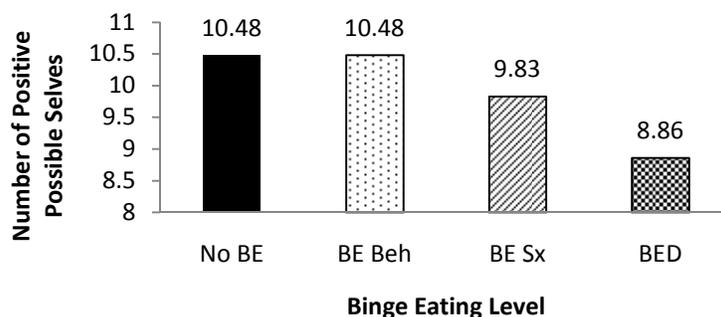
Figure 2. Positive possible selves across binge eating level

Note. $N = 295$. No BE n = 214, BE Beh n= 50, BE Sx n = 24, BED n = 7. $F(3, 291) = 1.003$, $p = .392$, $\eta^2 = .010$.

Hypothesis 1c: Women who Binge Eat Will Endorse More Negative Possible Selves

Next, three *t*-tests were conducted to evaluate if women who binge eat endorse a higher number of negative possible selves than do women who do not binge eat. Though women who engaged in binge eating behavior did not endorse significantly higher numbers of negative possible selves than those who did not engage in binge eating behavior, there was a very strong trend, $t(293) = -1.962$, $p = .052$. Women who reported BED symptoms endorsed significantly more negative possible selves than did those who did not report binge eating symptoms, $t(293) = -2.057$, $p < .01$. Women who met BED criteria did not endorse significantly higher numbers of negative possible selves than those who did not meet BED criteria, $t(293) = -0.821$, $p = .44$. Results are depicted in Figure 3.
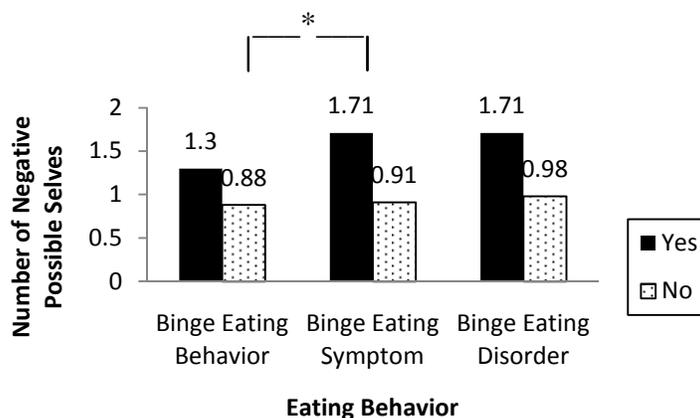
Figure 3: Negative possible selves across eating behavior

Note. $N = 295$

A follow-up one-way ANOVA was conducted, in which each participant was placed into one binge eating level, in order to eliminate group overlap. A Tukey post-hoc test was conducted to detect group differences. Results showed that participants who reported binge eating symptom

endorsed significantly higher numbers of negative possible selves than non-binge eaters, $p < .05$.

This was the only significant group difference found in the analyses. Results are depicted in

Figure 4.
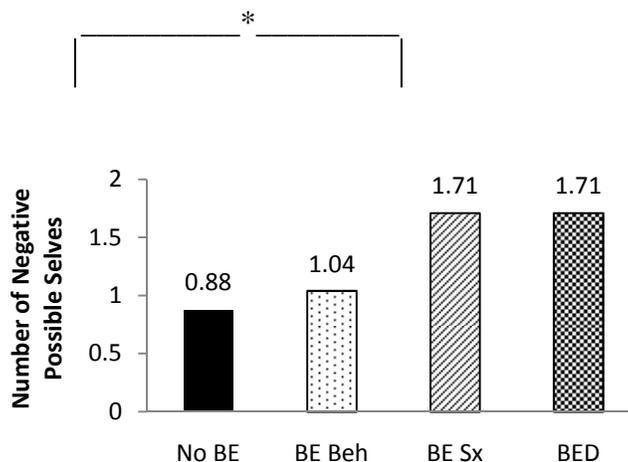
Figure 4: Negative possible selves across binge eating level

Note. $N = 295$. No BE n = 214, BE Beh n= 50, BE Sx n = 24, BED n = 7. $F (3, 291) = 3.456$, $p <$

$.05$, $\eta^2 = .034$.

Table 5 presents the specific Negative Possible Selves items endorsed by each group. Chi

square analyses were conducted across the four groups for whether or not they endorsed a

Negative Possible Self Item. As can be seen, the BED group endorsed poor health, alone,

unwanted, and drug/alcohol dependent significantly more often than did the other three groups.

Table 5

Percentage of Women who endorsed each Negative Possible Self by Binge Eating Level

Possible Self	No Be	Be Beh	Be Sx	BED
Nursing home	4%	6%	4%	29%
Ordinary	28%	26%	26%	43%
Breakdown	12%	12%	35%	43%
Poor health*	5%	0%	9%	14%
Unemployed	4%	4%	9%	14%
Alone*	4%	4%	17%	43%
Street person	3%	4%	4%	14%
Unwanted*	.04%	2%	9%	14%
On welfare	1%	6%	4%	14%
Divorced	.04%	2%	4%	14%
Disabled	1%	2%	0%	14%
Depressed	6%	10%	17%	43%
Abuser	2%	0%	4%	14%
Bored	12%	14%	22%	29%
Not in control of life	4%	6%	0%	29%
Drug/alcohol dependent*	.04%	2%	0%	14%

* = Chi-square significant at the .01 level

Hypothesis 1d: Women who Binge Eat Will Have Higher Ratios of Negative Possible Selves to Total Possible Selves

Next, three *t*-tests were conducted to evaluate if women who binge eat have higher ratios of negative possible selves to total possible selves than do women who do not binge eat. Women who engaged in binge eating behavior did not endorse significantly higher ratios of negative to total possible selves than those who did not engage in binge eating behavior, $t(293) = -1.651$, $p = .10$. Women who reported binge eating symptom endorsed a higher ratio of negative possible selves to total possible selves than did those who did not report binge eating symptom, $t(293) = -2.136$, $p < .05$. Women who met BED criteria did not endorse significantly higher ratios of negative to total possible selves than those who did not meet BED criteria, $t(293) = -1.072$, $p = .32$. Results are shown in Figure 5.
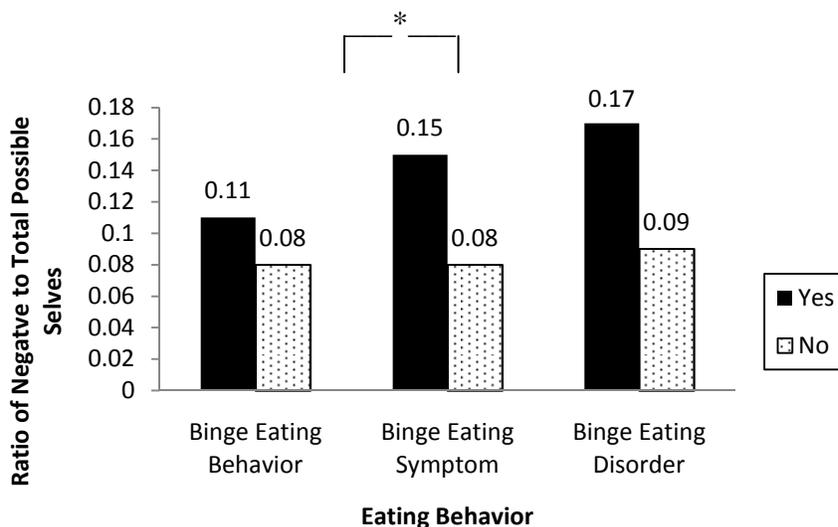

Figure 5: Ratio of negative to total possible selves across eating behavior

Note. N = 295.

A follow-up one-way ANOVA was conducted, in which each participant was placed into one binge eating level, in order to eliminate group overlap. A Tukey post-hoc test was conducted

to detect group differences, which revealed that there were no significant differences among binge eating levels in the ratio of negative to total possible selves, once each participant was placed into only one group. However, there was an overall trend towards significance for the overall ANOVA. Results are depicted in Figure 6.
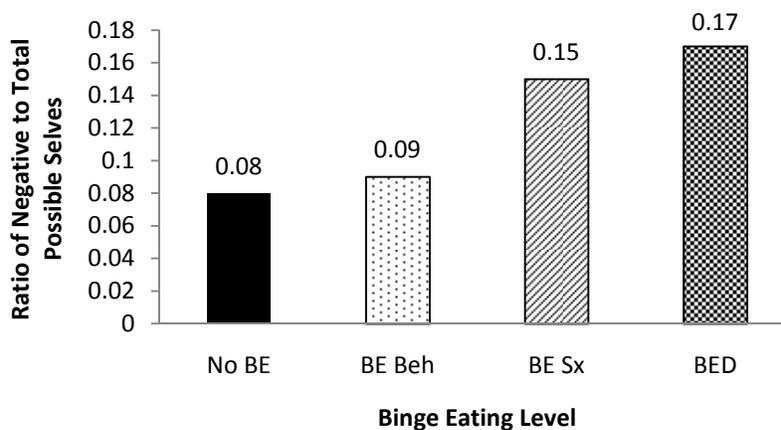
Figure 6: Ratio of negative to total possible selves across binge eating level

Note. N = 295. No BE n = 214, BE Beh n= 50, BE Sx n = 24, BED n = 7. *F* (3, 291) = 2.602, *p* = .052, η^2 = .026.

Hypothesis 2a: Women who Binge Eat Will have Higher levels of Fear of Negative Evaluation

Next, three *t*-tests were conducted to evaluate if women who binge eat have higher levels of fear of negative evaluation than do women who do not binge eat. Women who engaged in binge eating behavior endorsed significantly higher levels of fear of negative evaluation than did those who did not engage in binge eating behavior, *t* (293) = -3.036, *p* < .01. Women who endorsed binge eating symptom also endorsed significantly higher levels of fear of negative evaluation than did those who did not endorse binge eating symptom, *t* (293) = -3.656, *p* < .001. In addition, women who met BED criteria endorsed significantly higher levels of fear of negative evaluation than did those without BED, *t* (293) = -3.674, *p* < .001. Results are shown in Figure 7.

Figure 7: Fear of negative evaluation across eating behavior

Note. N = 295

A follow-up one-way ANOVA was conducted, in which each participant was placed into one binge eating level, in order to eliminate group overlap. A Tukey post-hoc test was conducted to detect group differences. This analysis showed women who met full BED criteria endorsed significantly higher levels of fear of negative evaluation than those who did not binge eat, *p* < .01. Women who met full BED criteria also endorsed significantly higher levels of fear of negative evaluation than those who endorsed binge eating behavior, *p* < .01. Results are depicted in Figure 8.
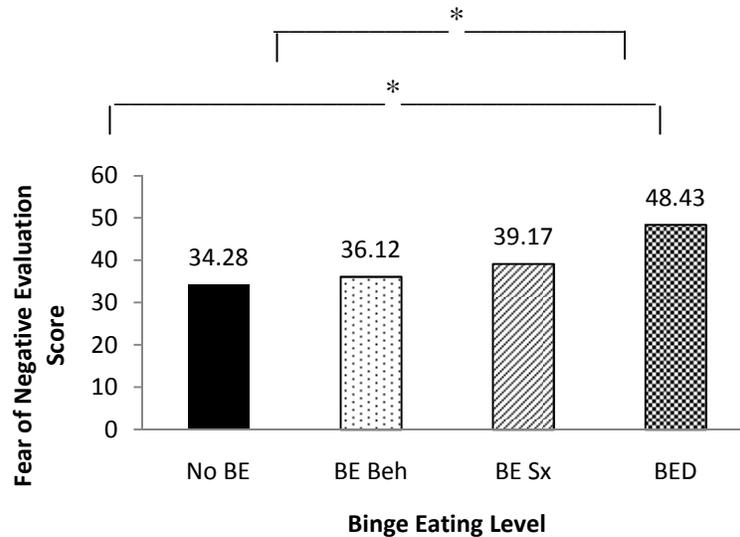
Figure 8: Fear of negative evaluation across binge eating level

Note. $N = 295$. No BE n = 214, BE Beh n= 50, BE Sx n = 24, BED n = 7. $F (3, 291) = 6.764$, p < .001, $\eta^2 = .065$.

Hypothesis 2b: Women who Binge Eat Will Have Higher Levels of Self-consciousness

Next, three *t*-tests were conducted to evaluate whether women who binge eat have higher levels of self-consciousness then do women who do not binge eat. Women who engaged in binge eating behavior endorsed significantly higher levels of self-consciousness than did those who did not engage in binge eating behavior, $t (293) = -2.858$, $p < .01$. Women who endorsed binge eating symptom also endorsed significantly higher levels of self-consciousness than did those who did not endorse binge eating symptom, $t (293) = -3.544$, $p < .001$. In addition, women who met full BED criteria endorsed significantly higher levels of self-consciousness than did those without BED, $t (293) = -3.504$, $p < .01$. Results are shown in Figure 9.
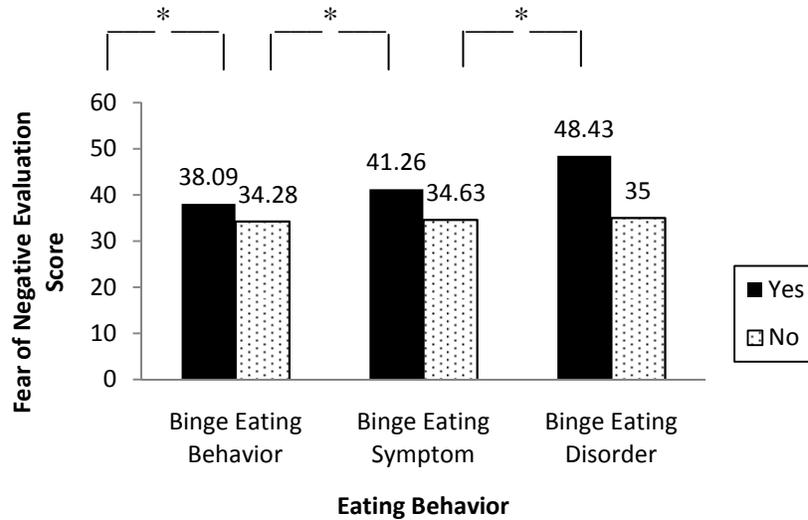
Figure 9: Self-consciousness across eating behavior

Note. N = 295

A follow-up one-way ANOVA was conducted, in which each participant was placed into one binge eating level, in order to eliminate group overlap. A Tukey post-hoc test was conducted to detect group differences. Women who met full BED criteria endorsed significantly higher levels of self-consciousness than who did not binge eat, *p* = .001. Women who met full BED criteria also endorsed significantly higher levels of self-consciousness than those who engaged in binge eating behavior, *p* < .05. Follow-up analyses are depicted in Figure 10.

Figure 10: Self-consciousness across binge eating level

Note. N = 295. No BE n = 214, BE Beh n= 50, BE Sx n = 24, BED n = 7. *F* (3, 291) = 6.166, *p* < .001, η^2 = .060.

A second set of follow-up analyses explored the three self-consciousness subscales (public self-consciousness, private self-consciousness, and social anxiety) separately across eating behavior. Women who engaged in binge eating behavior endorsed significantly higher levels of private self-consciousness than did women who did not binge eat, *t* (293) = -2.549, *p* < .05. Women who endorsed binge eating symptom also endorsed significantly higher levels of private self-consciousness than did those who did not endorse binge eating symptom, *t* (293) = -2.302, *p* < .05. In addition, women who met full BED criteria endorsed significantly higher levels of private self-consciousness than those who without BED, *t* (293) = -2.631, *p* < .01. Results are shown in Figure 11.
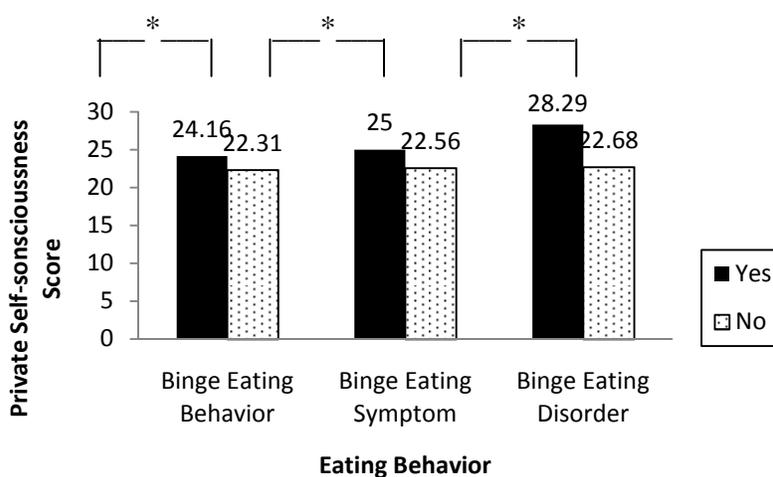
Figure 11: Private self-consciousness across eating behavior

Note. N = 295.

Women who engaged in binge eating behavior endorsed significantly higher levels of public self-consciousness than did women who did not engage in binge eating behavior, *t* (293) =

-2.549, $p < .05$. Women who endorsed binge eating symptom also endorsed significantly higher levels of public self-consciousness than did those who did not endorse binge eating symptom, t (293) = -3.584, $p < .001$. In addition, women who met full BED criteria endorsed significantly higher levels of public self-consciousness than did those who without BED, t (293) = -2.697, $p < .01$. Results are show in Figure 12.
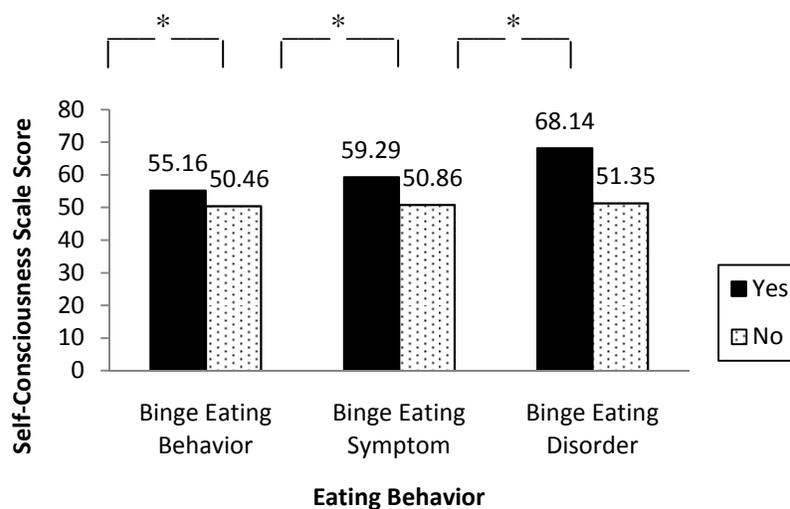

Figure 12: Public self-consciousness across eating behavior

Note. N = 295.

Women who engaged in binge eating behavior did not endorse significantly higher levels of social anxiety than did women who do not binge eat, t (293) = -1.769, $p = 08$. However, women who endorsed binge eating symptom endorsed significantly higher levels of social anxiety than did those who did not endorse binge eating symptom, t (293) = -2.643, $p < .01$. In addition, women who met full BED criteria endorsed significantly higher levels of social anxiety than did those without BED, t (293) = -2.994, $p < .01$. Results are shown in Figure 13.

Figure 13: Social anxiety across eating behavior

Note. N = 295.

A final follow-up one-way ANOVA was conducted for the three self-consciousness subscales, in which each participant was placed into one binge eating level, in order to eliminate group overlap. Tukey's test was used to determine which groups differed. Women who met full BED criteria endorsed significantly higher levels of private self-consciousness than those who did not binge eat and those who endorsed being eating behavior, *p* < .01. Similarly, women who met full BED criteria endorsed significantly higher levels of private self-consciousness than those who do not binge eat, *p* < .05. Results are depicted in Figure 14.
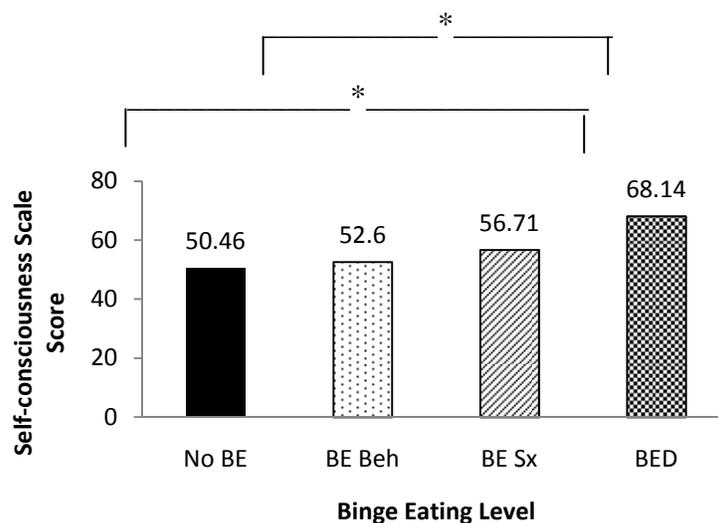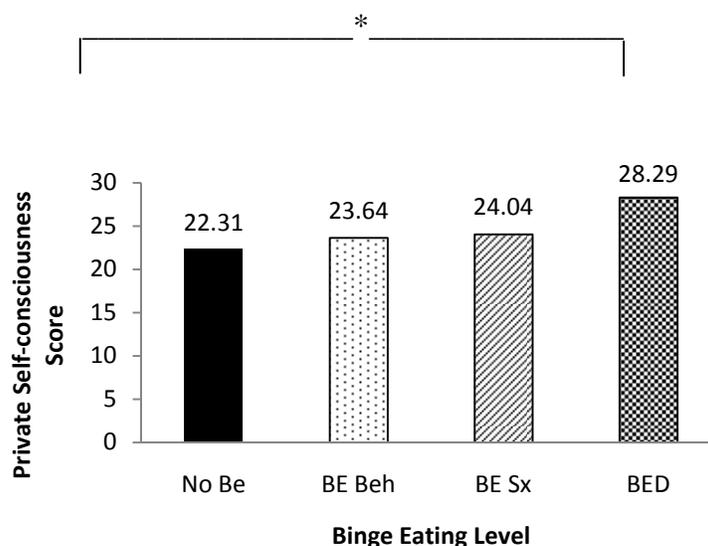
Figure 14: Private self-consciousness across binge eating level

Note. N = 295. No BE n = 214, BE Beh n= 50, BE Sx n = 24, BED n = 7. *F* (3, 291) =

3.624, *p* < .05, η^2 = .036.

Women who met full BED criteria endorsed significantly higher levels of public self-

consciousness than those who do not binge eat, *p* < .05. Women who endorsed binge eating

symptom also endorsed significantly higher levels of public self-consciousness than those who

did not binge eat, *p* < .05. Results are depicted in Figure 15.
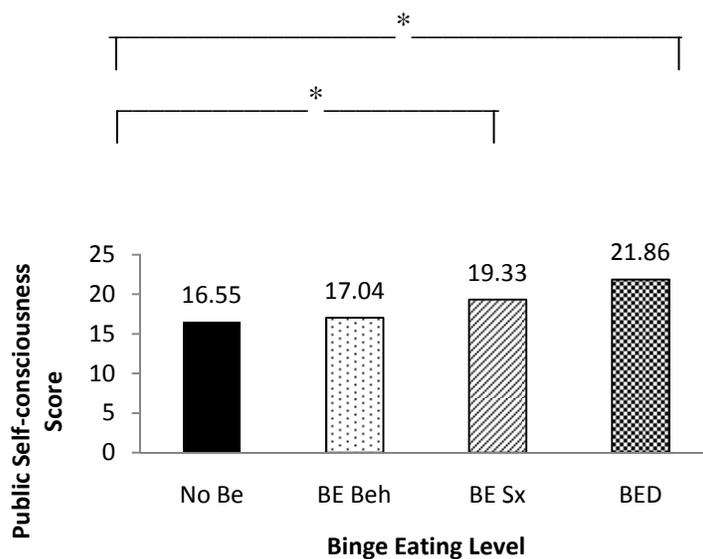
Figure 15: Public self-consciousness across binge eating level

Note. N = 295. No BE n = 214, BE Beh n= 50, BE Sx n = 24, BED n = 7. *F* (2, 291) = 4.924, *p* <

.05, η^2 = .048.

Finally, women who met full BED criteria endorsed significantly higher levels of social

anxiety between than those who do not binge eat, *p* < .05. Women who met BED criteria also

endorsed significantly higher levels of social anxiety than women who reported binge eating

behavior, *p* < .05. Results are depicted in Figures 16. Correlation coefficients for self-

consciousness subscale predictors of BE behavior, BE symptom, and BED among college

women are depicted in Table 4.
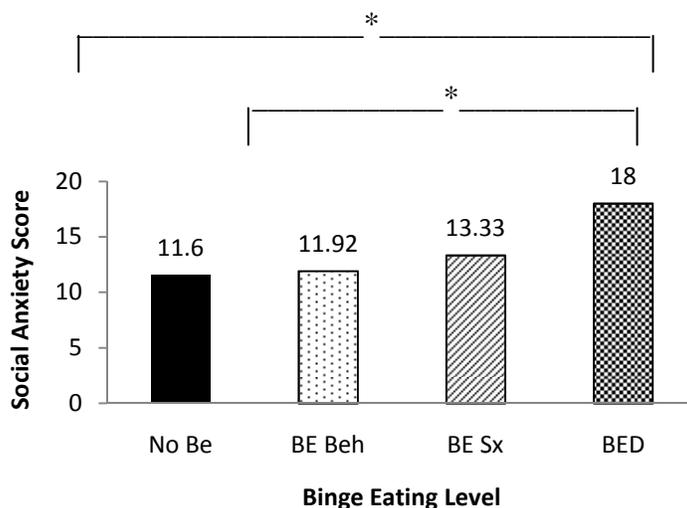
Figure 16: Social anxiety across binge eating level

Note. N = 295. No BE n = 214, BE Beh n= 50, BE Sx n = 24, BED n = 7. *F* (3, 291) = 3.737, *p* <

.05, η^2 = .037.

Table 6

Correlation coefficients for self-consciousness subscale predictors of BE behavior, BE symptom, and BED among college women

	BE Beh	BE Sx	BED	1	2	3	4	5	6
1. BMI[a]	0.10	**0.17***	0.10	--					
2. Depression[a]	**0.18***	**0.21***	**0.14**	**0.10**	--				
3. FNE	**0.18***	**0.21***	**0.21***	0.08	**0.39***	--			
4. Pr SCS	**0.15**	**0.13**	**0.15***	0.09	**0.36***	**0.41***	--		
5. Pu SCS	**0.15**	**0.21***	**0.16***	0.03	**0.37***	**0.67***	**0.59***	--	
6. SA	0.10	**0.15***	**0.17***	0.04	**0.28***	**0.49***	**0.31***	**0.48***	--

Note. $N = 295$. **$p < .05$, *$p < .01$.** [a]covariate

Hypothesis 3a: Does Identity Impairment Moderate the Relationship Between

Interpersonal Sensitivity and Binge Eating?

It was hypothesized that identity impairment would moderate the relationship between interpersonal sensitivity and binge eating, with those who had high levels of identity impairment and high levels of interpersonal sensitivity being most likely to binge eat. Moderation was tested with a logistic regression analysis predicting BE symptom, but not binge eating behavior or BED because no identity impairment variable was significantly related to the latter two constructs. The regression analysis included the identity variable and interpersonal sensitivity variable most strongly associated with BE symptom (as determined by a correlation matrix), along with their interaction term. A second logistic regression analysis was performed using these variables as well as the covariates (BMI and depression), to investigate whether identity impairment, interpersonal sensitivity, and their interaction predicted unique variance beyond what could be predicted by BMI and depression.

The correlation matrix revealed that FNE and negative possible selves were most strongly related to BE symptom. A logistic regression analysis showed that the interaction of FNE and total number of negative possible selves conferred additional risk for BE symptom, thus supporting moderation. The interaction term was significant even after controlling for BMI and depression, though depression was not a significant covariate (see Table 7). In addition, the nature of the interaction effect was explored by categorizing participants into high, medium, and low levels of FNE and negative possible selves, and plotting the percentage of each group that endorsed BE symptom. As is shown, having high levels of negative possible selves and moderate levels of FNE is strongly associated with having BE symptom. Having low or medium levels of both variables was not associated with BE symptom. Results are shown in Figure 17.
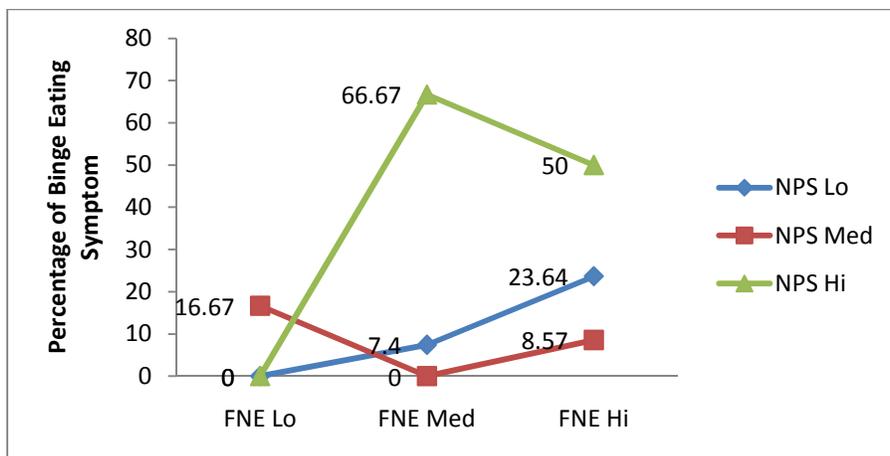
Figure 17: Interaction of fear of negative evaluation and negative possible selves on binge eating symptom

Note. N = 295

Statistically significant odds ratios from a logistic regression predicting BE symptom indicated that for each 1-point increase in BMI, the likelihood of the presence of the BE symptom increased by 8.2% (see Table 5). For each 1-point increase in FNE score, the likelihood of BE symptom increased by 11.6%. For each 1-point increase in negative possible selves, the likelihood of BE symptom increased six-fold. All predictor variables aside from depression were statistically significant in the final logistic regression model. These results imply that BMI, FNE, and negative possible selves add significant and unique variance when predicting BE symptom. In addition to FNE and negative possible selves each being significantly related to BE symptom, there was an interaction effect for the two variables when predicting BE symptom.

Table 7

Summary of Final Logistic Regression Models predicting Binge Eating Behavior, Binge

Eating Symptom, and Binge Eating Disorder

Final Model for Prediction of Binge Eating *Behavior*

Variable	B	S.E.	Wald	df	Sig.	Odds Ratio	95% Conf. Interval
Depression	.054	.027	3.914	1	.05	1.055	1.000-1.113
FNE	.029	.015	4.011	1	.05	1.030	1.001-1.060

Final Step X^2 (1, *N*=295) = 4.034, *p* <.05, Model X^2 (2) = 12.850, *p* <.01

Final Model for Prediction of Binge Eating *Symptom*

Variable	B	S.E.	Wald	df	Sig.	Odds Ratio	95% Conf. Interval
BMI	.079	.030	6.934	1	.008	1.082	1.020-1.148
Depression	.071	.038	3.443	1	.06	1.073	0.996-1.157
FNE	.110	.030	13.617	1	.000	1.116	1.053-1.183
NPS	1.828	.560	10.639	1	.001	6.222	2.074-18.664
Interaction	-.040	.014	7.564	1	.006	.961	0.934-0.989

Final Step X^2 (1, *N*=295) = 8.099, *p* <.01, Model X^2 (5) = 37.146, *p* <.001

Final Model for Prediction of Binge Eating Disorder

Variable	B	S.E.	Wald	df	Sig.	Odds Ratio	95% Conf. Interval
Depression	.064	.065	.963	1	.33	1.066	0.938-1.212
FNE	.135	.048	8.004	1	.005	1.145	1.042-1.257

Final Step X^2 (1, *N*=295) = 9.394, *p* <.01, Model X^2 (2) = 13.528, *p* <.01

Hypothesis 3b: Does Identity Impairment Mediate the Relationship between Interpersonal Sensitivity and Binge Eating?

As it was unclear how the relationship among binge eating, interpersonal sensitivity, and identity impairment would best be captured, mediation (specifically, identity impairment mediating the relationship between interpersonal sensitivity and binge eating) was also tested, but not supported. Mediation was only tested using binge eating symptom, as no identity variable was significantly associated with binge eating behavior or BED. Three steps to test mediation for BE symptom were performed. Step one involved illustrating that the initial variable was correlated with the outcome variable (e.g., FNE is related to BE symptom), $B = .069$, $SE = .020$, $OR = 1.071$, $p < .01$, indicating that FNE significantly predicted BE symptom. The second step involved demonstrating that the initial variable, FNE, was in fact correlated with total number of negative possible selves, $B = 0.17$, $SE = .008$, $t(294) = 2.071$, $p < .05$, indicating that individuals who endorse BE symptom had higher FNE scores. Third, analyses were conducted to test whether the purported mediator, total number of negative possible selves, in fact affects the dependent variable, BE symptom, after controlling for the influence of the predictor variable, $B = .299$, $SE = .114$, $OR = 1.349$, $p < .01$. The effect of the predictor variable (FNE) on the outcome variable (BE symptom) remained significant after including total number of negative possible selves in the model; thus mediation was not supported.

Discussion

The present study examined the prevalence of BED and the relationships between interpersonal sensitivity, identity impairment, and binge eating among college women. Identity impairment was measured using a possible selves questionnaire (Markus & Wurf, 1987) and interpersonal sensitivity was measured using fear of negative evaluation (Leary, 1983) and self-

consciousness (Fenigstein, Scheier, & Buss, 1975) questionnaires. Binge eating was conceptualized in three ways: as a behavior (consuming an unusually large amount of food in a short period of time), as a symptom (experiencing a loss of control during a binge eating episode), and as a disorder (meeting full BED criteria). Cases of subthreshold BED included women who did not binge frequently enough, who did not experience loss of control, or who did not have enough associated symptoms to meet full BED criteria. Results suggest that though both interpersonal sensitivity and identity impairment are associated with binge eating symptom, interpersonal sensitivity emerged as being much more strongly and more consistently associated with all levels of binge eating than did identity impairment.

Rate of Binge Eating Disorder

In this study, only 2.4% of participants met full BED criteria, which is lower than rates found in some previous studies (e.g., Gruzca, 2007; Saules et al., 2009). This led to an unexpected lack of statistical power for analyses involving BED in this study; though results were generally in the hypothesized direction, they were not always statistically significant. Although the reason for the discrepancy in BED rates is unknown, it necessitated restricting some data analyses to subthreshold BED cases. Despite low statistical power, however, SCS and FNE were significantly associated with full BED, implying that IPS is highly related to BED. Though the effect sizes for SCS and FNE on full BED were both small (about 0.06 and 0.06, respectively), the fact that any effect was produced with such little power is notable. These effect sizes were derived from interpreting the partial eta squared for each variable using Levine and Hullett's (2002) guidelines. These values are above the recommended minimum effect sizes for practical significance for social science data.

Possible Selves and Binge Eating

Contrary to our expectations, women who engaged in BE behavior, endorsed BE symptom, or met full BED criteria did not have significantly fewer total possible selves than did women who did not binge eat. Follow-up analyses revealed that women who engaged in BE behavior endorsed the same number of total possible selves as women who did not engage in BE behavior. This may be related to the low levels of depression endorsed by participants in this study. In this study, participant depression scores of the overall sample fell into the range that indicated only mild depressive symptoms. Perhaps higher levels of depression accounted for findings of the relationship between self-schemas and disordered eating in other studies. For example, in Stein and Corte's (2007) sample, 23% of women with anorexia and 26% of women with bulimia met criteria for current major depression.

Additionally, women who engaged in BE behavior, endorsed BE symptom, or met full BED criteria did not have a significantly lower number of positive possible selves than did women who did not binge eat. These results reflect a positive bias found in a study by Markus and Nurius (1986), which also used a sample of college students. Taken together, these results seem to indicate that college students are more likely to imagine positive things for themselves in the future, as opposed to negative things. This study's findings also indicate that the assertion made by Stein and Corte (2007) that identity impairment is a core etiological feature of eating disorders may not apply to BED. In fact, results suggest it may be that feelings of inadequacy in social or interpersonal situations are far more relevant than identity impairment more generally.

Though women with BE behavior did not endorse significantly higher numbers of negative possible selves, in the first set of analyses, women with BE symptom or BED did. In the follow-up analysis, though there was not enough power in the BED group to detect differences,

the mean was quite high. These results are similar to other findings in which women with disordered eating endorsed more negative self-schemas than did controls (Stein & Corte, 2007).

In the present study, the most commonly endorsed negative possible selves were "ordinary," "have a breakdown," "alone," and "depressed." Individuals in the BED group were most likely to endorse the negative possible self of being depressed. This seems to be not only reflective of current depression (the mean score for this group was just short of the moderate range), but also reflective of the idea that they view it as a lasting condition. In addition, the BED group was most likely to endorse the negative possible self of being drug or alcohol dependent. The BED group was also most likely to endorse the negative possible self of having a breakdown. As bulimia has been commonly associated with psychological comorbidies such as depression and substance abuse (e.g., Carbaugh & Sias, 2010; Wiederman & Pryor, 1999), these results may reflect other ways in which BED is similar to bulimia.

These results also indicate that it is not just overeating, but the psychological features of BED and BE symptom (loss of control and associated symptoms) that may be related to negative possible selves. Furthermore, these results, along with previous reports of differences in early maladaptive schemas among eating disorder subgroups (Unoka, Tflgyes, & Czobor, 2007), lend further support to the notion that the identity impairment theory does not apply to BED the same way it applies to bulimia.

Contrary to our hypothesis, women who engaged in BE behavior and women with BED did not have a higher ratio of negative to total possible selves than did women who did not binge eat. The theory behind this variable is that having many identities is protective, but not if they are predominately negative identities (e.g., Linville, 1985). In addition, Markus and Nurius (1986) explain, "Thus, when a negative possible self is activated, for example, it brings with it the

associated negative affect, which, in turn, can have a marked impact on the form and content of subsequent behavior" (cf. Bower,

1981; Clark & Isen, 1982; Salovey & Rodin, 1985). Instead, the more optimal scenario is that individuals have some balance in their identities, though mostly in the direction of feeling positive or realistic about oneself.

Though women with BE symptom did have a significantly higher ratio of negative to total possible selves than did women who did not binge eat in initial analyses, follow-up analyses indicated that there were no differences between any of the binge eating levels, thus these results do not support a strong link between identity impairment and binge eating. This suggests that the identity-eating disorder theory may be flawed, or that the theory does not apply to BED in the way Stein and Corte (2007) found that it applies to bulimia and anorexia. This lends support for the idea that BED is a unique disorder, rather than a variant of bulimia. Furthermore, it provides evidence for the inclusion of BED as a unique disorder in the DSM-V.

Interpersonal Sensitivity and Binge Eating

As predicted, women who engaged in BE behavior, endorsed BE symptom, or met full BED criteria had significantly higher levels of FNE than did women who did not binge eat. Follow-up analyses revealed that BE symptom and BED were significantly different from the other levels of binge eating, indicating that it is not just overeating, but the psychological features of BED and BE symptom (loss of control and associated symptoms) that may be related to FNE. This supports previous research in which loss of control was more strongly linked than associated symptoms to psychological variables related to distress found in BED (Colles, Dixon, & O'Brien, 2008). Individuals who experienced high levels of emotional disturbance due to loss of control during binge eating episodes also reported more depressive symptoms and poorer

psychological quality of life. These results imply that even if individuals do not meet full BED criteria (e.g., they do not binge frequently enough), the experience of subjective loss of control is related to psychological disturbances. In other words, subclinical BED may still warrant treatment. This, along with our results, supports the proposed changes to BED diagnostic criteria, which includes reducing the frequency and duration of binge eating.   Furthermore, it is in line with Fairburn and colleagues' transdiagnotic theory of eating disorders, which posits that eating disorders (including EDNOS) share core pathologies and similar maintenance mechanisms (Fairburn, Cooper, & Shafran, 2003). The transdiagnostic theory of eating disorders also reflects the phenomenon that individuals may change eating disorder category or move from subthreshold to threshold multiple times over the course of their lives.

FNE appears to be an important component of binge eating. Not only has negative evaluation been found to trigger eating disorder symptoms such as binge eating, but eating disorder symptoms have also been found to contribute to negative self-evaluation, creating a cycle (Reiger, Van Buren, Bishop, Tanofsky-Kraff, Welch, & Wilfely, 2010). Additionally, social problems have been found to be positively correlated with loss of control in eating in children and adolescents, with negative affect mediating the relationship between social problems and loss of control (Elliott, Tanofsky-Kraff, Shomaker, Columbo, Wolkoff, Ranzenhofer, & Yanovski, 2010). Furthermore, the effects of low affiliation were mediated by negative affect in a sample of women who engaged in binge eating, emphasizing the importance of social support (Ansell, Grilo, & White, 2011). This provides further support for the idea that binge eating episodes may occur as a result of negative social interactions (or the perception thereof).

As hypothesized, women with BE behavior, BE symptom, and BED also had significantly higher levels of self-consciousness than did women who did not binge eat. The self-consciousness measure had three subscales, which measured private self-consciousness, public self-consciousness, and social anxiety. Correlations revealed that the three subscales were strongly correlated with binge eating variables, including full BED criteria; this is notable, given that there were so few participants meeting full BED criteria. As social anxiety has been linked to bulimia as well, (Penas-Lledó et al., 2010), these results further support the theory that both bulimia and BED share interpersonal sensitivity as a common feature.

Overall, as hypothesized, IPS was strongly related to binge eating variables, regardless of how IPS was measured (FNE vs. SCS). FNE and SCS are constructs similar to social anxiety, which implies that women may binge eat to cope with social insecurities. Both of these IPS constructs are associated with bulimia (e.g. Stein & Corte, 2008; Streigel-Moore, Silberstein & Rodin, 1993), which indicates there may be some overlap between binges that occur in bulimia and those that occur in BED. For example, FNE accounted for 49% of the variance in a dual-pathway model predicting bulimia (Utschig, Presnell, Madeley, & Smits, 2010). The dual-pathway model theorizes that bulimic symptomatology develops as a result of five risk factors: social pressure to be thin, internalizing the thin-ideal, body dissatisfaction, dieting, and negative affect (Stice & Agras, 1998). The theory states that perceived social pressure to be thin leads to an internalization of the thin-ideal, which in turn leads to body dissatisfaction. Body dissatisfaction then leads to dieting behavior and negative affect. The dual pathways of negative affect and dieting have also been found to mediate the other variables, yielding bulimic symptoms.

In addition, a link between bulimia and narcissism, specifically vulnerable narcissism, has been found (Maples, Collins, Miller, Fischer, & Seibert, 2011). The concept of vulnerable narcissism is similar to that of IPS, in that both are associated with high levels of neuroticism and internalizing symptoms. In addition, individuals with vulnerable narcissism tend to have low levels of agreeableness and extraversion. Vulnerable narcissism was significantly correlated with bulimia, while grandiose narcissism (a more overt form of narcissism) was not. A substantial proportion of shared variance between bulimia and vulnerable narcissism is accounted for by neuroticism, indicating negative emotionality and interpersonal problems are related to both constructs.

This study provides more support for the theory that women may binge eat in order to cope with negative social experiences. This is consistent with previous literature that highlights the role of interpersonal difficulties play in the maintenance of eating disorders (e.g. Fairburn, Cooper, & Shafran, 2003). More specifically, compared to controls, women with subclinical bulimia were more likely to believe they had made negative impressions during social interactions with women who served as interaction partners (Rofey, Kisler-van Reede, Landsbaugh, & Corcoran, 2006). This discrepancy existed even after controlling for self-esteem, social desirability, and fear of negative evaluation. Another study found that compared to controls, women with BED were less effective and less specific when attempting to generate solutions to interpersonal problems (Svaldi, Dorn, & Trentowska, 2010). In addition, this lack of interpersonal problem-solving was related to an increased frequency of binge eating. This finding lends support to the idea that social skills training and interventions aimed at strengthening interpersonal problem-solving skills may be important to include in BED treatment.

Interaction Effect

In addition to FNE and negative possible selves each being associated with binge eating symptom, a logistic regression showed that the interaction of FNE and negative possible selves also predicted unique variance for binge eating symptom. The nature of the interaction effect was explored by categorizing participants into high, medium, and low levels of FNE and negative possible selves, and plotting the percentage of each group that endorsed BE symptom. Having low or medium levels of both variables was not associated with BE symptom. Interestingly, the largest group in the interaction was made up of individuals who had high levels of negative possible selves and medium levels of FNE. It should be noted that the range for negative possible selves endorsed was quite narrow (0-8). This indicates that endorsing even relatively few negative possible selves can be problematic. It is possible that high levels of negative possible selves in combination with medium levels of FNE may be most problematic, as individuals with high levels of FNE may be more likely to avoid social situations, thus avoiding consequences of negative interactions. Individuals with moderate levels of FNE may be more willing to engage in social situations, albeit with some ambivalence.

Body Mass Index

In our sample, the average BMI increased across each binge eating level, though differences were slight, as the average BMI for all groups was in the overweight range. Interestingly, BMI accounted for more variance in the prediction of binge eating variables than did possible selves variables. It is also somewhat surprising that such low rates of binge eating were found among a relatively overweight sample. These rates suggest that participants in this sample may be engaging in other forms of overeating (e.g., grazing, nocturnal eating) instead of binge eating. It is also possible that they are underreporting portion size and might actually be

binge eating, objectively, but don't subjectively regard it as such. Additionally, the findings in this study suggest that college students are certainly not impervious to the obesity epidemic. Though higher levels of education are typically a protective factor against obesity, the relationship between education and obesity has lessened over the past three decades as rates of obesity have increased (Zhang & Wang, 2004).

Additionally, BMI was negatively correlated with the number of total possible selves and the number of positive possible selves endorsed. This indicates that women with higher BMIs may endorse fewer total possible selves and fewer positive possible selves. By extension, this reflects literature showing that domains of self-concept and interpersonal sensitivity are associated with binge eating and low self-esteem in obese individuals, with the relationship between binge eating and interpersonal sensitivity being partially mediated by self-esteem. (Lo Coco, Gullo, Salerno, & Iacoponelli, 2011).

Depression

IPS variables were also positively correlated with depression, supporting previous research in which interpersonal sensitivity was linked with a host of issues such as higher depression scores and earlier and greater chronicity of depression (e.g., Davidson, Zisook, Giller, & Helms, 1989). Overall, as opposed to identity variables, IPS seems to be much more strongly and more consistently associated with BE variables; based on the IPS results, it appears there is enough power to detect differences among BE variables in terms of identity impairment, even with a very small sample of participants who meet full BED criteria.

Overall, and contrary to study hypotheses, possible selves variables were not strongly associated with binge eating. The main exception was the number of negative possible selves women endorsed, which was associated with BE behavior and BE symptom. This is important to

know, given that impairments in identity have been linked with other problems such as anorexia, bulimia, cigarette use, and alcoholism (e.g. Corte & Stein, 2005; Kendzierski, 2007; Shadel & Mermelstein, 1996). In addition, the correlations between possible selves and depression were in the hypothesized direction. More specifically, negative possible selves were positively correlated with depression, while total possible selves were negatively correlated with depression. These results are in line with previous research (e.g., Penland, Masten, Zelhart, Fournet, & Callahan, 2000) reporting that individuals who are depressed are more likely to endorse fewer positive selves and more negative possible selves than are non-depressed individuals.

Subthreshold Binge Eating Disorder

Though there is some overlap among BE behavior, BE symptom, and BED, there are subtle differences between these variables. This raises important issues about the integrity of the BED diagnosis, especially with respect to subthreshold cases. This study indicated that women meeting full BED criteria differ from women in other groups, suggesting that there are important distinctions to be made between BED and subclinical manifestations, specifically between BED and BE behavior (as BE Beh does not have the psychological aspects of BED and BE symptom). This supports the diagnosis of BED as a unique entity that likely warrants inclusion in DSM-5, given that it seems to capture more than just overeating, as it is associated with interpersonal deficits. Furthermore, it appears that loss of control goes beyond simple overeating, as our results show that the BE Beh group was similar in many ways to the non-binge eating group. As simply engaging in binge eating only does not warrant the diagnosis of BED, it is not surprising that those in the BE Beh group are most similar to the non-binge eating group.

Because BE symptom was so strongly linked with identity impairment and interpersonal sensitivity, it appears that subthreshold BED is still problematic. This is consistent with the

literature showing that subthreshhold eating disorders are linked with a host of issues, such as suicide attempts, distress and impairment in functioning, medical problems, and an increased risk for developing medical and psychological problems in the future (Crow, Agras, Halmi, Mitchell, & Kraemer, 2002; Garfinkel et al., 1995; Keel, Haedt, & Edler, 2005; Milos, Spindler, Schnyder, & Fairburn, 2005; Mond et al., 2006; Stice, Marti, Spoor, Presnell, & Shaw, 2008; Striegel-Moore, Seeley, & Lewinsohn, 2003). This has interesting implications for the proposed revisions to BED criteria. These revisions include reducing the number of binges from at least twice per week for six months to at least once per week for three months (Keel, Brown, Holm-Denoma, & Bodell, in press). By reducing the stringency of the diagnostic criteria, it will likely increase the number of individuals who have Binge Eating Disorder rather than EDNOS, as cases that were formerly subthreshold will now meet full criteria. It is yet to be seen how this may affect the integrity of the diagnosis.

Treatment Implications

The results of this study are consistent with other reports linking IPS to binge eating (such as Fairburn's transdiagnostic theory of eating disorders), indicating that BED and bulimia appear to share the IPS element. However, the results of this study are not consistent with reports that identity impairment is related to eating disorder symptomatology, suggesting the identity impairment theory does not apply to BED in the same way it may apply to bulimia. This lends support to the idea that BED is a unique diagnostic entity that may differ in as-yet poorly understood ways from bulimia.

Future research should investigate how IPS can be targeted in the treatment of binge eating. Specifically, FNE appears to be most strongly linked to binge eating. As FNE is a key component of social anxiety, incorporating strategies to address social anxiety may optimize the

effectiveness of BED treatment. Given that social phobia is the second most common comorbid disorder with eating disorders, it may be helpful to draw from the existing literature on social anxiety treatment (Kaye, Bulik, Thornton, Barbarich, & Masters, 2004).

Rodebaugh, Holaway, and Heimberg (2004) summarized meta-analytic studies of the efficacy of CBT for social phobia. Overall, CBT for social phobia had medium to large effect sizes, with little difference between the effectiveness of various components. The main components of CBT include exposure and cognitive restructuring (Heimberg, 2002). The exposure component consists of having individuals face their feared situation (such as interacting with strangers) and staying in the situation until their anxiety naturally lowers. The cognitive restructuring component consists of teaching individuals to identify the negative thoughts that occur prior to, during, and after feared situations. Individuals are also taught to question their negative thoughts and replace them with more rational ones; rational thoughts are in part derived from exposure exercises. CBT for social phobia may also include social skills or relaxation training. Individuals with social anxiety may have social deficits, such as poor eye contact, which may impact how others relate to them. Social skills training may include elements such as role-play, therapist modeling, corrective feedback, and homework assignments. Relaxation training may also be used to help individuals reduce physiological arousal. Perhaps including elements of CBT for social phobia would be helpful when treating binge eating.

Another way of addressing IPS and binge eating may be to help individuals increase their social support. In related research, emotion-oriented coping has been found to mediate the relationship between FNE and eating disorder symptomatology (Wonderlich-Tierney and Vander Wal (2010)). In addition, the relationship between social anxiety and eating disorder

symptomatology was moderated by social support. By targeting these areas in treatment, it may be possible to reduce symptoms of binge eating and BED.

Results from the present study suggest that, albeit to a lesser degree, addressing identity impairment during treatment of binge eating may be important as well. Current treatment for identity impairment is lacking, though one suggested treatment includes helping individuals replace negative self-schemas with more positive self-schemas (Stein & Corte, 2007). This approach may compliment other cognitive work when addressing FNE, particularly given the significant interaction for FNE and negative possible selves found in this study. Another approach that has received some empirical support is Jeffrey Young's Schema Therapy (Young, Klosko, & Marjorie E. Weishaar, 2003, p. 7), which is based on the theory that early maladaptive schemas, or "self-defeating emotional and cognitive patterns that begin early in our development and repeat throughout our life" develop as a result of early experiences and emotional temperament. Young (2003) also theorizes that early maladaptive schemas contribute to characterological or chronic axis I disorders such as eating disorders (Young, Klosko, & Marjorie E. Weishaar, 2003). Young's (2003) schema therapy targets five domains, which include disconnection and rejection, impaired autonomy and performance, impaired limits, other directedness, and overvigilance and inhibition. Additionally, maladaptive coping styles related to early maladaptive schemas are addressed in treatment. Perhaps using this theory to target and replace negative possible selves would be effective.

Limitations of the Present Study

This study has several limitations that should be noted. One major limitation of this study is the aforementioned low statistical power for some analyses involving full BED criteria. As results are generally in the expected direction, possible selves variables may have been

significantly related to BED if there had been more participants in the sample who met full BED criteria. It is unclear from this study whether or not possible selves are largely unrelated to BED or the low statistical power for BED analyses accounts for the lack of significant relationships between BED and possible selves variables. However, as IPS variables were strongly linked with BED despite low statistical power, it is likely that identity variables are simply not as strongly related to BED.

Another potential limitation of this study is generalizability. Generalizability of findings may be limited to college student populations similar to the study sample. For example, data collection was limited to undergraduate classes. This sample may differ from others on variables such as religiosity and liberalness, with college students being less religious and more liberal compared to individuals not in college (e.g., Bishop, Lacour, Nutt, Yamada, & Lee, 2004). Additionally, though lower rates of BED were found in our sample, it is likely this sample is more overweight compared to average college student samples. The average BMI in this sample was 25.35 (*SD*= 5.72), which is in the overweight range; the mean BMI for a national sample of college students from the 2010 Healthy Minds Study, however, was 23.83 (*SD* = 4.64), which is in the average range (Reslan, 2010). This may be a function of socioeconomic status overriding the effect of education, as many students in this sample are first-generation college students. More specifically, they may not have the benefit of a highly educated family structure that might otherwise support healthy eating.

An additional potential limitation of this study is that BMI was calculated using self-reported height and weight. There are faults with this method, such as the tendency for individuals to over report height and underreport weight (e.g., Seghers & Claessens, 2010;

Gorber, Tremblay, Moher, & Gorber, 2007). However, this limitation is not particularly

concerning given BMI was a covariate and not a main construct of interest in this study.

Conclusion

Due to a lack of statistical power for some Binge Eating Disorder analyses, binge eating

symptom (i.e., eating a large quantity of food accompanied by a sense of loss of control) was

used for some hypotheses in this study. Results suggest that interpersonal sensitivity and identity

impairment are associated with this aspect of binge eating. More specifically, college women

who met criteria for binge eating symptom endorsed higher levels of fear of negative evaluation

and self-consciousness and had more total negative possible selves, relative to women who did

not meet criteria for binge eating symptom. In addition, the interaction of high levels of identity

impairment and moderate levels of interpersonal sensitivity conferred additional risk for binge

eating symptom. Results suggest that interpersonal sensitivity and some aspects of identity

impairment contribute unique variance to the prediction of binge eating, and thus may be

important to consider in future treatment research on Binge Eating Disorder.

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Appendix A
Informed Consent

Thank you for participating in this research project about the relationship between alcohol use, eating habits, and self-concept. Before you agree to continue, you need to know why we are doing this research, what we will be asking you to do, and that your participation will be completely anonymous. Please read the following information carefully.

In this study, you will be asked to fill out an online survey that will take about 30 minutes to complete. Questions on the survey will ask about your self-concept, eating habits, and alcohol use. Additional demographic and background information such as your sex, age, race, marital status, and employment will also be asked.

This study is being conducted by Dr. Karen Saules and the Department of Psychology at Eastern Michigan University.

The researchers are trying to understand how self-concept may be related to specific behaviors, such as alcohol use and eating habits. The research team is hopeful that the information obtained will contribute to our understanding of what role self-concept may play in certain health behaviors in order to help people live healthier lives.

You must be at least 18 years old to participate. Your responses are confidential. No personally identifying information is included in the questionnaires. Your answers will be identified by a code number only. Results will be presented without any individually identifying information. However, the Institutional Review Board at Eastern Michigan University or federal agencies with appropriate regulatory oversight may review the records.

Taking part in this study is completely voluntary and you have the right to stop participating at any time without penalty.

There are no known or anticipated risks of participating in this study. If, however, answering this survey causes you distress for which you might like some assistance, please note that low cost or free psychological services may be available through the EMU Psychology Clinic (734.487.4987) or EMU Counseling & Psychological Services(734.487.1122); the latter is free to EMU students. You may also call the Principal Investigator, Dr. Saules (734.487.4987), and she will be happy to speak with you about other referral sources that might be able to assist you.

You will not be paid for taking part in the study.

The results will be sent to scientific journals for publication and to professional conferences for presentation to other professionals. As a participant, you are entitled to meet with the researchers to obtain the results of the study, and for any other questions or concerns.

By completing and submitting the questionnaire, you will be giving informed consent for the researchers to use the information you provide.

This research protocol and informed consent document has been reviewed and approved by the Eastern Michigan University Human Subjects Review Committee. If you have questions about the approval process, please contact Dr. Deb de Laski-Smith (734.487.0042, Interim Dean of the Graduate School and Administrative Co-chair of UHSRC, human.subjects@emich.edu).

Please contact Dr. Karen Saules (734.487.4987 or ksaules@emich.edu) of the Eastern Michigan University Department of Psychology if you have any questions or concerns.

If you have read all of the above and would like to take part in this study, click the NEXT button below. By doing so, you are giving informed consent for us to use your responses in this study.

If you do not wish to take part in this study, just close this window.

Appendix B
Demographics Questionnaire

1. How old are you?

[   ]

2. Are you

○ Male?

○ Female?

○ Transgender?

○ Refuse to Answer

3. How tall are you?

Feet [   ]

Inches [   ]

4. How much do you currently weigh? (In pounds)

[   ]

5. Some people identify themselves as belonging to one or more racial or ethnic groups. Please check the box(es) below which correspond to group(s) you belong to:

☐ White or Caucasian

☐ Black or African-American

☐ Hispanic or Latino

☐ American Native

☐ Alaskan Native

☐ Asian

☐ Pacific Islander

☐ Middle Eastern

☐ Refuse to Answer

☐ Do you consider yourself to be of any other race or ethnic group? If so, what is it?

[   ]

6. How many years of education have you completed? (Completing high school or its equivalent = 12 years)

---

7. What is your current marital status?
Please check one:

- ☐ Married
- ☐ Single
- ☐ Divorced
- ☐ Remarried
- ☐ Widowed
- ☐ Separated
- ☐ Living with partner (same sex)
- ☐ Living with partner (opposite sex)
- ☐ Refuse to Answer

8. Are you

- ☐ Heterosexual?
- ☐ Gay/Lesbian/Queer?
- ☐ Bisexual?
- ☐ Refuse to answer

9. What is your current employment status?
Please check one:

- ☐ Full Time (>35 hrs/wk)
- ☐ Part Time (Regular hours)
- ☐ Part Time (Irregular hours)
- ☐ Unemployed, full time student
- ☐ Unemployed, part time student

☐ Retired/Disability

☐ Military Service

☐ Refuse to Answer

10. What is the economic status of your current household?
Please check one:

☐ We have barely enough to get by

☐ We have enough to get by, but no more

☐ We are solidly middle class

☐ We have plenty of "extras"

☐ We have plenty of "luxuries"

☐ Don't know/unsure/prefer not to say

11. What is your annual household income?
(Select One Answer)

☐ >$150,000

☐ $100,000-$149,000

☐ $75,000-$99,000

☐ $50,000-$74,000

☐ $25,000-$49,000

☐ $10,000-$24,000

☐ <$9,000

☐ Don't know, or prefer not to say

Appendix C
Possible Selves Questionnaire (PSQ)

Probably everyone thinks about their future some times. When doing so we usually think about what might happen to us and the kinds of people we might possibly become. Listed below are a number of possible selves that other people have thought of. We are interested in what possible selves you may have considered.

1. Please indicate the degree to which you think that the following characteristics WILL describe you in the FUTURE.

	Not At All		Somewhat			Very Much	
In good shape	1	2	3	4	5	6	7
Athletic	1	2	3	4	5	6	7
Financially secure	1	2	3	4	5	6	7
Travel extensively	1	2	3	4	5	6	7
Content with life	1	2	3	4	5	6	7
Self-employed	1	2	3	4	5	6	7
Living in a nursing home	1	2	3	4	5	6	7
Long-lived	1	2	3	4	5	6	7
Ordinary	1	2	3	4	5	6	7
Good parent	1	2	3	4	5	6	7
Famous	1	2	3	4	5	6	7
Have a breakdown	1	2	3	4	5	6	7
In poor health	1	2	3	4	5	6	7
Close to family	1	2	3	4	5	6	7
Unemployed	1	2	3	4	5	6	7
Alone	1	2	3	4	5	6	7
Street person	1	2	3	4	5	6	7
Unwanted/forgotten by my family	1	2	3	4	5	6	7
Married	1	2	3	4	5	6	7
On welfare	1	2	3	4	5	6	7
Creative	1	2	3	4	5	6	7
Divorced	1	2	3	4	5	6	7
Physically disabled	1	2	3	4	5	6	7
Depressed	1	2	3	4	5	6	7
Spouse/child abuser	1	2	3	4	5	6	7
Competent	1	2	3	4	5	6	7
Loved	1	2	3	4	5	6	7
Bored	1	2	3	4	5	6	7
In good health	1	2	3	4	5	6	7
Not in control of your life	1	2	3	4	5	6	7
Carefree	1	2	3	4	5	6	7
Drug/alcohol dependent	1	2	3	4	5	6	7

Appendix D
Patient Health Questionnaire (PHQ-9)

1. Over the last 2 weeks, how often have you been bothered by any of the following problems?				

	Not at all	**Several days**	**More than half the days**	**Nearly every day**
B1. Little interest or pleasure in doing things	☐	☐	☐	☐
B2. Feeling down, depressed, or hopeless	☐	☐	☐	☐
B3. Trouble falling or staying asleep, or sleeping too much	☐	☐	☐	☐
B4. Feeling tired or having little energy	☐	☐	☐	☐
B5. Poor appetite or overeating	☐	☐	☐	☐
B6. Feeling bad about yourself - or that you are a failure or have let yourself or your family down	☐	☐	☐	☐
B7. Trouble concentrating on things, such as reading the newspaper or watching television	☐	☐	☐	☐
B8. Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual	☐	☐	☐	☐
B9. Thoughts that you would be better off dead or of hurting yourself in some way	☐	☐	☐	☐

Appendix E
Questionnaire on Eating and Weight Patterns Revised (QEWP-R)

What has been your highest weight ever (when not pregnant)?

Have you ever been overweight by at least 10 lbs as a child or 15 lbs as an adult (when not pregnant)?

○ Yes

○ No or Not Sure

How old were you when you were first overweight (at least 10 lbs as a child or 15 lbs as an adult)? If you are not sure, what is your best guess?

How many times (approximately) have you lost 20 lbs or more - when you weren't sick - and gained it back?

○ Never

○ Once or twice

○ Three or four times

○ Five times or more

During the past six months, did you often eat within any two hour period what most people regard as an unusually large amount of food?

○ Yes

○ No

During the times you ate this way, did you feel you couldn't stop eating or control what or how much you were eating?

○ Yes

○ No

During the past six months, how often, on average, did you have times when you ate this way - that is, large amounts of food plus the feeling that your eating was out of control? (There may have been some weeks when it was not present - just average those in).

☐ Less than once a week

☐ One day a week

☐ Two or three days a week

☐ Four or five days a week

☐ Nearly every day

Did you usually have any of the following experiences during these occasions?

	Yes	No
Eating much more rapidly than usual?	☐	☐
Eating until you felt uncomfortably full?	☐	☐
Eating large amounts of food when you didn't feel physically hungry?	☐	
Eating alone because you were embarrassed by how much you were eating?	☐	☐
Feeling disgusted with yourself, depressed, or very guilty after overeating?	☐	☐

Think about a typical time when you ate this way - that is, large amounts of food plus the feeling that your eating was out of control.

What time of day did the episode start?

- ⬜ Morning (8 AM to 12 Noon)
- ⬜ Early afternoon (12 Noon to 4 PM)
- ⬜ Late afternoon (4 PM to 7 PM)
- ⬜ Evening (7 PM to 10 PM)
- ⬜ Night (Aftern 10 PM)

Approximately how long did this episode of eating last, from the time you started to eat to when you stopped and didn't eat again for at least two hours (in hours)?

As best you can remember, please list everything you might have eaten or drunk that episode. If you ate for more than two hours, describe the foods eaten and liquids drunk during the two hours that you ate most. Be specific - include brand names where possible, and amounts as best as you can estimate. (For example: 7 ounces Ruffles potato chips; 1 cup Breyer's chocolate ice cream with two teaspoons hot fudge; 2 8-ounce glasses of Coca-cola; 1 & 1/2 ham and cheese sandwiches with mustard).

At the time this episode started, how long had it been since you had previously finished eating a meal or snack? (In hours)

In general, during the past six months, how upset were you by overeating (eating more than you think is best for you)?

- ⬜ Not at all
- ⬜ Slightly
- ⬜ Moderately
- ⬜ Greatly
- ⬜ Extremely

In general, during the past six months, how upset were you by the feeling that you couldn't stop eating or control how much you were eating?

○ Not at all

○ Slightly

○ Moderately

○ Greatly

○ Extremely

During the past six months, how important has your weight or shape been in how you feel about or evaluate yourself as a person - as compared to other aspects of your life, such as how you do at work, as a parent, or how you get along with other people?

○ Weight and shape were not very important

○ Weight and shape played a part in how you felt about yourself

○ Weight and shape were among the main things that affected how you felt about yourself

○ Weight and shape were the most important things that affected how you felt about yourself

During the past three months, did you ever make yourself vomit in order to avoid gaining weight after binge eating?

○ Yes

○ No

How often, on average, was that?

○ Less than once a week

○ Once a week

○ Two or three times a week

○ Four or five times a week

○ More than five

During the past three months, did you ever take more than twice the recommended dose of laxatives in order to avoid gaining weight after binge eating?

○ Yes

○ No

How often, on average, was that?

○ Less than once a week
○ Once a week
○ Two or three times a week
○ Four or five times a week
○ More than five times a week

During the past three months, did you ever take more than twice the recommended dose of diuretics (water pills) in order to avoid gaining weight after binge eating?

○ Yes
○ No

How often, on average, was that?

○ Less than once a week
○ Once a week
○ Two or three times a week
○ Four or five times a week
○ More than five times a week

During the past three months, did you ever fast - not eat anything at all for at least 24 hours - in order to avoid gaining weight after binge eating?

○ Yes
○ No

How often, on average, was that?

○ Less than one day a week
○ One day a week
○ Two or three days a week

- ☐ Four or five days a week
- ☐ Nearly every day

During the past three months, did you ever exercise for more than an hour specifically in order to avoid gaining weight after binge eating?

- ☐ Yes
- ☐ No

How often, on average, was that?

- ☐ Less than once a week
- ☐ Once a week
- ☐ Two or three times a week
- ☐ Four or five times a week
- ☐ More than five times a week

During the past three months, did you ever take more than twice the recommended dose of a diet pill in order to avoid gaining weight after binge eating?

- ☐ Yes
- ☐ No

How often, on average, was that?

- ☐ Less than once a week
- ☐ Once a week
- ☐ Two or three times a week
- ☐ Four or five times a week
- ☐ More than five times

During the past six months, did you go to any meetings of an organized weight control program (e.g. Weight Watchers, Optifast, Nurtisystem) or a self-help group (e.g. TOPS, Overeaters Anonymous)?

⊙ Yes

⊙ No

What was the name of the program?

[_____]

Since you have been an adult - 18 years old - how much of the time have you been on a diet, been trying to follow a diet, or in some way been limiting how much you were eating in order to lose weight or keep from regaining the weight you had lost? Would you say...?

⊙ None or hardly any of the time

⊙ About a quarter of the time

⊙ About half of the time

⊙ About three-quarters of the time

⊙ Nearly all of the time

Appendix F
Brief version of the Fear of Negative Evaluation Scale (Brief-FNE)

Read each of the following statements carefully and indicate how characteristic it is of you according to the following scale:

Not at all characteristic of me
Slightly characteristic of me
Moderately characteristic of me
Very characteristic of me
Extremely characteristic of me

1. I worry about what other people will think of me even when I know it doesn't make any difference.

- Not at all characteristic of me
- Slightly characteristic of me
- Moderately characteristic of me
- Very characteristic of me
- Extremely characteristic of me

2. I am unconcerned even if I know people are forming an unfavorable impression of me.

- Not at all characteristic of me
- Slightly characteristic of me
- Moderately characteristic of me
- Very characteristic of me
- Extremely characteristic of me

3. I am frequently afraid of other people noticing my shortcomings.

- Not at all characteristic of me
- Slightly characteristic of me
- Moderately characteristic of me
- Very characteristic of me
- Extremely characteristic of me

4. I rarely worry about what kind of impression I am making on someone.

○ Not at all characteristic of me

○ Slightly characteristic of me

○ Moderately characteristic of me

○ Very characteristic of me

○ Extremely characteristic of me

5. I am afraid others will not approve of me.

○ Not at all characteristic of me

○ Slightly characteristic of me

○ Moderately characteristic of me

○ Very characteristic of me

○ Extremely characteristic of me

6. I am afraid that people will find fault with me.

○ Not at all characteristic of me

○ Slightly characteristic of me

○ Moderately characteristic of me

○ Very characteristic of me

○ Extremely characteristic of me

7. Other people's opinions of me do not bother me.

○ Not at all characteristic of me

○ Slightly characteristic of me

○ Moderately characteristic of me

○ Very characteristic of me

○ Extremely characteristic of me

8. When I am talking to someone, I worry about what they may be thinking about me.

☐ Not at all characteristic of me

☐ Slightly characteristic of me

☐ Moderately characteristic of me

☐ Very characteristic of me

☐ Extremely characteristic of me

9. I am usually worried about what kind of impression I make.

☐ Not at all characteristic of me

☐ Slightly characteristic of me

☐ Moderately characteristic of me

☐ Very characteristic of me

☐ Extremely characteristic of me

10. If I know someone is judging me, it has little effect on me.

☐ Not at all characteristic of me

☐ Slightly characteristic of me

☐ Moderately characteristic of me

☐ Very characteristic of me

☐ Extremely characteristic of me

11. Sometimes I think I am too concerned with what other people think of me.

☐ Not at all characteristic of me

☐ Slightly characteristic of me

☐ Moderately characteristic of me

☐ Very characteristic of me

☐ Extremely characteristic of me

12. I often worry that I will say or do the wrong things.

☐ Not at all characteristic of me

- ☐ Slightly characteristic of me
- ☐ Moderately characteristic of me
- ☐ Very characteristic of me
- ☐ Extremely characteristic of me

Appendix G
Self-consciousness Scale

Below are twenty-three statements that may or may not be characteristic of the way you see
yourself as a person. Read each one carefully and rate whether the statement is characteristic of
uncharacteristic or you using the rating scale below. Select your answer after each question from
one of the options provided.

Extremely uncharacteristic
Generally uncharacteristic
Equally characteristic and uncharacteristic
Generally characteristic
Extremely characteristic

1. I'm always trying to figure myself out.

- ☐ Extremely uncharacteristic
- ☐ Generally uncharacteristic
- ☐ Equally characteristic and uncharacteristic
- ☐ Generally characteristic
- ☐ Extremely characteristic

2. I'm concerned about my style of doing things.

- ☐ Extremely uncharacteristic
- ☐ Generally uncharacteristic
- ☐ Equally characteristic and uncharacteristic
- ☐ Generally characteristic
- ☐ Extremely characteristic

3. Generally, I'm not very aware of myself.

- ☐ Extremely uncharacteristic
- ☐ Generally uncharacteristic
- ☐ Equally characteristic and uncharacteristic
- ☐ Generally characteristic
- ☐ Extremely characteristic

4. It takes me time to overcome my shyness in new situations.

- ⊙ Extremely uncharacteristic
- ⊙ Generally uncharacteristic
- ⊙ Equally characteristic and uncharacteristic
- ⊙ Generally characteristic
- ⊙ Extremely characteristic

5. I reflect about myself a lot.

- ⊙ Extremely uncharacteristic
- ⊙ Generally uncharacteristic
- ⊙ Equally characteristic and uncharacteristic
- ⊙ Generally characteristic
- ⊙ Extremely characteristic

6. I'm concerned about the way I present myself.

- ⊙ Extremely uncharacteristic
- ⊙ Generally uncharacteristic
- ⊙ Equally characteristic and uncharacteristic
- ⊙ Generally characteristic
- ⊙ Extremely characteristic

7. I'm often the subject of my own fantasies.

- ⊙ Extremely uncharacteristic
- ⊙ Generally uncharacteristic
- ⊙ Equally characteristic and uncharacteristic
- ⊙ Generally characteristic
- ⊙ Extremely characteristic

8. I have trouble working when someone is watching me.

☐   Extremely uncharacteristic

☐   Generally uncharacteristic

☐   Equally characteristic and uncharacteristic

☐   Generally characteristic

☐   Extremely characteristic

9. I never scrutinize myself.

☐   Extremely uncharacteristic

☐   Generally uncharacteristic

☐   Equally characteristic and uncharacteristic

☐   Generally characteristic

☐   Extremely characteristic

10. I get embarrassed very easily.

☐   Extremely uncharacteristic

☐   Generally uncharacteristic

☐   Equally characteristic and uncharacteristic

☐   Generally characteristic

☐   Extremely characteristic

11. I'm self-conscious about the way I look.

☐   Extremely uncharacteristic

☐   Generally uncharacteristic

☐   Equally characteristic and uncharacteristic

☐   Generally characteristic

☐   Extremely characteristic

12. I don't find it hard to talk to strangers.

- ☐ Extremely uncharacteristic
- ☐ Generally uncharacteristic
- ☐ Equally characteristic and uncharacteristic
- ☐ Generally characteristic
- ☐ Extremely characteristic

13. I'm generally attentive to my inner feelings.

- ☐ Extremely uncharacteristic
- ☐ Generally uncharacteristic
- ☐ Equally characteristic and uncharacteristic
- ☐ Generally characteristic
- ☐ Extremely characteristic

14. I usually worry about making a good impression.

- ☐ Extremely uncharacteristic
- ☐ Generally uncharacteristic
- ☐ Equally characteristic and uncharacteristic
- ☐ Generally characteristic
- ☐ Extremely characteristic

15. I'm constantly examining my motives.

- ☐ Extremely uncharacteristic
- ☐ Generally uncharacteristic
- ☐ Equally characteristic and uncharacteristic
- ☐ Generally characteristic
- ☐ Extremely characteristic

16. I feel anxious when I speak in front of a group.

- ☐ Extremely uncharacteristic

- Generally uncharacteristic
- Equally characteristic and uncharacteristic
- Generally characteristic
- Extremely characteristic

17. One of the last things I do before I leave the house is look in the mirror.

- Extremely uncharacteristic
- Generally uncharacteristic
- Equally characteristic and uncharacteristic
- Generally characteristic
- Extremely characteristic

18. I sometimes have the feeling that I'm off somewhere watching myself.

- Extremely uncharacteristic
- Generally uncharacteristic
- Equally characteristic and uncharacteristic
- Generally characteristic
- Extremely characteristic

19. I'm concerned about what other people think of me.

- Extremely uncharacteristic
- Generally uncharacteristic
- Equally characteristic and uncharacteristic
- Generally characteristic
- Extremely characteristic

20. I'm alert to changes in my mood.

- Extremely uncharacteristic
- Generally uncharacteristic

- ☐ Equally characteristic and uncharacteristic
- ☐ Generally characteristic
- ☐ Extremely characteristic

21. I'm usually aware of my appearance.

- ☐ Extremely uncharacteristic
- ☐ Generally uncharacteristic
- ☐ Equally characteristic and uncharacteristic
- ☐ Generally characteristic
- ☐ Extremely characteristic

22. I'm aware of the way my mind works when I work through a problem.

- ☐ Extremely uncharacteristic
- ☐ Generally uncharacteristic
- ☐ Equally characteristic and uncharacteristic
- ☐ Generally characteristic
- ☐ Extremely characteristic

23. Large groups make me nervous.

- ☐ Extremely uncharacteristic
- ☐ Generally uncharacteristic
- ☐ Equally characteristic and uncharacteristic
- ☐ Generally characteristic
- ☐ Extremely characteristic