

EMOTIONALLY MOTIVATED BEHAVIOR AND PERSONALITY AMONG WOMEN  
WITH BULIMIA NERVOSA

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## **ABSTRACT**

LISA BROWNSTONE: Emotionally Motivated Behavior and Personality Among  
Women with Bulimia Nervosa  
(Under the direction of Anna Bardone-Cone)

The current study examines ways in which personality may account for frequency and variability of emotionally motivated behaviors among individuals with subthreshold and threshold bulimia nervosa (BN). Personality subtyping studies have consistently recognized categories of over-restricted and dysregulated subtypes of BN. Rather than conceptualizing personality categorically, the current study aims to see how the continuous personality variables of inhibitedness, impulsivity, and emotion dysregulation may interact to identify frequency and variability of emotionally motivated behaviors in a sample of females with bulimic-type eating disorders. All of the behaviors explored in this study (bulimic and non-bulimic comorbid behaviors) are generally considered maladaptive and related to affect regulation. The sample included 204 females with threshold and subthreshold BN who provided self-report data via questionnaires. Results indicated that there was an interaction between emotion dysregulation and inhibitedness in accounting for frequencies of both hard exercise and laxative use. On its own, emotion dysregulation accounted for a significant amount of variance in two of the dependent variables of interest (frequency of subjective binge eating and variability of non-BN behaviors). Impulsivity was also found to account for a significant amount of variance in two of the dependent variables of interest (frequency of laxative use and variability of non-BN behaviors). Future research should continue to

examine correlates and predictors of both frequency and variability of bulimic and non-bulimic emotionally motivated behaviors.

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## **LIST OF ABBREVIATIONS**

AN = Anorexia Nervosa

BIS-11 = Barrett Impulsivity Scale

BN = Bulimia Nervosa

DAPP-BQ = Dimensional Assessment of Personality Problems-Brief Questionnaire

DIRI-RS = Depressive Interpersonal Relationships Inventory-Reassurance Seeking Scale

DMQ = Drinking Motives Questionnaire

DSM-IV = Diagnostic Statistic Manual of Mental Disorders—Fourth Edition

EDE = Eating Disorder Examination

EDE-Q = Eating Disorder Examination Questionnaire

EMA = Ecological Momentary Assessment

IBS = Impulsive Behavior Scale

INHIB = Inhibitedness

Non-BN = Non-Bulimic

NSSI = Non-Suicidal Self Injury

OBE = Objective Binge Eating

SBE = Subjective Binge Eating

SCID-P = The Structured Clinical Interview for DSM-IV, Patient Edition



## I. Introduction

### Emotionally Motivated Behavior and Personality Among Women with Bulimia Nervosa

Binge eating and compensatory behaviors can be understood as physical forms of affect regulation. This conceptualization has been put forth in theoretical and narrative accounts of bulimia nervosa (BN) and tested empirically using multiple research methods, including experiments, ecological momentary assessment (EMA), and retrospective report (Engelberg, Steiger, Gauvin, & Wonderlich, 2007; Fox & Froom, 2009; Moon & Berenbaum, 2009). Most of these studies have focused on the function of the binge eating episode as a maladaptive mode of emotion regulation or as a mode of escape from aversive self awareness (Anestis, Smith, Fink, & Joiner, 2009; Heatherton & Baumeister, 1991).

Far less work has explored the relationship between compensatory behaviors and emotion regulation; however, there is some evidence that purging plays a role in this process. For example, Jeppson, Richards, and Hardman (2003) and Telch (1997) report on qualitative analyses of binge eating and purging as emotion regulation strategies (albeit maladaptive). Excessive exercise has also been conceptualized as a form of affect regulation, particularly among individuals with anorexia nervosa (AN) (Peñas-Lledo, Vaz Leal, & Waller, 2002). As such, both binge eating and compensatory behaviors can be understood as being motivated by a desire to shift emotional experience away from aversive affect, and can therefore be understood as emotionally motivated.

Some individuals with BN engage in a wide variety of potentially emotionally motivated behaviors besides the characteristic bulimic behaviors of binge eating followed by

compensatory behaviors. Such behaviors may include non-suicidal self-injury (NSSI), alcohol/substance abuse, risky sexual behavior, and reassurance seeking. These actions can be categorized similarly to binge eating and compensatory behaviors as being potential responses to aversive emotional experience; as such they can all, at least in part, be understood as emotionally motivated. The current study addresses how the personality traits of inhibitedness and impulsivity in the context of emotion dysregulation affect the frequency and variety of these behaviors (bulimic behaviors and other potentially maladaptive emotionally motivated behaviors) exhibited by individuals with BN.

### **What is meant by “emotionally motivated”?**

It can be argued that all behaviors are emotionally motivated; after all, basic theories of emotion postulate that emotions form the basis of motivational systems (Lang, 1985). This study, however, specifically addresses maladaptive behaviors that may be performed with the intention of regulating emotion in the short term, but that do not provide benefits in the long term. Supporting this idea, Tice, Bratslavsky, and Baumeister (2001) found that when under emotional distress, immediate impulses are prioritized over long-term goals. All of the behaviors investigated in this study are hypothesized to be potentially emotionally motivated behaviors performed with immediate relief as the short-term goal. This relief is likely promoted by a momentary shift from painful self-awareness to more tolerable or preferred bodily sensation and escape (Baumeister, 1988). This same framework has been used broadly to better understand many of the behaviors under consideration in this study, including binge eating, compensatory behaviors, NSSI, alcohol/substance abuse, and risky sexual behavior, all of which involve sought out physical state changes (Baumeister, 1991).

There are, however, other potential functions that binge eating, compensatory behaviors, NSSI, alcohol/substance abuse, risky sexual behavior, and reassurance seeking may serve. For instance, the Drinking Motives Questionnaire (DMQ; Cooper, 1994) includes questions about drinking to cope, but also acknowledges two other categories of motivation for drinking: social and enhancement. Similarly, compensatory behaviors are often viewed as strategic responses following binge eating episodes aimed at weight management or control (Mond, Hay, Rodgers, Owen, & Mitchell, 2006; Thombs, Mahoney, & McLaughlin, 1998). Lacking from this conceptualization, however, is a rationale for the motivation behind the occurrence of purging in the absence of binge eating. While these alternative explanations may be present, I argue that all of these behaviors have an emotional basis, particularly given that we are investigating these behaviors among a sample of women suffering from BN, a group that has consistently demonstrated difficulties with emotion regulation and negative affect (Whiteside et al., 2007).

### **Emotion regulation and non-bulimic behaviors**

NSSI has been consistently understood as a maladaptive form of emotion or affect regulation (Gratz, 2003; Linehan, Heard, & Armstrong, 1993; Suyemoto, 1998). Parasuicidal behaviors have generally been found to be preceded by negative mood and followed by improved mood. This has also been found among individuals with BN who engage in NSSI, perhaps most convincingly in an EMA study, which looked at mood before and after NSSI among a sample of individuals with BN (Muehlenkamp et al., 2009). Franklin et al. (2009) reported that the emotional relief following NSSI coincides with the *removal* of the physically painful stimulus. It does not appear that the reinforcement occurs during the behavior, but rather follows the discontinuation of self-inflicted pain. The nuance of how the

emotional relief operates, therefore, is likely different than how binge eating and compensatory behaviors have been understood in the context of Baumeister's escape theory, which focuses more on the experience of escape during the behavior rather than after its completion. NSSI, however, clearly can be understood as having an emotion regulation component, and as such can be grouped into a larger category of emotionally motivated behavior.

Evidence suggests that motivations for alcohol abuse among individuals with BN may tend to be more related to coping than the other motives included in the DMQ (i.e., social and enhancement) (Luce, Engler, & Crowther, 2007). Accordingly, while other motives can be used to explain motivations for drinking, coping is perhaps the most apparent motivation to drink among individuals with BN. Regarding drug abuse and BN, Carbaugh and Sias (2010) provide a theoretical framework for understanding this comorbid presentation. They assert that bulimic symptoms and drug abuse behaviors both serve a self-medicating purpose in that they act as outlets for aversive affect. There is, therefore, both a theoretical and empirical basis for conceptualizing alcohol and drug abuse among individuals with BN as emotionally motivated.

Including risky sexual behavior in our grouping of emotionally motivated or regulating behaviors is somewhat problematic, because risky sexual behavior is most often understood as a behavior motivated by sensation seeking rather than management of aversive affect (Donohew et al., 2000). This distinction of motivation comes from Whiteside and Lynam's (2001) four-factor model of impulsivity, which presents four motivational factors for impulsive behaviors: urgency, premeditation, lack of perseverance, and sensation seeking. Negative urgency is the tendency to want to alleviate negative affect as quickly as possible.

In contrast, sensation seeking is understood as an approach reaction toward any sort of sensation, most often physical sensation, in such a way that positive experience can be enhanced. In line with this theory, Zapolski, Cyders, and Smith (2009) found that risky sex among college-aged individuals coincided with positive emotional states, and was pursued in an attempt to prolong the positive emotion. The question is whether people with BN have different motivations for behaviors like risky sex than the unselected sample studied by Zapolski et al. (2009).

Some evidence indicates that neurotic individuals are motivated to engage in risky behaviors in order to regulate aversive affect, whereas extraverted individuals are more likely to engage in risky behaviors in order to enhance already present positive affect (Cooper, Agocha, & Sheldon, 2001). This finding supports the likelihood of there being variability in motivations to engage in risky sexual behavior. Baumeister's escape theory has also been applied to problematic sexual behaviors like hypersexuality, which is often accompanied by risky sex (Baumeister, 1991; Bancroft, 2008). Bancroft theorizes that sex may serve as a distraction or escape from negative mood. This idea of risky sex serving an escape function is not necessarily incompatible with the idea that risky sexual behavior might be motivated by sensation seeking. After all, the sensation sought through risky sex may serve a distracting or escape function for an individual. Keeping in mind the nuances and complications associated with grouping risky sexual behavior with these other emotionally motivated behaviors, there appears to be a reasonable rationale for understanding it in this way.

The construct of reassurance seeking, proposed by Joiner, Alfano, and Metalsky (1999), refers to attempts to seek reassurance from interpersonal support networks or individuals. While most work on reassurance seeking has explored its relationship with

depression, some work has explored reassurance seeking as a mode of behavioral dysregulation motivated by aversive affect (Joiner, Katz, & Lew, 1999). This affect regulation framework has been supported by findings of Anestis et al. (2009) in a sample of women with BN that showed a relationship between affect lability and excessive reassurance seeking. In line with this work, we are looking at reassurance seeking as a means of seeking out emotional relief from outside sources—as such we include it in our grouping of emotionally motivated behaviors. However, reassurance seeking, unlike the other behaviors under study in this report, does not lead to direct physical risks or outcomes (e.g., unlike, alcohol or drug use, it does not lead to physiological addiction). Similarly, unlike the other behaviors examined, reassurance seeking does not involve physical or bodily sensation. With these differences in mind, we are exploring excessive reassurance seeking as a potentially emotionally motivated behavior among individuals with BN.

If all of these behaviors have the potential to provide temporary relief from emotional distress, the question becomes: Why do some individuals engage in a wide range of potentially emotionally regulating behaviors while others seem to restrict themselves to a narrow range? It is possible that personality dimensions contribute to the extent to which specific emotionally motivated behaviors are available to individuals. Specific to this study, personality variables may impact whether an individual with BN engages in a restricted range of repeated behaviors or a wide variety of behaviors.

### **Personality and BN**

Personality dimensions may underlie the extent to which an individual is multi-impulsive versus uni-impulsive (Lacey & Evans, 1986). Uni-impulsive describes when individuals engage in the limited range of impulsive behaviors associated with a specific

diagnosis (e.g., someone with BN engaging in binge eating and purging), whereas multi-impulsive describes when individuals engage in a wider range of impulsive behaviors outside the range of a diagnosis (e.g., someone with a substance use disorder who also engages in NSSI and binge eating). Westen and Harnden-Fischer (2001) apply this idea of multi- versus uni- impulsivity to BN as a means of understanding an observable differentiation among individuals with BN: those who engage in a variety of impulsive behaviors and those who are only impulsive in the realm of binge eating and compensatory behaviors.

Along similar lines, studies have consistently found distinct clusters or subtypes of BN based upon symptom ratings, personality variables, and comorbidity that generally differentiate an impulsive subtype from a more restricted and overcontrolled subtype among those with BN (Thompson-Brenner et al., 2008; Westen & Harnden-Fischer, 2001; Wonderlich et al., 2005). Thompson-Brenner et al. (2008) described five personality subtypes of individuals with eating disorders (not just BN): behaviorally dysregulated, emotionally dysregulated, avoidant-insecure, obsessional-sensitive, and high-functioning. Westen and Harnden-Fischer (2001) described three personality subtypes among individuals suffering from AN or BN: emotionally dysregulated/undercontrolled, constricted/overcontrolled, and high-functioning/perfectionistic. Similarly, Wonderlich et al. (2005) described three distinct subtypes of BN: an impulsive group, an affective-perfectionistic group, and a low comorbidity group. The fact that similar personality subtypes pertaining to impulsivity and over-regulation have been observed across studies calls for further exploration of how personality dimensions may be associated not just with eating disorders diagnoses, but with frequency and patterns of behaviors that can be conceptualized as emotionally motivated.

Wonderlich et al. (2005) compared the three subtypes of BN (impulsive, affective-perfectionistic, and low-comorbidity) on both personality dimensions and symptoms. The affective-perfectionistic subtype and impulsive subtype were similarly high on emotion dysregulation, while the affective-perfectionistic subtype had higher levels of inhibitedness (although the difference did not reach significance), and the impulsive subtype had higher levels of dissocial behavior and lower levels of compulsivity. In terms of symptoms, the affective-perfectionistic subtype had higher levels of weight and shape concern but these two subtypes did not differ on restraint or eating concern on the Eating Disorder Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 1993). The current study will look at various dimensional variables related to personality subtyping, namely inhibitedness, impulsivity, and emotion dysregulation, as they relate to patterns of emotionally motivated behaviors. It is thought that how these personality variables combine may give rise to frequencies and variability of such behaviors.

### **The Current Study**

The current study examines the personality constructs of impulsivity and inhibitedness among adult women with subthreshold/threshold BN to examine how these constructs relate to frequency and variety of behaviors hypothesized to be emotionally motivated (e.g., binge eating, compensatory behaviors, NSSI, alcohol/substance abuse, risky sex, and reassurance seeking). More specifically, we test whether individuals show different frequencies and variability of emotionally motivated behaviors depending upon levels of impulsivity and inhibitedness in the context of high emotion dysregulation.

While most eating disorder research focuses on frequencies of eating disorder behaviors as outcomes, work by Haedt, Edler, Heatherton, and Keel (2006) suggests that



variability of these behaviors, specifically purging behaviors, is likely more indicative of eating disorder severity than frequency. Related to variability, it was hypothesized that a three-way interaction between impulsivity, inhibitedness, and emotion dysregulation would be associated with variability of emotionally motivated behaviors. More specifically, we expected that individuals who were high on inhibitedness, low on impulsivity, and high on emotion dysregulation would restrict the variety of emotionally motivated behaviors by resorting to repeated and familiar outlets for emotional relief as opposed to more variable comorbid behaviors, because of a trait tendency toward restriction and caution. On the other hand, we expected that individuals who were high on impulsivity, low on inhibitedness, and high on emotion dysregulation would engage in a higher number of different emotionally motivated behaviors due to less restriction and less aversion to unpredictability of outcome. These patterns were hypothesized to emerge both in bulimic and non-bulimic behavior variability.

It was thought that this higher variability of emotionally motivated behaviors might be accompanied by lower frequencies of specific bulimic behaviors among high impulsive/low inhibitedness individuals, because of a tendency to seek emotional relief from a wide array of behaviors rather than from a smaller range of repeated behaviors. Another possibility, however, was that individuals who tended toward high impulsivity, low inhibitedness, and high emotion dysregulation would not differ in frequency of bulimic behaviors from more inhibited individuals, because of an overall tendency toward behavioral dysregulation that would lead to both high frequencies and variability of these behaviors. In support of this idea, Wiederman and Pryor (1995) found that multi-impulsive versus uni-impulsive individuals with BN do not differ in incidence of bulimic behaviors. On a bivariate

level, we hypothesized that emotion dysregulation would be associated with the frequencies of OBEs and compensatory behaviors, based upon the idea that these behaviors are emotionally motivated. How impulsivity and inhibitedness would relate to frequencies of BN-behaviors, on the other hand, was less clear given the presence of distinct impulsive and overcontrolled groups in this dataset and in the literature in general (Westen & Harnden-Fischer, 2001; Wonderlich et al., 2005); therefore, examination of these constructs was considered exploratory.

## II. Method

Participants included 204 adult women recruited through community advertising and eating disorder clinics in five midwestern cities in 2002-2003. Based upon a telephone interview, 144 (71%) met full diagnostic criteria for BN according to the *Diagnostic and Statistical Manual of Mental Disorders*, 4<sup>th</sup> edition (*DSM-IV*; APA, 1994), and 60 (29%) met criteria for subthreshold BN, defined as (a) objective binge eating and compensatory behavior occurring at least once per week over the past three months, or (b) compensatory behavior occurring at least once per week along with subjective binge eating episodes (i.e., episodes of binge eating that are not objectively large, but do involve loss of control). Individuals with threshold versus subthreshold BN were similar in terms of severity of eating pathology as indicated by similar scores on subscales on the EDE-Q (besides the eating concern subscale) and similar levels of psychiatric comorbidity (Le Grange et al., 2006).

Inclusion criteria included female sex, age range of 18-65 years, and the presence of binge eating and purging behavior. Individuals with current psychotic disturbances, brain injuries or conditions, or the inability to read were excluded from the current study. Mean age of participants was 25.9 years ( $SD = 8.9$  years). The majority of participants were single and had never been married (75%), self-identified as Caucasian ( $n = 185$ , 90.7%; Asian:  $n = 7$ , 3.4%; Black:  $n = 5$ , 2.5%; Hispanic:  $n = 3$ , 1.5%; other races/ethnicities:  $n = 4$ , 2.0%), and had at least some college education (94%). Based upon self-reported weight and height, mean body mass index (BMI) was 22.90 kg/m<sup>2</sup> ( $SD = 5.23$ ).

## **Procedure**

Trained interviewers administered a telephone interview that included the eating disorder module from the Structured Clinical Interview for DSM-IV, Patient Edition (SCID-P; First Spitzer, Gibbon, & Williams, 1995). Interviewers used criteria for binge eating established in the Eating Disorder Examination (EDE; Fairburn & Beglin, 1994) to determine if reported food portions during binges were objectively large in amount. Participants who met current DSM-IV diagnostic criteria for threshold or subthreshold BN provided informed consent, completed a set of questionnaires, and received \$50 compensation for their participation. The Institutional Review Boards at each study site approved this study.

## **Measures**

**The Structured Clinical Interview for DSM-IV, Patient Edition (SCID-P) Eating Disorder Module (First et al., 1995).** The SCID-P is a widely used semi-structured interview that assesses the presence of Axis I disorders. In this study, the eating disorder module of the SCID-P was used during the phone screen in order to determine diagnostic eligibility.

**Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994).** The EDE-Q is a 36-item self-report survey adapted from the Eating Disorder Examination (EDE) interview (Fairburn & Cooper, 1993). In addition to subscale scores related to psychological symptoms of eating disorders (e.g., weight concern), the EDE-Q also includes questions about frequencies of binge eating episodes and compensatory behaviors over the past 28 days. Data on binge eating and compensatory behaviors came from this measure. The EDE-Q differentiates between objective binge eating episodes (OBEs) and subjective binge eating episodes (SBEs): an OBE is an objectively large amount of food consumed in

combination with loss of control, while an SBE involves loss of control without an objectively large quantity of food consumed. The compensatory behaviors assessed included the purging behaviors of self-induced vomiting, laxative use, and diuretics use, as well as excessive exercise. Construct validity has been demonstrated by high correlations between the EDE-Q and the EDE subscales ranging from 0.78 to 0.85 (Fairburn & Beglin, 1994). There is some indication that the EDE-Q has adequate test-retest reliability for the assessment of OBEs ( $r = .84$ ), but not for the assessment of SBEs ( $r = .39-.51$ ) (Reas, Grilo, & Masheb, 2006).

**Dimensional Assessment of Personality Problems—Basic Questionnaire (DAPP-BQ; Livesley, Jackson, & Schroeder, 1992).** The DAPP-BQ is a 290-item self-report questionnaire with four higher-order factors: inhibitedness, emotion dysregulation, dissocial behavior, and compulsivity. For the purposes of this study, inhibitedness and emotion dysregulation were explored using the DAPP-BQ. As assessed in this measure, inhibitedness reflects level of introversion and interpersonal difficulties, while emotion dysregulation reflects trait level unstable affect, cognitive dysregulation, anxiousness, and identity problems (Livesley & Larstone, 2008). The DAPP-BQ has acceptable psychometric properties with internal consistency coefficients ranging from 0.83 to 0.94, and test-retest reliability over a 3-week period from 0.81 to 0.93. (Livesley et al., 1992). Good validity has been demonstrated by high convergence between the DAPP-BQ and the Schedule for Nonadaptive and Adaptive Personality (SNAP; Clark, 1993), in addition to agreement between the primary traits of personality disorder with scores on the DAPP-BQ (Harkness, 1992).

**Barratt Impulsivity Scale (BIS-11; Barratt, 1959).** Impulsivity is often examined on a behavioral level; however, the current study focused on impulsivity as a characterological and dimensional variable. In particular, we conceptualized impulsivity as involving the extent to which people have control over thoughts and behaviors (Barratt, 1972). As such, we used the BIS-11, which is a 30-item scale measuring various elements of trait impulsivity. The measure includes three subscales: attentional, motor, and non-planning. The total score can be interpreted as a measure of general impulsivity, and this is what will be used in the current study. A recent study of the BIS-11 found satisfactory internal consistency and test-retest reliability for a non-clinical sample with Cronbach's alpha of 0.83 (Stanford et al., 2009). Validity of the BIS-11 has been demonstrated by clear differences in scores on the BIS-11 between healthy controls and individuals with current drug abuse; this indicates a relationship between scores on the measure and observable behavior (Allen, Moeller, Rhoades, & Cherek, 1998). The alpha for the BIS-11 in the current study was 0.85.

**Impulsivity Behavior Scale (IBS; Rossotto, Yager, & Rorty, 1994).** The IBS is a 25-item self-report questionnaire that assesses the presence of different impulsive and self-destructive behaviors across the lifespan (Rossoto et al., 1994). Relevant to this study is the IBS' assessment of NSSI, alcohol abuse, drug abuse, and risky sexual behavior. Four items providing information about these behaviors were used in this study. These four items were chosen based upon their emphasis on the behavior of interest rather than the severity of problems relating to that behavior. Response scales for each item use a 5-point scale, including *never*, *once*, *on occasion (2-3 times)*, *sometimes (4-20 times)*, and *regularly (20+ times)*. Table 1 includes the items from the IBS that were used to determine non-bulimic

behavior counts for the variability dependent variable (besides reassurance seeking, which was assessed using a different measure).

**Depressive Interpersonal Relationships Inventory-Reassurance Seeking subscale (DIRI-RS; Joiner, Alfano, & Metalsky, 1999).** The DIRI-RS is a four-item scale that measures the degree to which individuals seek reassurance from others using a 7-point Likert response scale. For the purposes of this study, only the first two items of the DIRI-RS were included in the analyses, because these items focus on the behavioral aspect of reassurance seeking, whereas the other two items focus on the interpersonal effects of reassurance seeking. Namely, the items included were: “In general, do you find yourself often asking the people you feel close to how they truly feel about you?” and “In general, do you frequently seek reassurance from the people you feel close to as to whether they really care about you?” Construct validity of the DIRI-RS has been demonstrated by moderate correlations between behavioral ratings of reassurance seeking behaviors and scores on the DIRI-RS ranging from 0.37 to 0.43 (Joiner & Metalsky, 2001). The alpha coefficient for the DIRI-RS in this sample was 0.92.

### **Data Analytic Plan**

**Overview and Preliminary Analyses.** The means and standard deviations were computed for all of the study variables and the data were examined for outliers. The bivariate associations among the variables were examined using Pearson correlations. The independent variables in this study were the personality variables of emotion dysregulation, impulsivity, and inhibitedness. The dependent variables were categorized into two separate constructs: frequencies of behaviors and variability of behaviors. Analyses involved testing the three-way interactions between emotion dysregulation, impulsivity, and inhibitedness in

identifying: (1) frequencies of bulimic behaviors, (2) variability of bulimic behaviors, and (3) variability of non-bulimic emotionally motivated behaviors. Power to detect a three-way interaction with a sample of 204 women was low; however, a theoretically derived three-way interaction had been found within this dataset previously (Bardone-Cone et al., 2008).

**Frequencies of specific bulimic behaviors.** Frequencies of bulimic behaviors were measured using the EDE-Q, which gathers information from the prior 28 days about the number of OBEs and SBEs, as well as the number of episodes of vomiting, laxative use, diuretic use, and excessive exercise. Dependent variables relating to frequencies of bulimic behaviors over the past 28 days included frequency of binge eating episodes (OBEs and SBEs examined separately), frequency of each purging behavior (vomiting, laxative use, and diuretic use), and frequency of excessive exercise.

To test the interaction of emotion dysregulation, impulsivity, and inhibitedness in relation to frequencies of bulimic behaviors, we performed hierarchical multiple regressions with the following order of variables entered to identify the frequency of each subcategory of bulimic behaviors over the past 28 days: Step 1 – emotion dysregulation, impulsivity, and inhibitedness; Step 2 - two-way interactions of emotion dysregulation x impulsivity, emotion dysregulation x inhibitedness, and impulsivity x inhibitedness; Step 3 – three-way interaction of emotion dysregulation x impulsivity x inhibitedness. Interaction terms were created by multiplying the continuous values of emotion dysregulation, impulsivity, and inhibitedness after they had been centered (Frazier, Tix, & Barron, 2004). If no significant three-way interaction emerged, we examined the two-way interactions with particular interest in interactions between emotion dysregulation and impulsivity, and emotion dysregulation and inhibitedness.



**Variability of behaviors (bulimic and non-bulimic).** Variability of bulimic behaviors engaged in was explored by counting how many different bulimic behaviors were endorsed over the past month including binge eating (OBE and SBE, examined separately) and different types of compensatory behaviors. Therefore, the maximum possible count of BN behavior variability was six (i.e., OBE, SBE, vomiting, laxative use, diuretic use, and excessive exercise). Since the time frame for reporting these behaviors was over the past month, even a frequency of once (e.g., one use of laxatives) would count toward number of bulimic behaviors engaged in.

Variability of non-bulimic emotionally motivated behaviors was ascertained by counting the number of different behaviors engaged in according to the IBS and DIRI-RS. Therefore, the maximum possible count of non-bulimic behavior variability was five (i.e., NSSI, alcohol abuse, drug abuse, risky sex, and reassurance seeking). It was necessary to set a threshold at which a response on the IBS and DIRI-RS indicated a count in our variability variable.<sup>1</sup> We used two different thresholds at which we counted responses toward variability: a higher and lower threshold.

For the higher threshold system, variability of non-bulimic behaviors involved counting non-BN behaviors toward variability if they were reported as having been engaged in at least “sometimes (4-20 times)” for alcohol abuse, drug abuse, and risky sex; at least “on occasion (2-3 times)” for NSSI; and at least 6 on a 7-point response scale (reflecting at least “yes, quite often”) on at least one of the two reassurance seeking items of interest. We set the threshold for inclusion toward variability count lower for NSSI due to the higher medical

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<sup>1</sup> The IBS (explicitly) and DIRI-RS (implicitly) ask for lifetime history of various behaviors. As such, both measures have different time frames than the EDE-Q, which asks about the past 28 days. For the higher threshold count system, thresholds for variability counts were set conservatively high in an effort to maximize the probability that the behaviors coincided with bulimic behaviors reported on in the EDE-Q.

severity of that behavior in comparison to the others. This higher threshold system for counts was intended to be strict enough to imply that the participant had engaged in that behavior with some regularity.

For the lower threshold system, variability of non-bulimic behaviors involved counting non-BN behaviors toward variability if they were reported as having been engaged in at least “once” for risky sex, drug abuse, and NSSI; at least “on occasion” for alcohol; and at least “yes, somewhat” on at least one of the two reassurance seeking items. We included this alternative system for counting variability, because of the lack of empirical basis to choose one count system over another. Also, using a lower threshold yielded a greater likelihood of more individuals reporting experience with these non-BN behaviors. The interactive hypotheses related to variability were tested using the same hierarchical multiple regression approach described for the frequencies analyses. We examined both variability of the BN and non-BN behaviors, separately, as dependent variables.

### III. Results

#### Descriptive statistics

Means and standard deviations for all of the continuous study variables, including scores on personality dimensions and frequencies of bulimic behaviors are presented in Table 2. Correlations between the personality dimensions, BN behavior frequencies, and presence of non-BN behaviors (using the higher threshold for presence) are presented in Table 3. Additionally, correlations between variability of bulimic and non-bulimic behaviors (using both variability thresholds) and personality dimensions are presented in Table 4. Of note, BN behavior variability was not significantly correlated with non-BN behavior variability ( $r = .05$  and  $r = .09$  for higher and lower thresholds for counts, respectively).

Examining Table 3, the significant positive correlation between emotion dysregulation and impulsivity ( $r = .33$ ) is not surprising given the theoretical connection between emotion regulation and behavioral disinhibition, which is a large component of impulsivity (Hinshaw, 2003). The current study also observed a significant positive correlation between frequency of SBEs and level of emotion dysregulation ( $r = .17$ ), but surprisingly did not observe a significant correlation between frequency of OBEs and emotion dysregulation. The majority of work that has examined the relation between binge eating and emotion regulation has not teased apart SBEs from OBEs in their discussion of binge eating (Clyne & Blampeid, 2004; Safer, Telch, & Agras, 2001); therefore, to the author's knowledge, no work has specifically explored SBEs (distinct from OBEs) in relation to emotion regulation. A significant positive correlation was also observed between number

of SBEs and OBEs ( $r = .45$ ) suggesting that when an individual's frequency of SBEs is high, her frequency of OBEs is also high; this relation was stronger than that found by Latner, Hildebrandt, Rosewall, Chisholm, and Hayashi (2007) ( $r = .22, p = .052$ ). A significant positive correlation was also observed between risky sexual behavior and vomiting frequency ( $r = .15$ ), suggesting that the two behaviors may involve similar pathways or be related to one another. Given that the higher order factors of the DAPP have been found to be distinct, it is not unexpected that no significant correlation was found between emotion dysregulation and inhibitedness (Livesley & Larstone, 2008).

Examining Table 4, significant positive correlations were observed between emotion dysregulation and non-BN behavior variability (both at the higher and lower thresholds for counts of these behaviors toward variability scores) but not between emotion dysregulation and BN behavior variability. Similarly, significant positive correlations were also observed between impulsivity and both thresholds of the non-BN behavior variability, but not BN behavior variability.

### **Frequencies of bulimic behaviors**

**Objective binge eating.** With frequency of OBEs over the past 28 days as the dependent variable, the three-way interaction of emotion dysregulation, impulsivity, and inhibitedness was not significant,  $t(195) = -.37, p = .709$  (see Table 5).

**Subjective binge eating.** With frequency of SBEs over the past 28 days as the dependent variable, the three-way interaction of emotion dysregulation, impulsivity, and inhibitedness was marginally significant,  $t(195) = 1.83, p = .068$  (see Table 6). See Figure 1 for a graphical representation of this marginally significant three-way interaction. For all figures, high and low levels of the independent variables were determined by one standard

deviation above and below the mean, respectively.

**Hard exercise.** With frequency of hard exercise episodes over the past 28 days as the dependent variable, the three-way interaction of emotion dysregulation, impulsivity, and inhibitedness was not significant,  $t(195) = .37, p = .714$  (see Table 7). However, the two-way interaction between emotion dysregulation and inhibitedness was significant within the set of two-way interactions and was examined separately,  $\beta = .20, t(199) = 2.91, p = .004$ .<sup>2</sup> As depicted in Figure 2, those with high levels of emotion dysregulation who also had high levels of inhibitedness had a higher frequency of hard exercise episodes than those with high emotion dysregulation and low inhibitedness. Simple slope analyses indicated that inhibitedness was significantly associated with hard exercise at both high levels of emotion dysregulation (1 SD above the mean),  $\beta = .23, t(199) = 2.28, p = .024$ , and low levels of emotion dysregulation (1 SD below the mean),  $\beta = -.23, t(199) = -2.10, p = .037$ , but in different directions.

**Vomiting episodes.** With frequency of vomiting episodes over the past 28 days as the dependent variable, the three-way interaction between emotion dysregulation, impulsivity, and inhibitedness was not significant,  $t(194) = 1.19, p = .236$  (see Table 8).

**Laxative use episodes.** With frequency of laxative use episodes over the past 28 days as the dependent variable, the three-way interaction between emotion dysregulation, impulsivity, and inhibitedness was not significant,  $t(195) = -.50, p = .617$  (see Table 9). However, the two-way interaction between emotion dysregulation and inhibitedness was significant within the set of two-way interactions and was examined separately,  $\beta = -.22$ ,

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<sup>2</sup> Of note, we also ran the hierarchical multiple regression excluding those who reported zero hard exercise episodes in the past 28 days (leaving  $n = 106$ ). The emotion dysregulation x inhibitedness interaction was still significant in identifying frequency of hard exercise episodes,  $t(102) = 2.65, p = .009$ . Those with high levels of emotion dysregulation and high levels of inhibitedness engaged in more hard exercise than those with high emotion dysregulation and low inhibitedness.

$t(199) = -2.20, p = .029$ . As depicted in Figure 3, those with low levels of emotion dysregulation and high levels of inhibitedness had higher levels of laxative use than those with low emotion dysregulation and low inhibitedness. On the other hand, at high levels of emotion dysregulation, level of inhibitedness did not appear to have the same impact on the level of laxative use. Furthermore, simple slope analyses indicated that inhibitedness was significantly associated with laxative use at low levels of emotion dysregulation,  $\beta = .30, t(199) = 2.91, p = .004$ , but not at high levels of emotion dysregulation,  $\beta = -.03, t(199) = -.26, p = .792$ .<sup>3</sup>

Additionally, we followed up on the significant two-way interaction between emotion dysregulation and impulsivity found in the set of 2-way interactions, but when examined separately, the 2-way interaction was only marginally significant,  $t(199) = -1.90, p = .060$ , thus further simple slope analyses were not performed.

**Diuretic use episodes.** With frequency of diuretic use episodes over the past 28 days as the dependent variable, the three-way interaction between emotion dysregulation, impulsivity, and inhibitedness was not significant,  $t(194) = -.01, p = .992$  (see Table 10).

### **Variability of Bulimic and Non-Bulimic Behaviors**

**Variability of bulimic behaviors.** With variability of bulimic behaviors over the past 28 days as the dependent variable, the three-way interaction between emotion dysregulation, impulsivity, and inhibitedness was not significant,  $t(194) = -.34, p = .731$  (see Table 11).

**Variability of non-bulimic behaviors.** With variability of non-bulimic behaviors using the higher threshold system as the dependent variable, the three-way interaction

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<sup>3</sup> Of note, we also ran the hierarchical multiple regression excluding those who reported zero laxative use episodes in the past 28 days (leaving  $n = 55$ ). The emotion dysregulation x inhibitedness interaction was no longer significant in identifying frequency of laxative use likely due to low power,  $t(53) = -1.59, p = .117$ .

between emotion dysregulation, impulsivity, and inhibitedness was not significant,  $t(194) = 1.03, p = .306$  (see Table 12). Similarly, with variability of non-bulimic behaviors over the past 28 days using the lower threshold system as the dependent variable, the three-way interaction between emotion dysregulation, impulsivity, and inhibitedness was not significant,  $t(194) = .69, p = .490$  (see Table 13).

#### **IV. Discussion**

Findings from the current study indicate that the three personality variables of interest (emotion dysregulation, impulsivity, and inhibitedness) have differing relationships with frequencies of BN behaviors and emotionally motivated behavior variability. For example, emotion dysregulation was significantly correlated with number of SBEs, but not with frequencies of other BN behaviors, while impulsivity was significantly correlated with frequency of laxative use episodes, but not with frequencies of other BN behaviors. Both emotion dysregulation and impulsivity were positively associated with variability of non-BN behavior, but not with variability of BN behaviors. Inhibitedness, on its own, was not correlated with any BN behavior frequencies or the behavior variability counts. On the other hand, two 2-way interactions emerged involving inhibitedness. In particular, inhibitedness interacted with emotion dysregulation to identify frequencies of hard exercises and laxative use episodes.

None of the three-way interactions between emotion dysregulation, impulsivity, and inhibitedness were found to be statistically significant; however, the three-way interaction with frequency of SBEs as the dependent variable was found to be marginally significant. Interpretation of this three-way interaction proved difficult. The main effect of emotion dysregulation was such that those high in emotion dysregulation engaged in higher frequencies of SBEs overall than those with low emotion dysregulation. Among those with high emotion dysregulation, there were higher frequencies of SBEs among those high in impulsivity than those low in impulsivity, and level of inhibitedness did not appear to affect



frequency of SBEs. Surprisingly, among those with low emotion dysregulation, the number of SBEs appeared to be highest among those low in both impulsivity and inhibitedness. Simple slope analyses were not completed, because of the marginal significance of the 3-way interaction; here the focus is on describing the interaction.

Given the extensive literature on binge eating as an emotion regulation strategy, it is surprising that emotion dysregulation did not have a significant main effect on number of OBEs, but did have a significant main effect on number of SBEs. This finding suggests that OBEs and SBEs may have different behavioral functions for the individual. It is possible that the OBE is more related to momentary negative affect than trait-level emotion dysregulation, whereas the SBE may be the *result* of trait-level high emotion dysregulation as it is assessed in the current study. This conceptualization would imply that OBEs may be, in the short term, functional behaviors aimed at regulating momentary aversive states, while SBEs may be markers of overall dysregulated affect. This interpretation is merely suggested by the results presented in the current paper; however, further research is needed to explore potential functional differences of SBEs versus OBEs among individuals with subthreshold/threshold BN.

We found that inhibitedness interacted with emotion regulation to identify frequency of hard exercise episodes, such that the combination of high inhibitedness and high emotion dysregulation indicated the highest number of hard exercise episodes over the past 28 days. This provides some evidence that perhaps hard exercise is more readily used among individuals who tend to have difficulty with social connection and interpersonal sharing combined with dysregulated emotional states. These individuals may manage difficult emotions via the use of hard exercise. On the other hand, individuals who are low on

inhibitedness and high on emotion dysregulation may have more potential outlets for expressing and regulating affect interpersonally due to not having as many difficulties with social connection and expression than those who are high on inhibitedness.

The significant two-way interaction between emotion dysregulation and inhibitedness with frequency of laxative use episodes as the dependent variable is difficult to interpret. For those high in emotion dysregulation, inhibitedness did not appear to be related to the number of laxative use episodes, whereas for those low in emotion dysregulation, higher inhibitedness was associated with more frequent laxative use episodes. This suggests that, among individuals low in emotion dysregulation, laxative use may be more related to interpersonal and expressivity difficulties; whereas, for those high in emotion dysregulation, laxative use may not be related to these same difficulties. This interpretation is very much tentative, and we suggest further research in this area to better understand the correlates of laxative use in this population.

The observed positive correlations between reassurance seeking and emotion dysregulation, impulsivity, NSSI, and risky sexual behavior are of particular interest, because, to the author's knowledge, little prior work has explored relations between reassurance seeking and these variables. Anestis et al. (2009), using this same sample, found that affect lability (a component of emotion dysregulation) predicted reassurance seeking, which may explain some of the correlation between emotion dysregulation and reassurance seeking. Both number of OBEs and SBEs were positively correlated with vomiting episodes (.63 and .56, respectively). This finding highlights the clinical significance of SBEs, because it suggests that SBEs (like OBEs) may be related to vomiting occurrence.

The lack of significant findings related to variability of bulimic behaviors highlights

the need for novel research designs to better understand the mechanisms associated with variability of these behaviors. This is especially important since prior research indicates that variability in purging behaviors is associated with greater severity of symptoms (Haedt et al., 2006). Regarding the interactive models with non-BN behavior variability, we found that for both higher and lower threshold counts toward variability, emotion dysregulation and impulsivity had main effects, such that higher levels of each were associated with greater variability. For the lower threshold count variability, inhibitedness had a main effect as well but in the opposite direction, which is somewhat related to the hypothesis: higher levels of inhibitedness were associated with lower variability. These findings suggest independent effects of each of these personality variables on variability of non-BN behaviors. It is interesting that inhibitedness only had a main effect in the lower threshold system for counts, such that more inhibitedness indicated lower variability of non-BN emotionally motivated behaviors.

### **Strengths and Limitations**

The use of a clinical sample, subthreshold cases, and multiple sites of data collection of BN were all strengths of the present study. The use of a clinical sample allowed us to better understand how these behaviors and personality dimensions operate among the clinical population of interest: individuals with subthreshold/threshold BN. Additionally, the inclusion of subthreshold cases increased the clinical diversity of the sample and generalizability of the findings. Multiple sites of data collection further increased the generalizability of the study by introducing additional geographic diversity to the sample.

Regarding limitations, one limitation is the use of the EDE-Q, which does not appear to assess SBEs as well as OBEs (Reas, Grilo, & Masheb, 2006). This is likely due to the self-

report nature of the EDE-Q, which requires participants to make a judgment call as to whether or not the binge eating episode was objectively large without the assistance of a trained interviewer. Additionally, given the interest in frequencies of various bulimic behaviors, it may have been helpful to use a real-time data collection mechanism. This would likely have produced more accurate frequency reporting by avoiding retrospective recall bias. Another limitation was the reliance on the IBS to determine counts of non-BN behaviors toward variability. This measure asked about these behaviors across the lifespan rather than over the past 28 days, making it difficult to compare variability findings related to non-BN versus BN behaviors. Additionally, the cross-sectional design does not allow for inference about causation of behaviors. Future studies interested in prediction of frequencies and variability of behaviors would benefit from using experience sampling methodology or longitudinal designs to infer causation.

### **Clinical Implications**

The current study emphasizes the role of personality in frequency of BN behavior and variability of both BN and non-BN behavior. Specific to hard exercise, clinicians might be able to facilitate reduction of hard exercise by improving interpersonal effectiveness and expressivity (i.e., decreasing inhibitedness) among those who are high in emotion dysregulation. The positive correlation between risky sexual behavior and vomiting suggests that clinicians should be attuned to the possible co-occurrence of these behaviors. The observed relation between trait-level emotion dysregulation and SBE occurrence suggests that clinicians may be able to target SBEs in treatment by focusing on emotion regulation skills.

## **Future Directions**

The current study begins to shed light on some of the factors that may explain frequencies and variability of BN and non-BN emotionally motivated behaviors. Given the current study's finding that SBEs were related to emotion dysregulation, future research could further explore the role of affect regulation in SBEs and how the function of SBEs may differ from that of OBEs. Future research could also examine novel constructs that may be related to BN behavior variability, such as negative affect, negative urgency, compulsivity, diagnostic comorbidity, anxiety, perfectionism, and age. For example, individuals who are high in compulsivity and anxiety may be more likely to engage in a smaller range of these behaviors due to a preference for the predictability of the effects of such behaviors.

Additionally, it would be interesting to continue to examine the role of social inhibitedness in the development and maintenance of hard exercise and laxative use. This research should use a more clearly defined construct of inhibitedness than appears in the DAPP that focuses directly on emotional expressivity and interpersonal connectedness without inclusion of broader interpersonal constructs like insecure attachment and social avoidance. Real time data collection could also be used to see how trait-like personality dimensions combine with more momentary variables like affect and cognitions in relation to emotionally motivated maladaptive behavior frequencies and variability.

## **Conclusions**

The current study begins to shed light on some of the ways that these personality factors (emotion dysregulation, impulsivity, and inhibitedness) are related to frequencies and variability of emotionally motivated behaviors among females with subthreshold/threshold BN. It appears that emotion dysregulation and social inhibitedness interacted to identify

frequencies of two behaviors of interest: hard exercise and laxative use. Possible functional differences between OBEs and SBEs were also found. Further research on novel personality variables and affect is encouraged in order to increase our understanding of factors that may be related to frequencies and variability of BN and non-BN comorbid behaviors in samples with bulimic symptomatology.

Table 1

*Items from the Impulsivity Behavior Scale (IBS) Included in the Count of Each Non-bulimic Behavior for the Variability Dependent Variable*

Behavior	IBS Question
NSSI	Have you self-mutilated (e.g., cutting, pinching, burning yourself)?
Alcohol Abuse	Have you had times when you consumed too much alcohol for your own good?
Drug Abuse	Have you had times when you've taken too many recreational drugs?
Risky Sex	Have you been sexually "promiscuous"?

Table 2

*Means and Standard Deviations of Continuous Independent and Dependent Variables*

Variable	Means and Standard Deviations	Observed Range
1. Emotion Dysregulation	$M = 398.75$ $SD = 51.03$	249-503
2. Inhibitedness	$M = 57.10$ $SD = 22.29$	3-118
3. Impulsivity	$M = 71.25$ $SD = 11.46$	47-111
4. OBE	$M = 15.75$ $SD = 23.56$	0-200
5. SBE	$M = 12.91$ $SD = 14.46$	0-100
6. Hard Exercise	$M = 6.89$ $SD = 10.75$	0-84
7. Vomiting	$M = 22.45$ $SD = 36.38$	0-300
8. Laxative use	$M = 2.75$ $SD = 6.27$	0-28
9. Diuretic use	$M = 1.12$ $SD = 5.08$	0-50
10. Variability of BN Behaviors	$M = 3.45$ $SD = 1.14$	0-6
11. Variability of Non-BN Behaviors (Higher Threshold)	$M = 1.53$ $SD = 1.20$	0-5
12. Variability of Non-BN Behaviors (Lower Threshold)	$M = 2.68$ $SD = 1.28$	0-5

*Note.* OBE = objective binge eating episode. SBE = subjective binge eating episode. BN = bulimia nervosa. Variables 4 through 9 indicate the number of episodes of that particular bulimic behavior over the past 28 days. Variability of Non-BN Behaviors (Higher Threshold) involved counting non-BN behaviors toward variability when alcohol abuse, drug abuse, and risky sex were reported as being engaged in at least “sometimes,” when NSSI was reported as being engaged in at least “on occasion,” and reassurance seeking levels were at least 6 on a 7-point response scale on at least one of the two reassurance seeking items of interest. Variability of Non-BN Behaviors (Lower Threshold) involved counting non-BN behaviors toward variability if they were reported as having been engaged in at least “once” for NSSI, drug abuse, and risky sex, at least “on occasion” for alcohol, and at least a 5 out of 7 on at least one of the two reassurance seeking items of interest.



Table 3  
*Correlations Among the Personality Dimensions and the BN Frequency Variables and the Presence of Non-BN Emotionally Motivated Behaviors (N = 204)*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Emotion Dysregulation	-													
2. Inhibitedness	.09	-												
3. Impulsivity	.33 ***	.03	-											
4. OBE	.02	-	.09	-										
5. SBE	.17 *	-	.09	.45 ***	-									
6. Hard Exercise	.12	.03	-	-	.01	-								
7. Vomiting	-	-	.10	.63 ***	.56 ***	-	-							
8. Laxative Use	.07	.10	.19 **	.11	.02	-	.01	-						
9. Diuretic Use	.02	-	.05	-	.14	.11	-	.13	-					
10. NSSI	.21 **	.13	.18 **	.13	.11	.00	.07	.09	-	-				
11. Alcohol Abuse	.01	.04	.12	-	-	-	-	-	.01	.18 **	-			
12. Drug Abuse	-	-	.17 *	.03	.01	-	.01	.02	.05	.28 ***	.33 ***	-		
13. Risky Sex	-	-	.17 *	.11	.05	-	.15 *	-	.00	.12	.29 ***	.41 ***	-	
14. Reassurance Seeking	.41 ***	-	.17 *	.00	.11	.12	-	.05	.06	.14 *	-	-	-	-
		.11	.2				.02				.11	.04	.20 **	

*Note.* In this table, NSSI, alcohol abuse, drug abuse, risky sex, and reassurance seeking presence was ascertained by meeting the higher threshold for the non-BN behavior count variability: alcohol abuse, drug abuse, and risky sex were reported as being engaged in at least “sometimes,” NSSI was reported as being engaged in at least “on occasion,” and reassurance seeking levels were at least 6 on a 7-point response scale on at least one of the two reassurance seeking items of interest. Variables 4 through 9 are all frequency variables, indicating how many times the behavior was engaged in over the past 28 days.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$

Table 4  
*Correlations Among the Personality Dimensions and Variability Variables (N = 204)*

	Emotion Dysregulation	Inhibitedness	Impulsivity
BN Behavior Variability	.09	.07	.08
Non-BN Behavior Variability at Higher Threshold	.22**	-.02	.27***
Non-BN Behavior Variability at Lower Threshold	.28***	-.11	.34***

*Note.* \*\*  $p < .01$ . \*\*\*  $p < .001$

Table 5

*Hierarchical Multiple Regression Analyses of the Interaction of Emotion Dysregulation, Impulsivity, and Inhibitedness with the Dependent Variable of Frequency of Objective Binge Eating*

Step and predictors	B	SE B	$\beta$	$t$ (dfs)	$p$	$\Delta R^2$
Step 1						.01
Emotion Dysregulation	-.003	.04	-.01	-.08 (3,199)	.938	
Impulsivity	.21	.16	.10	1.35 (3,199)	.179	
Inhibitedness	-.05	.08	-.05	-.64 (3,199)	.520	
Step 2						.01
Emotion Dysregulation x Impulsivity	-.003	.003	-.07	-.92 (3,196)	.361	
Emotion Dysregulation x Inhibitedness	.000	.002	.01	.10 (3,196)	.920	
Impulsivity x Inhibitedness	-.004	.01	-.05	-.64 (3,196)	.522	
Step 3						.001
Emotion Dysregulation x Impulsivity x Inhibitedness	-6.17E-5	.000	-.03	-.37 (1,195)	.709	

Table 6

*Hierarchical Multiple Regression Analyses of the Interaction of Emotion Dysregulation, Impulsivity, and Inhibitedness with the Dependent Variable of Frequency of Subjective Binge Eating Episodes*

Step and predictors	B	SE B	$\beta$	$t$ (dfs)	$p$	$\Delta R^2$
Step 1						.04 <sup>^</sup>
Emotion Dysregulation	.05	.02	.18*	2.36 (3,199)	.019	
Impulsivity	.03	.09	.02	.27 (3,199)	.784	
Inhibitedness	-.05	.05	-.08	-1.11 (3,199)	.268	
Step 2						.01
Emotion Dysregulation x Impulsivity	.00	.00	.01	.11 (3,196)	.915	
Emotion Dysregulation x Inhibitedness	.00	.00	.05	.65 (3,196)	.514	
Impulsivity x Inhibitedness	.00	.00	.05	.69 (3,196)	.494	
Step 3						.02 <sup>^</sup>
Emotion Dysregulation x Impulsivity x Inhibitedness	.00	.00	.14 <sup>^</sup>	1.83 (1,195)	.068	

Note. <sup>^</sup>  $p < .10$ . \*  $p < .05$ .

Table 7

*Hierarchical Multiple Regression Analyses of the Interaction of Emotion Dysregulation, Impulsivity, and Inhibitedness with the Dependent Variable of Frequency of Hard Exercise Episodes*

Step and predictors	B	SE B	$\beta$	<i>t</i> (dfs)	<i>p</i>	$\Delta R^2$
Step 1						.02
Emotion Dysregulation	.03	.02	.14 <sup>^</sup>	1.92 (3,199)	.057	
Impulsivity	-.08	.07	-.08	-1.13 (3,199)	.260	
Inhibitedness	.01	.03	.02	.22 (3,199)	.826	
Step 2						.04*
Emotion Dysregulation x Impulsivity	-.00	.00	-.04	-.57 (3,196)	.568	
Emotion Dysregulation x Inhibitedness	.00	.00	.20**	2.73 (3,196)	.007	
Impulsivity x Inhibitedness	-.00	.00	-.03	-.34 (3,196)	.736	
Step 3						.00
Emotion Dysregulation x Impulsivity x Inhibitedness	.00	.00	.03	.37 (1,195)	.714	

Note. <sup>^</sup>  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ .

Table 8

*Hierarchical Multiple Regression Analyses of the Interaction of Emotion Dysregulation, Impulsivity, and Inhibitedness with the Dependent Variable of Frequency of Vomiting Episodes*

Step and predictors	B	SE B	$\beta$	$t$ (dfs)	$p$	$\Delta R^2$
Step 1						.02
Emotion Dysregulation	-.03	.05	-.04	-.56 (3,198)	.574	
Impulsivity	.39	.24	.12	1.62 (3,198)	.107	
Inhibitedness	-.16	.12	-.10	-1.35 (3,198)	.177	
Step 2						.02
Emotion Dysregulation x Impulsivity	-.01	.01	-.11	-1.46 (3,195)	.145	
Emotion Dysregulation x Inhibitedness	-.01	.00	-.13 <sup>^</sup>	-1.78 (3,195)	.077	
Impulsivity x Inhibitedness	.01	.01	.04	.56 (3,195)	.580	
Step 3						.01
Emotion Dysregulation x Impulsivity x Inhibitedness	.00	.00	.09	1.19 (1,194)	.236	

Note. <sup>^</sup>  $p < .10$ .

Table 9

*Hierarchical Multiple Regression Analyses of the Interaction of Emotion Dysregulation, Impulsivity, and Inhibitedness with the Dependent Variable of Frequency of Laxative Use Episodes*

Step and predictors	B	SE B	$\beta$	$t$ (dfs)	$p$	$\Delta R^2$
Step 1						.04*
Emotion Dysregulation	-.00	.01	-.00	-.01 (3,199)	.992	
Impulsivity	.11	.04	.19**	2.63 (3,199)	.009	
Inhibitedness	.02	.02	.07	1.02 (3,199)	.309	
Step 2						.06**
Emotion Dysregulation x Impulsivity	-.00	.00	-.16*	-2.37 (3,196)	.019	
Emotion Dysregulation x Inhibitedness	-.00	.00	-.21**	-2.95 (3,196)	.004	
Impulsivity x Inhibitedness	.00	.00	.12 <sup>^</sup>	1.71 (3,196)	.088	
Step 3						.00
Emotion Dysregulation x Impulsivity x Inhibitedness	-.00	.00	-.04	-.50 (1,195)	.617	

Note. <sup>^</sup>  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ .

Table 10

*Hierarchical Multiple Regression Analyses of the Interaction of Emotion Dysregulation, Impulsivity, and Inhibitedness with the Dependent Variable of Frequency of Diuretic Use Episodes*

Step and predictors	B	SE B	$\beta$	<i>t</i> (dfs)	<i>p</i>	$\Delta R^2$
Step 1						.01
Emotion Dysregulation	.00	.01	.01	.14 (3,198)	.890	
Impulsivity	.02	.03	.05	.69 (3,198)	.493	
Inhibitedness	-.01	.02	-.06	-.77 (3,198)	.441	
Step 2						.01
Emotion Dysregulation x Impulsivity	.00	.00	.01	.16 (3,195)	.872	
Emotion Dysregulation x Inhibitedness	.00	.00	.01	.08 (3,195)	.935	
Impulsivity x Inhibitedness	-.00	.00	-.09	-1.21 (3,195)	.229	
Step 3						.00
Emotion Dysregulation x Impulsivity x Inhibitedness	-.00	.00	-.00	-.01 (1,194)	.992	



Table 11

*Hierarchical Multiple Regression Analyses of the Interaction of Emotion Dysregulation, Impulsivity, and Inhibitedness with the Dependent Variable of Variability of Bulimic Behaviors*

Step and predictors	B	SE B	$\beta$	$t$ (dfs)	$p$	$\Delta R^2$
Step 1						.02
Emotion Dysregulation	.00	.00	.06	.83 (3,198)	.407	
Impulsivity	.01	.01	.07	.98 (3,198)	.327	
Inhibitedness	.00	.00	.06	.82 (3,198)	.414	
Step 2						.01
Emotion Dysregulation x Impulsivity	-.00	.00	-.03	-.41 (3,195)	.683	
Emotion Dysregulation x Inhibitedness	-.00	.00	-.07	-.89 (3,195)	.377	
Impulsivity x Inhibitedness	.00	.00	.03	.42 (3,195)	.678	
Step 3						.00
Emotion Dysregulation x Impulsivity x Inhibitedness	-.00	.00	-.03	-.34 (1, 194)	.731	

Table 12

*Hierarchical Multiple Regression Analyses of the Interaction of Emotion Dysregulation, Impulsivity, and Inhibitedness with the Dependent Variable of Variability of Non-Bulimic Behaviors with the Higher Threshold for Counts*

Step and predictors	B	SE B	$\beta$	$t$ (dfs)	$p$	$\Delta R^2$
Step 1						.10***
Emotion Dysregulation	.004	.002	.16*	2.17 (3,198)	.032	
Impulsivity	.024	.01	.22**	3.10 (3,198)	.002	
Inhibitedness	-.002	.004	-.04	-.60 (3,198)	.550	
Step 2						.01
Emotion Dysregulation x Impulsivity	.00	.00	-.02	.35 (3,195)	.728	
Emotion Dysregulation x Inhibitedness	.00	.00	.13 <sup>^</sup>	1.73 (3,195)	.086	
Impulsivity x Inhibitedness	.00	.00	-.05	-.75 (3,195)	.454	
Step 3						.01
Emotion Dysregulation x Impulsivity x Inhibitedness	.00	.00	.08	1.03 (1,194)	.306	

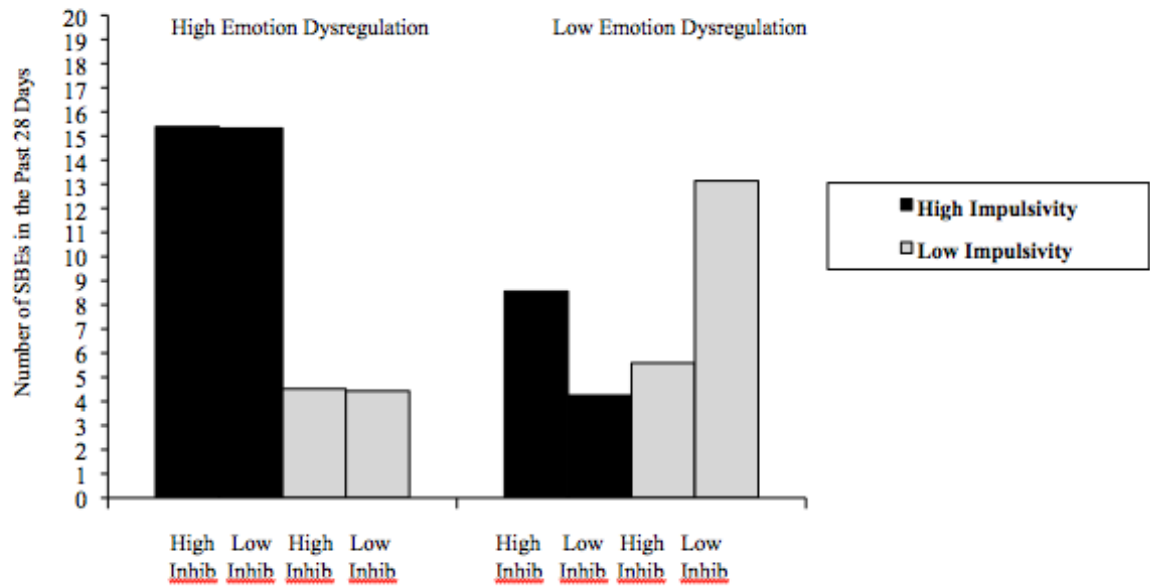
Note. <sup>^</sup>  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Table 13

*Hierarchical Multiple Regression Analyses of the Interaction of Emotion Dysregulation, Impulsivity, and Inhibitedness with the Dependent Variable of Variability of Non-Bulimic Behaviors with the Lower Threshold for Counts*

Step and predictors	B	SE B	$\beta$	$t$ (dfs)	$p$	$\Delta R^2$
Step 1						.17***
Emotion Dysregulation	.01	.00	.21**	2.99 (3,198)	.003	
Impulsivity	.03	.01	.28***	4.02 (3,198)	.000	
Inhibitedness	-.01	.00	-.13*	-2.00 (3,198)	.046	
Step 2						.00
Emotion Dysregulation x Impulsivity	-.00	.00	-.04	-.60 (3,195)	.548	
Emotion Dysregulation x Inhibitedness	-.00	.00	-.06	-.81 (3,195)	.417	
Impulsivity x Inhibitedness	.00	.00	.04	.57 (3,195)	.570	
Step 3						.00
Emotion Dysregulation x Impulsivity x Inhibitedness	.00	.00	.05	.69 (1,194)	.490	

Note. \* $p < .05$ . \*\*  $p < .01$ . \*\*\* $p < .001$ .



*Figure 1.* The three-way interaction of emotion dysregulation, impulsivity, and inhibitedness (Inhib) with the dependent variable of number of subjective binge eating episodes (SBEs) in the past 28 days.

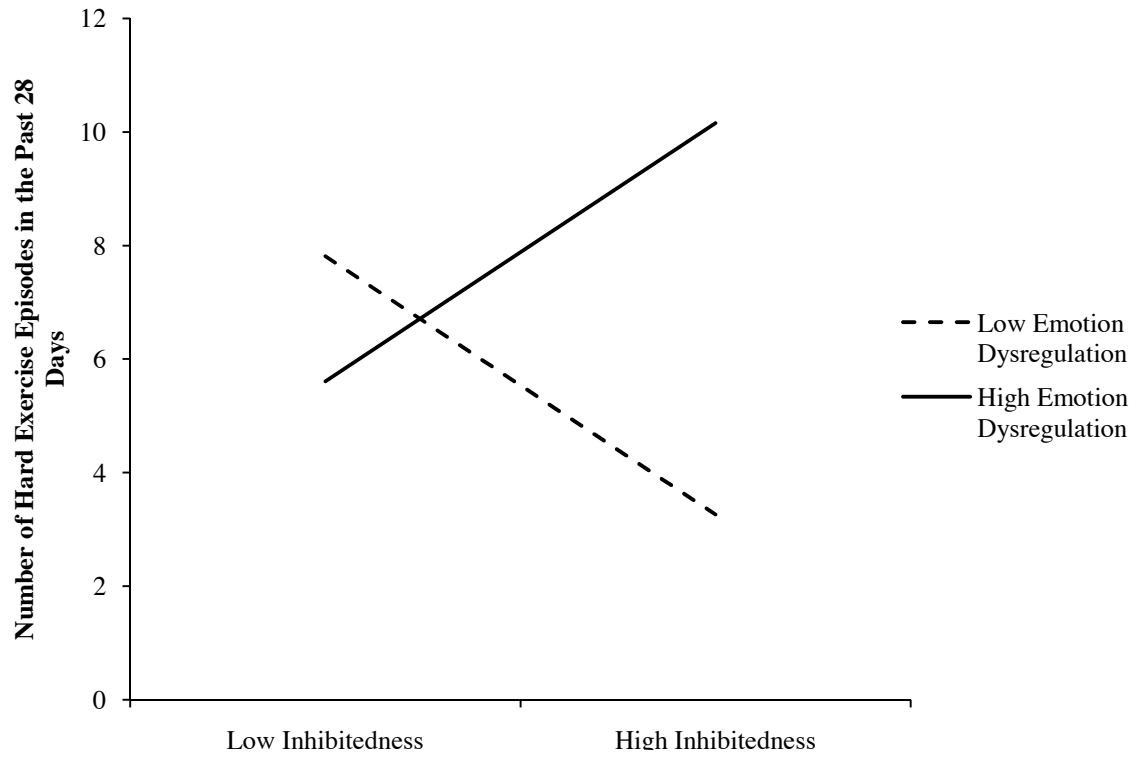


Figure 2. The interaction of emotion dysregulation and inhibitedness with number of hard exercise episodes in the past 28 days as the dependent variable.

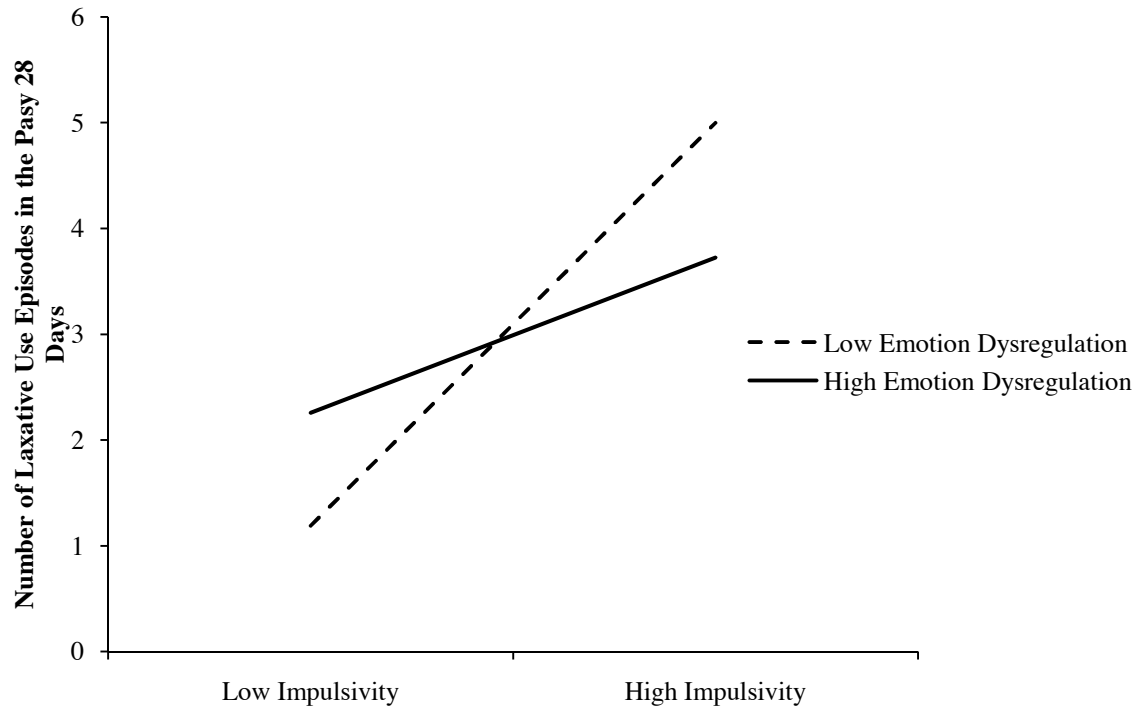


Figure 3. The interaction of emotion dysregulation and inhibitedness with number of laxative use episodes in the past 28 days as the dependent variable.

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