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Binging Behaviors And Emotional Regulation In Young Adults

Michelle Jeanne Duffy

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BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

by

Michelle Jeanne Duffy
Bachelor of Science, Syracuse University, 2017

A Thesis

Submitted to the Graduate Faculty

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for the degree of

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This thesis, submitted by Michelle J. Duffy in partial fulfillment of the requirements for the Degree of Master of Arts from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

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Date

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BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG
ADULTS

Table of Contents

List of Tables.....vi

List of Figures.....vii

Abstract.....viii

Introduction1

 Binge Eating.....2

 Binge Drinking.....3

 Disordered Eating and Substance Use.....4

 Alcohol.....5

 Alcohol with Binge Eating.....7

 Personality Traits.....8

 Emotional Regulation, Coping, and Motivation.....10

The Current Study.....11

Methods.....13

 Participants.....13

 Materials.....14

 Procedure and Statistical Analysis.....18

Results.....20

 Descriptive Statistics.....20

 Preliminary Findings.....20

 MANOVAs.....21

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Drinking Motives Questionnaire.....21

Drunkorexia Motives and Behaviors Scale.....22

Negative Affect.....23

Personality Dimensions.....24

Emotional Regulation.....24

Discussion.....25

 Motivations.....25

 Negative Affect.....31

 Personality Dimensions.....32

 Emotional Regulation.....33

Conclusion and Limitations.....34

References.....37

Appendices.....57

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG
ADULTS

List of Tables

Table 1: <i>Participants Demographics</i>	45
Table 2: <i>Descriptive statistics for all study outcome variables</i>	46
Table 3: <i>Correlations among variables for the DASS questionnaire</i>	47
Table 4: <i>Correlations among emotional regulation variables</i>	48
Table 5: <i>Correlations for variables of the BFI scale</i>	49
Table 6: <i>Differences between binge groups on the DMQ-R subscales</i>	50
Table 7: <i>Differences between binge groups on drunkorexia subscales</i>	51
Table 8: <i>Differences between binge groups on the DASS subscales</i>	52
Table 9: <i>Differences between binge groups on BFI</i>	53
Table 10: <i>Differences between binge groups on the PERCI subscales and BIS-11</i>	54

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG
ADULTS

List of Figures

Figure 1: *DMQ-R mean scores for binge classes*55

Figure 2: *Drunkorexia mean scores for binge classes*56

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Abstract

Co-occurring binge eating and binge drinking is being reported more frequently in college populations and adolescents. Past research has explored various aspects of emotional regulation difficulties in these populations, as well as personality differences, negative affect and various motivations for behaviors. The current study aimed to further explore these differences in individuals who engage in binge eating and drinking separately, comparatively to those who do both binging behaviors. Female undergraduates from a large Mid-Western university (N=127) completed multiple questionnaires regarding eating and drinking behaviors, information regarding their personality traits, emotional regulation difficulties, behavioral motivations and levels of negative affect. Four mutually exclusive groups were created: binge drinking, binge eating, combined binging (both binge eating and binge drinking behavior), and controls. MANOVA and post hoc analyses found similar drinking and drunkorexia motivations for the combined group and binge drinking group, while negative affect of the combined group was more closely related to those in the binge eating group. Additionally, the combined binge group reported the greatest amount of emotional regulation difficulties. Findings suggest that different aspects of the psychopathology for the combined group are shared with binge drinking and binge eating populations separately. This research further emphasizes the need for assessing both binging symptomologies present in individuals simultaneously.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Keywords: binge eating, binge drinking, personality, emotional regulation, motivation

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Binging Behaviors and Emotional Regulation in Young Adults

The act of bingeing is recognized as engaging in excessive consumption in a short period of time and often is marked with feelings of loss of control experienced during the binge episode (Ferriter & Ray, 2011). Additionally, feelings of guilt or remorse accompany most binges, reported both during the behavior and at the conclusion. Binging is most commonly associated with food and/or alcohol. Both binge eating and binge drinking are commonly reported among adolescents and are specifically noted in samples of college students (Rush, Becker, & Curry, 2009). There are numerous health concerns associated with bingeing behaviors including psychological distress and physical harm such as reduced inhibitions, accidents, violent and risky behavior, memory impairment, mood changes and emotional distress, gastrointestinal damage, and increase suicide risk (NIAA, 2004; APA, 2013). Students who engage in both binge drinking and binge eating are assessed at an even higher risks than those who engage in exclusively one behavior or the other (Hunt & Forbush, 2016). As current research is finding higher prevalence rates of these behaviors occurring simultaneously (Ferriter & Ray, 2011; Birch, Stewart, & Brown, 2007; Rush et al., 2009) as well as differences between the genders (Kelly-Weeder, 2009; Rush, Curry, & Looney, 2016; Hunt & Forbush, 2016), the field and future research must now shift towards exploring the possibility of shared etiologies of these bingeing behaviors, and what potential differences might arise between individuals who experience one or the other, and those who experience both. More research must be conducted at both separately occurring binge behaviors and in combined samples to gather additional information regarding the potential similarities in underlying

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

motivations, emotional regulation difficulties, aspects of personality and cognitions that may be indicative of an overall bingeing construct. The findings from this study will have public health and clinical relevance for diagnostics purposes, treatment, and impact on quality of life outcomes for individuals struggling with bingeing behaviors.

Binge Eating

The Diagnostic and Statistical Manual of Mental Disorders (DSM; APA, 2013) criteria for an episode of binge eating is characterized by the over-consumption of food or calories within a two-hour time period that represents an amount that is more than most individuals would eat under similar circumstances. In addition, feelings of loss of control must be experienced during the food consumption. Binge eating is most noted in patients diagnosed with Bulimia Nervosa (BN), Binge Eating Disorder (BED) and the binge/purge subtype of Anorexia Nervosa (AN) (Bello & Hajnal, 2010). Compensatory behaviors used after a binge episode are one of characteristic differences between binge eating occurring in BN populations and BED populations. Individuals suffering from BN will often engage in compensatory behaviors such as purging and skipping a meal to combat the excessive calorie intake that results from a binge. Purging (i.e. self-induced vomiting) is a compensatory action used to eliminate or control caloric intake.

Individuals who purge report higher levels of psychological distress than those with other ED behaviors (Rotella, Mannucci, Gemignani, Lazzeretti, Fioravanti, & Ricca, 2018).

Other compensatory actions are often used as weight loss/control behaviors; they can include restriction of food intake (i.e. skipping a meal) and food-type avoidance behaviors as well (i.e. limiting dessert, avoiding fatty foods). Binge eating research has mostly focused on female samples, but recent studies have continued to find binge eating

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

commonly occurring in males as well (Ferriter & Ray, 2011; Laghi, Liga, Baumgartner, & Baiocco, 2012). Current prevalence rates for BN are 1-1.5% of females, and 1.6% of females for BED (APA, 2013). Current estimates of males are 0.8% for BED and for every 10 females diagnosed with BN, one male is estimated to be diagnosed as well. Disordered eating behaviors (DEB) are another way to assess problematic behaviors in populations without meeting the clinical threshold. These numbers are expected to be higher. Some research has postulated that reduced dopamine functioning in the brain is a risk factor for binge eating, where dopamine levels regulate the reward and motivation processes of food (Luck, Vitatrena, & Wevrick, 2016). Dopamine imbalances or functioning could be a neuro-anatomical explanation for binge eating behavior, where the reward system is unregulated for food consumption. Bello and Hajnal (2010) found that highly palatable foods such as food high in fat and sugar content increased dopamine signaling in the nucleus accumbens of mice in a similar fashion to psychoactive drugs with repeated exposure, which could explain the addictive and uncontrollable nature of a binging episode.

Binge Drinking

A binge drinking episode has gender-based criteria and is operationally defined as; 4 or more drinks for females and 5 or more drinks for males (Kelly-Weeder, 2009; Hunt & Forbush, 2016). A standard drink is defined as 12 fl oz of beer, 5 fl oz of wine, and 1.5 fl oz of distilled spirits. The National Institute of Alcohol Abuse and Alcoholism (2004) has put forth guidelines for a binge drinking episode that includes a 2-hour time period when 4 or 5 alcoholic drinks for females and males respectively are being consumed. This corresponds to a Blood Alcohol Concentration (BAC) of .08 g/dl or

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

above. Alcohol use, especially in high frequency of consumption and/or quantity, can have severe risks and consequences in both mental health, physical well-being and social functioning (Cooper, 1994). In binge drinking, excessive alcohol consumption can result in a multitude of risky behaviors involving non-consenting sexual interactions, increased levels of aggression, risk-taking behaviors, and potential injury or/and death. Binge drinking can result in episodes of “black-outs” as well as elevated levels of BAC that can result in alcohol poisoning. Binge drinking is most noted in college samples and young adults, where societal circumstances and peer pressure promote cultures of “normalized” binge drinking behavior. Burke, Cromeens, Vail-Smoth, and Woolsey (2010) found that 74% of first year students who reported drinking engaged in at least 1 episode of binge drinking in the past 30 days. Additionally, research has indicated higher rates of binge drinking occurring in male populations than female (Rahal, Bryant, Darkes, Menzel, & Thompson, 2012; Laghi, 2012; Clark, Tran, Weiss, Caselli, Nikcevic, & Spada, 2012). Similar to the underlying etiology of dopamine functioning seen in binge eating, ethanol exposure leads to increased and reinforced dopamine pathways to the nucleus accumbens (Ji, Saha, & Martin, 2017). Additionally, chronic ethanol exposure can cause dopamine hypofunctioning in the mesolimbic system that in result promotes ethanol intake to compensate for decrease dopamine release (Weiss & Porrino, 2002), causing motivation for continued alcohol consumption.

Disordered Eating and Substance Use

Eating Disorders (ED) often occur simultaneously with Substance Use Disorders (SUDs) (Fouladi, Mitchell, Crosby, Engel, Crow, Hill, Le Grange, Powers, & Steffen, 2015, Gadalla & Piran, 2007) and has also been found to commonly occur in Disordered

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Eating Behavior (DEB) samples as well (Rush et al., 2016). When comparing the different ED classifications (i.e. Anorexia Nervosa, Bulimia Nervosa, Binge Eating Disorder) and their respective subtypes, varying substances and frequencies of substance use are found. For example, Fouladi et al. (2015) found that patients with Bulimia Nervosa (BN) reported using substances more frequently than any other ED group besides the Anorexia Nervosa (AN) subtype bingeing/purging group. This demonstrated that the combination of binge eating and purging possibly increases the risk of using substances in ED patients. Previous literature has explored numerous potential shared etiologies regarding topics such as impulsivity, personality traits, and emotion regulation difficulties.

Alcohol

As it specifically pertains to the use of alcohol, those with different clinical ED behaviors report varying frequencies of use and consumption rates. In general, research has found that women who fall under ED criteria report greater overall alcohol consumption and binge drinking episodes compared to other women (Luce, Engler, & Crowther, 2007). Past literature has found binge drinking rates as high as 72% in college samples (Balodis, Potenza, & Olmstead, 2009). In addition, college students, both males and females, with DEB's (i.e. excessive exercise, food restriction) are more likely than other students to engage in problematic drinking (Rush et al., 2016). Co-occurring eating disorder behaviors that results in restriction of calories and various other compensatory behaviors around alcohol consumption has been labeled "Drunkorexia" (Ward & Galante, 2015; Rahal et al., 2012). This distinct nomenclature has been created to isolate eating disorder behavior as it revolves only around the use of alcohol and its

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

consumption. In their sample, Burke et al. (2010) found that 14.2% of first year college students restricted their caloric intake in anticipation of drinking alcohol. Reasons or motivations for this reported behavior included avoiding weight gain and to increase the effects of alcohol (i.e. to get drunk quicker). Other research in college samples looking at disordered eating behavior co-occurring with binge drinking have similarly found rates being around 17.1% of males and 19.0% of females (Rush et al., 2016). Some research has found that the quantity of alcohol consumption does not necessarily differ between individuals who engage in drunkorexia and those who do not, but that the individuals who report doing so experience more alcohol-related consequences than their peers (Tuazon, Travis, Honderich, Williams, Menefee, & Gressard, 2019). These findings may be suggestive of the risks associated with drinking alcohol on an empty stomach, where BAC levels can quickly heighten (Mitchell, Teigen, & Ramchandani, 2014). Whether individuals restrict their calories before alcohol consumption or combat the calories through other means such as purging, they will require less alcohol to become intoxicated compared to individuals who would presumably drink with adequate food intake. Regardless, some research has reported differently on the amounts of alcohol that is consumed in these individuals. Of students who engaged in calorie restriction and drinking, Burke et al. (2010) found that 1/5th of those students also reported binge drinking more than 20 days in the past 30, indicating a pattern of problematic alcohol use in addition to the disordered eating behavior. These differences in findings could be explained by the different types of behaviors that are reported in different ED classifications; bingeing being predominantly characteristic of BN and BED individuals and acts of restriction which are commonly noted with AN restricting type.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Current literature has struggled with deciding whether drunkorexia behavior is more closely associated with ED or SUD symptomology (Hunt & Forbush, 2016). Martin, Groth, Longo, Rocha, and Martens (2015) found that disordered eating behaviors, such as meal skipping or self-induced vomiting, were stronger predictors of alcohol-related problems than binge drinking as a construct; and it was noted specifically for the common BN symptoms. Rahal et al. (2012) found that higher scores in compensatory actions were associated with both increased episodes of binge drinking and the quantity of alcohol being consumed. Excessive exercise is another common compensatory behavior used to combat calories and to lose weight. Hunt and Forbush (2016) found that when women scored high in excessive exercising, it became a significant predictor of their drunkorexia behavior, but this compensatory behavior was not predictive for men. Rahal et al. (2012) developed The Compensatory Eating and Behaviors in Response to Alcohol Consumption Scale (CEBRACS) to test commonalities between ED and SUD symptomology. Their strongest correlations for the CEBRAC measure aligned with the BN measures as opposed to other eating ED profiles (Rahal et al., 2012). Contrasting this finding, Ward and Galante (2015) through the development of The Drunkorexia Motives and Behaviors Scales found that drunkorexia motivation was derived mostly from drinking conformity motives for individuals. And finally, some research has concluded a combination of both ED and SUD characteristics as being explanatory for the interaction, yet gender differences arise. Hunt and Forbush (2016) found that alcohol misuse and disorder eating measured as separate constructs equally predicted drunkorexia behavior in men, but a stronger association was seen for disordered eating in females.

Alcohol with Binge Eating

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Individuals who engage in binge eating specifically have been reported as being more likely to be classified as binge drinkers or heavy drinkers than those who do not binge eat (Laghi et al., 2012). Other research additionally has found higher reported alcohol use for individuals classified in BN and BED groups (Luce et al., 2007), where binge eating is a diagnostic criterion. Additionally, Fouladi et al. (2015) reported that BN individuals also drink higher amounts of alcohol than other ED groups. Yet, other research has found associations with binge drinking and alcohol-related problems for AN and BN individuals, but not in individuals with BED (Martin et al., 2015). Binge eating is also reported in the AN purging/binging subtype which could help explain this finding. There are varying data regarding the prevalence of binge drinking and binge eating occurring simultaneously. Kelly-Weeder (2009) found co-occurring binge drinking and binge eating behaviors in college samples to be as high as 34.5% in women and 39% in men. Other research has documented the percentage of undergraduate students who both binge eat and binge drink as being around 25% (Rush et al., 2009). Some research has even suggested that it is possible that binge eating is specifically taking place while individuals are under the influence of alcohol (Hunt & Forbush, 2016).

Personality Traits

Patients diagnosed with BN and BED often experience co-occurring symptoms of Major Depressive Disorder, Anxiety, and Substance Use Disorders (Rotella et al., 2018). Neuroticism is a personality dimension that is often associated with such disorders as anxiety, depression and substance use disorders (Adan, Ferro, & Navaro, 2017). Past research has identified increased levels of neuroticism as being associated with individuals who engage in binge eating and drinking behaviors (Ferriter & Ray, 2011).

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Rush et al. (2009) found higher levels of neuroticism in their sample for the binge eating/binge drinking group compared to the individuals in the binge drink and non-binge groups. Interestingly, neuroticism was not different compared to the binge eat group in the sample. High levels of neuroticism, in addition to being paired with low levels of conscientiousness for an individual's personality style, has been associated in co-occurring binge eating and binge drinking samples (Rush et al., 2009). This personality style is often marked by levels of impulsivity, and impulsivity has also found to be correlated with individuals who engage in both binge eating and binge drinking (Ferriter & Ray, 2011; Rush et al., 2009; Hunt and Forbush, 2016). Impulsivity is characterized by inattentiveness, poor planning and risky behavior (Adan et al., 2017). In addition, Adan et al. (2017) found higher levels of neuroticism-anxiety and impulsive sensation-seeking dimensions in their binge drinking sample. Furthermore, they also found sex differences where women scored higher on neuroticism-anxiety and men scored higher on impulsive sensation-seeking (Adan et al., 2016). High scores on novelty seeking, which can be indicative of impulsivity, have been reported in binge eating behaviors (Rotella et al., 2018). Looking at additional Big-Five Personality traits, openness has been significantly associated to binge drinking, as well as individuals scoring high on extraversion measures (Martin et al., 2015; Adan et al., 2017). There is conflicting evidence on conscientiousness and the association with bingeing behaviors. Conscientiousness have been reported to be higher in binge drinking samples compared to those in binge eating (Rush et al., 2009), yet low scores on conscientiousness have still been noted in predicting problematic alcohol use (Clark et al., 2012). High scores on conscientiousness are often attributed to being less impulsive, but impulsivity is often seen in binge

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

drinking samples. In turn, it may be that individuals with at-risk personality profiles and scores on problematic dimensions of personality are more likely to experience negative affect and hence difficulties regulating their negative emotional states (Ferriter & Ray, 2011).

Emotion Regulation, Coping, and Motivation

Individuals experiencing general negative affect, often in the forms of depressive and anxious symptoms have varying coping mechanisms which can be interpreted as both positive and negative strategies. Some behaviors that individuals engage in as a means of coping with negative emotions have included repeated patterns of bingeing. Both binge eating and binge drinking have been reported as means of coping in individuals experiencing negative affect such as depression and/or anxiety symptoms (Ferriter & Ray, 2011). In addition, Laghi et al. (2012) also found that eating and drinking behaviors were used as means to cope with feelings of dissatisfaction and low self-esteem. Heavy drinking and binge eating have been noted to occur in situations where individuals experience unpleasant emotions, physical discomfort, and urges/temptations (Birch, Stewart, & Brown, 2007). In their research, Rotella et al. (2018) found higher scores on Emotional Eating Scale components in their binge eating group compared to the non-binge group, as well as higher concerns with shape and weight. This may show that binge eating serves as product of emotional difficulties for individuals. Luce et al. (2007) found that women with BN used binge eating as a means to reduce or avoid their negative affect. In addition, research has shown that BN and BED individuals are significantly more likely to use alcohol as a coping mechanism compared to the other ED groups (Luce et al., 2007). BN and BED both share markers of binge eating in their disordered

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

eating behavior, and with the combined risk of problematic coping with alcohol, bingeing behavior may be a general coping mechanism that isn't limited to solely food or alcohol, but should be investigated as a separate construct alone.

Emotional dysregulation has been noted as motivation for problematic drinking behavior as well as disordered eating habits. Individuals who report coping and enhancement motivations for drinking have been associated with heavier drinking and be predictors of problem drinking, more so than individuals who use alcohol for social reasons (Cooper, 1994). Birch, Stewart, and Brown (2007) found that heavy drinking was likely to occur with the potential for emotional rewards, such as socializing. The relationship between emotional regulation and affect as it predicts alcohol use may be mediated by gender differences. Pompili and Laghi (2018) found that engaging in drunkorexia behaviors through the desire to enhance positive affect resulted in emotion dysregulation being a significant predictor of drunkorexia behavior only in the males of their sample, while the females reported drunkorexia behavior as a means to make social gatherings more fun. Females have been more likely to be classified as social drinkers compared to males who are more likely to be classified as heavy drinkers (Laghi et al., 2012). Cooper (1994) additionally found that conformity motives for drinking predicted drinking problems compared to those who drink for enhancement or social motivations.

The Current Study

Based on the current literature, the purpose of the present study is to explore the potential differences in emotional regulation, negative affect, motivations, impulsivity, and aspects of personality that may be different amongst those who binge eat, binge drink, or do both bingeing acts verses normal controls in adolescents/young adults. Female

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

college students between the ages of 18-25 will be categorized into one of four mutually exclusive groups based on their various binge drinking and/or binge eating behavior. The four groups will be binge eating, binge drinking, combined bingeing, and controls who engage in neither behavior. Several hypotheses will be advanced. The first hypothesis of this study is that there will be differences in emotional regulation difficulties for those in the Binge Eating group, Binge Drinking and the Combined Binge group compared to the healthy controls. Additionally, it is hypothesized that the Combined Binge group will have the highest reported difficulties in emotional regulation compared to the other three groups. We also hypothesize group differences in levels of depression, anxiety and stress and a total composite score of negative affect. We expect that the Binge Eating group, Binge Drinking group, and Combined Binge group will have higher scores compared to our Control group, while we do not expect significant differences between the Binge Eating group and the Combined Binge group. We also expect higher scores of neuroticism and lower scores of conscientiousness to be present in all of our pathology groups compared to the Control group, and the highest levels of extroversion will be present in those who report binge drinking due to the socializing component of binge drinking culture. We also hypothesize that levels of impulsivity will be greater in the Combined Binge group compared to the other three groups being investigated.

Impulsivity is associated with loss of control or the inability to regulate actions or cognitions, and it has been present in both kinds of bingeing behaviors. Additionally, we hypothesize gender differences in impulsivity levels to be present, whereas males score higher than females. Our final two hypotheses regard motivational differences reported for drinking alcohol. We expect similar motivations to be reported between the Binge

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Drinking group and the Combined Binge group compared to those in the Binge Eating group and Control. Finally, we hypothesize that motivations for drinking will differ by gender across all groups; women will report drinking for more reasons regarding conformity values compared to males who historically report drinking for mood enhancement. Past research has looked at drunkorexia specifically as it pertains to motivational differences in gender for drinking while the current study aims to also explore binge eating and binge drinking separately.

Methods

Participants

Undergraduate students enrolled in level 100 or 200 psychology courses at the University of North Dakota were recruited through the use of the SONA research participation system. Participants completed the survey anonymously and were assigned a randomized subject number, so all personal identifiers were removed upon the completion of data collection. All study materials were approved by the university's Institution Review Board (IRB) and participants were provided information about counseling and health services at the conclusion of the study. Participants were compensated 1 research credit for their time that they could use towards completion of research requirements associated with their PSYC 100 or 200-level course.

One hundred and seventy-four undergraduates completed the survey. Data from 34 participants was removed from the sample during preliminary data cleaning due to failed attention checks ($n= 18$), completion of the study too quickly (15 mins or less; $n= 10$), failure to completely answer the survey questions ($n= 4$), and if they were over the age of 25 ($n= 2$). The final sample comprised of one hundred and forty participants were

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

left (90.7% females ($n = 127$), 9.3% males ($n = 13$)). All participants were between the ages of 18-25. Only females were included into the statistical analyses due to the small sample size of males. Of the females, 90.6% identified as white ($n = 115$), 5.5% Hispanic or Latino ($n = 7$), 4.7% Native American or American Indian ($n = 6$), 2.4% Asian or Pacific Islander ($n = 3$), and 1.6% Black or African American ($n = 2$). All demographic information is presented in Table 1.

Materials

Demographic Information Questionnaire. Personal information including gender, age, ethnic and/or racial group, current height/weight and reported history of substance use and eating disorder diagnosis were asked of all participants.

The Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) contains 10 items used to assess hazardous drinking behavior, including amount of consumption, reactions and alcohol-related problems (Hunt and Forbush, 2016). Scoring responses range from 0 to 4, whereas the higher total score corresponds to more harmful drinking behaviors. A sample item would be “How many drinks containing alcohol do you have on a typical day when you are drinking?”. Response choices: 1 or 2 = *score of 0*, 3 or 4 = *score of 1*, 5 or 6 = *score of 2*, 7 to 9 = *score of 3*, 10 or more = *score of 4*. The AUDIT has acceptable internal consistency reliability ($\alpha = .70$) (Tuazon et al., 2016) and good reported test-retest reliability ($r=.90$) (Rubio, Bermejo, Caballero, & Santo-Domingo, 1998). A score of 8 or more is considered to indicate hazardous or harmful alcohol use.

The Eating Disorder Diagnostic Scale (EDDS-DSM V version; Stice, Telch, & Rizvi, 2000) assess symptomology of potential eating disorders over the past 3 months.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

The scale asks various items assessing cognitions, emotions and behaviors revolving around eating (*Have you felt fat?, Eat until you felt uncomfortably full?, Made yourself vomit?*). The EDDS can be used to diagnose AN, BN, BED, atypical AN, low frequency BN, low frequency BED, purging disorder and night eating syndrome as well as compute a total composite score of symptoms. The EDDS has shown good test-retest reliability for overall symptom composite scores ($r=.87$) and excellent reliability in each of the three diagnosis scales (AN = .98, BN = .91, BED = .89) over a 1-week period (Stice et al., 2000). Internal consistency estimates of overall symptom composite scores in EDDS have yielded Cronbach's alpha scores of .91 (Stice, 2000), while estimates for individual subscales are lower for AN (alpha = .54), BN (alpha = .74), and BED (alpha = .72) (Martin et al., 2015).

The Drinking Motives Questionnaire (DMQ; Cooper, 1994). The DMQ assess four motivations for drinking; social, coping, mood enhancement, and conformity. Each of the four measures contains 5 items. An example of social motivation would be "*Because it improves parties and celebrations*". An item example of coping would be represented by "*To cheer you up when you are in a bad mood*". An example of mood enhancement would be "*Because it gives you a pleasant feeling*". An item representing conformity motivation would be "*Because your friends pressure you to drink*". For the current study, all four DMQ-R subscales had good internal consistency; social ($\alpha=.919$), coping ($\alpha=.887$), enhancement ($\alpha=.853$), and conformity ($\alpha=.789$).

The Drunkorexia Motives and Behaviors Scale (DMBS; Ward & Galante, 2015). The DMBS includes two factors; motives and behaviors, and has 23 questions total using Likert scaling ranging from (1) never, (2) almost never, (3) sometimes, (4) almost

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

always, to (5) always. Drunkorexia motives are assessed by 11 items, while behavior has 12 items. An item that is representative of motivation would be “*Because it makes social gathering more fun*” and an item representative of behavior would be “*By eating less all day*”. The DMBS has demonstrated good internal consistency for both enhancement ($\alpha=.87$) and conformity values ($\alpha=.81$) (Pompili & Laghi, 2018) and excellent reliability (Ward & Galante, 2015). In the current study, motives had a good reliability ($\alpha=.854$) and behaviors had an excellent reliability ($\alpha=.948$).

Barratt Impulsiveness Scale (BIS-11; Patton, Stanford, & Barratt, 1995) includes 30 items that assess varying levels of impulsivity mostly noted as rash-spontaneous behaviors. Responses are indicated on a scale of 1 (*rarely/never*), 2 (*occasionally*), 3 (*often*), to 4 (*almost always/always*). Higher responses indicate greater impulsiveness. Past research has shown a good overall internal consistency of the BIS ($\alpha = .82$) and its reliability ($\alpha = .72-.83$) (Steinberg, 2012; Schag, 2013). Cronbach’s alpha for overall composite score of the BIS-11 had acceptable reliability in the current study ($\alpha=.68$).

The Depression Anxiety Stress Scale (DASS; Lovibond, S.H. & Lovibond, P.F. 1995) was used to assess depression, anxiety and stress levels. The DASS questionnaire features 42 questions regarding statements about depression, anxiety and stress and can be broken into three separate composite scores for each. An example item pertaining to depression would be “*I couldn’t seem to experience any positive feeling at all*”. A question example regarding anxiety would be “*I felt scared without any good reason*”. A question indicative of stress would be “*I found myself getting upset rather easily*”. Answer choices range from 0 (*did not apply to me at all*), 1 (*applied to me to some degree, some of the time*), 2 (*applied to me to a considerable degree, or a good part of*

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

time), or 3 (*applied to me very much, or most of the time*) where subjects are asked to indicate how much the statement applies to them during the duration of their past week. Higher scores on items are indicative of greater severity. In the current study, reliability calculated for each subscale of the DASS reported excellent Cronbach's alphas for depression ($\alpha=.953$), anxiety ($\alpha=.874$), and stress ($\alpha=.909$).

The Perth Emotion Regulation Competency Inventory (PERCI; Preece, Becerra, Robinson, Dandy, & Allan, 2018) has 32 items that measure people's ability to regulate their own emotions. The PERCI features eight subscales each containing four items. Four of the eight subscales correspond to the regulation of negative emotions and four correspond to the regulation of positive emotions. Each item is scored on a 7-point Likert scale ranging from 1 (*strongly agree*) to 7 (*strongly disagree*). Higher scores for each subscale as well as the total composite score are indicative of greater emotion regulation difficulties. An item example representative of negative emotion regulation would be "*When I'm feeling bad, those feelings stop me from getting work done*". An example of positive emotion regulation would be "*When I'm feeling good, I have trouble completing tasks that I'm meant to be doing*". Each subscale has good to excellent internal consistency ($\alpha=0.85-0.94$) and all composite scores have shown to have excellent internal consistency reliability as well ($\alpha=0.92-0.94$) (Preece et al., 2018). Five of the eight subscales were used in the current study, and all subscales demonstrated good to excellent reliability; negative emotion regulation ($\alpha=.917$), positive emotion regulation ($\alpha=.902$), positive containing regulation ($\alpha=.893$), hedonic goals ($\alpha=.93$), and general overall regulation ($\alpha=.937$).

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

The Big Five Inventory (BFI; John & Srivastava, 1999) scale is used to assess five dimensions of personality in individuals. A total of 44-items is presented in the scale where each of the 5 dimensions are further divided into separate personality facets. Each item is ranked on a scale from 1-5 where subjects indicate the extent to which they agree or disagree with the statement (1 = *strongly disagree*, 2 = *disagree a little*, 3 = *neither agree nor disagree*, 4 = *agree a little*, 5 = *strongly agree*). The five personality dimensions assessed via the BFI are Extraversion vs. introversion, Agreeableness vs. antagonism, Conscientiousness vs. lack of direction, Neuroticism vs. emotional stability, and Openness vs. closedness to experience. Extraversion considers traits of gregariousness and warmth and it is represented by an item scale such as “Is talkative”. Agreeableness considers traits of altruism and compliance. A representative item is “Is helpful and unselfish with others”. The dimension of conscientiousness is characterized by traits of self-discipline and order. An example of an item to assess conscientiousness is “Is a reliable worker”. Neuroticism as a dimension has traits of anxiety and self-consciousness. A question example is “Can be moody”. Openness includes traits of aesthetics and fantasy. A representative item is “Is inventive”. The BFI has demonstrated good test-retest reliability ranging from .76 to .83 for each of the five personality dimensions (Gosling, Rentfrow, & Swann, 2003). In the current study, all personality dimensions revealed good internal consistency; openness ($\alpha=.777$), conscientiousness ($\alpha=.817$), extraversion ($\alpha=.874$), agreeableness ($\alpha=.83$), and neuroticism ($\alpha=.803$).

Procedure and statistical analysis

Data were analyzed using SPSS Version 25. A series of one-way Multivariate Analysis of Variance (MANOVA) with Bonferroni’s alpha correction (0.0125) were used

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

to assess group differences of eating and drinking behaviors with traits of personality, motivations, emotional regulation difficulties, and negative affect. Participants were assigned into one of four mutually exclusive groups based on their reported eating and drinking behaviors. Formation of groups was determined by an individual's score on the EDDS estimate of binge eating symptomology and their response to the third question of the AUDIT (*How often do you have six or more drinks on one occasion?*). Both variables were dichotomized into 0 for non-binge eaters and non-binge drinks or 1 for binge drinkers and binge eaters. Each subject was assigned into one of four different groups, the Binge eating group (BE), Binge drinking group (BD), Combined group (BE/BD), and the Control group. In order to be included in the BE group, subjects met the threshold for binge eating based on the EDDS behavior subscale (EDDS score = 1). To be included in the BD group, subjects responded yes to have reported drinking six or more drinks in one occasion (AUDIT score = 1). The subjects who meet both of these requirements for the BE and BD groups were separately put into the combined BE/BD group (value scores 1 and 1). All other subjects were assigned to the control group (value equals 0 and 0).

A *Missing Values Analysis* was conducted through SPSS to calculate estimated means for the following outcome variables; PERCI, Drunkorexia Motives and Behaviors Scale, DASS and DMQ. The obtained estimated means based on the Maximum Likelihood Procedure were then used to impute missing values that comprised of 1.6-2.4% of the data. Cronbach's alpha to test for reliability of all outcome variables were reported as well as scale means, standard deviations, sample size and range which can be seen in Table 2. Univariate outliers were identified with Box and Whisker plots, where extreme outliers below 5% and above 95% were removed from each respective analysis.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

For each separate MANOVA, multivariate outliers were determined and removed by the use of Mahalanbois' distance with appropriate chi-square values based on each number of DV's. Further univariate and post hoc testing were conducted for all significant main effect findings.

Results

Descriptive Statistics

A total of five different one-way MANOVA's were conducted with the independent variable 'group status' having four levels: binge eating, binge drinking, combined, and controls. The sample included 56 binge drinkers (binge drinking; 44.1%), 11 binge eaters (binge eating; 8.7%), 24 binge drinkers and eaters (combined; 18.9%), and 36 who did not engage in either behavior (controls; 28.3%).

Preliminary Findings

Bivariate correlations for three aspects of negative affect were conducted for each binging sample, binge eaters and binge drinkers. Binge eating was positively correlated with depression ($r = .204, p = .034$), anxiety ($r = .323, p = .001$), and stress ($r = .333, p = .000$). Binge drinking was negatively correlated with each aspect of negative affect, but no significant relationship was found. Correlational findings are reported in Table 3.

Bivariate correlational results for emotional regulation found a significant relationship between binge eating and negative emotion regulation ($r = .246, p = .011$), hedonic goals ($r = .219, p = .025$), and impulsivity ($r = .318, p = 0.01$). Binge drinking had no significant correlational findings with various emotional regulation difficulties. Correlational results can be seen in Table 4.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Five dimensions of personality were tested, and two yielded significant negative correlational findings for binge drinking including conscientiousness ($r = -.196, p = .030$) and agreeableness ($r = -.233, p = .010$). Additionally, a positive bivariate correlation was found with extraversion ($r = .217, p = .016$). No significant findings were reported for binge eating.

MANOVAs

Drinking Motives Questionnaire (DMQ-R)

To adjust for the violation of the assumption of equal covariance (homoscedasticity, Box M = 87.860, Sig = .000), a one-way MANOVA was conducted with all four DMQ-R subscale motivation types; social, coping, enhancement, and conformity utilizing Pillai's trace. There was an overall main multivariate effect [$V = .435, F(12, 327.00) = 4.63, p = .000, \eta_p^2 = .145$] between drinking motivations and the four different binge groups. Further univariate testing revealed significant findings for group differences in social motivations ($M = 14.18, SD = 5.44$), [$F(3, 444.83) = 24.41, p = .000, \eta_p^2 = .40$], coping ($M = 8.96, SD = 4.11$), [$F(3, 106.91) = 7.41, p = .000, \eta_p^2 = .168$], and enhancement ($M = 11.85, SD = 4.66$), [$F(3, 275.88) = 18.65, p = .000, \eta_p^2 = .337$]. There were no significant main effects reported for conformity motives ($M = 6.67, SD = 2.26$), [$F(3, 11.87) = 2.40, p = .071, \eta_p^2 = .062$].

Bonferroni post hoc analyses were conducted on all significant univariate main effects. For social motivation the binge eating group ($M = 10.20, SD = 5.53$) had significantly lower scores than the binge drinking group ($M = 16.20, SD = 3.67$) and the combined group ($M = 17.91, SD = 3.69$). The binge drinking and combined groups did not significantly differ. Additionally, the control group ($M = 9.66, SD = 5.03$) scored

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

significantly lower than both the binge drinking group ($M = 16.20, SD = 3.67$) and the combined group ($M = 17.91, SD = 3.69$), but did not differ from the binge eating group.

For coping, the binge drinking ($M = 9.87, SD = 4.23$) and combined ($M = 10.90, SD = 4.25$) groups both had significantly higher scores than the binge eating ($M = 6.20, SD = 1.62$) and control group ($M = 7.03, SD = 4.02$). The binge drinking group means did not differ from the combined group, and the binge eating group and control group did not significantly differ.

Enhancement motives differed between the binge drinking ($M = 13.57, SD = 3.49$) group and both binge eating ($M = 8.50, SD = 4.53$) and controls ($M = 8.31, SD = 4.02$). The binge eating group was not significantly different than the controls. The combined binge ($M = 14.56, SD = 4.02$) group also had significantly higher enhancement motives compared to the binge eating ($M = 8.50, SD = 4.53$) and combined ($M = 8.31, SD = 4.02$) groups. All findings are reported in Table 6 and Figure 1.

Drunkorexia Motives and Behaviors Scale

Two subscales of Drunkorexia were assessed in a one-way MANOVA with binge eating, binge drinking, combined, and control groups. There was a significant multivariate main effect using Pillai's trace due to assumption violations [$V = .283, F(6, 210.00) = 5.76, p = .000, \eta_p^2 = .141$] and upon further univariate testing, both drunkorexia motives ($M = 12.72, SD = 2.93$), [$F(3, 32.81) = 4.12, p = .008, \eta_p^2 = .106$] and behaviors ($M = 17.63, SD = 7.66$), [$F(3, 580.14) = 13.27, p = .000, \eta_p^2 = .275$] had significant main effects.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Post hoc analyses showed a significant mean difference for motivations between the combined binge group ($M = 14.33$, $SD = 4.31$) and the controls ($M = 12.74$, $SD = 2.93$). There were no other significant group differences reported.

Bonferroni post hoc testing for behaviors found significant differences for the combined binge group ($M = 24.95$, $SD = 9.24$) compared to the binge eating ($M = 14.44$, $SD = 4.19$), binge drinking ($M = 18.00$, $SD = 7.00$), and control groups ($M = 13.41$, $SD = 4.11$). Additionally, the binge drinking group ($M = 18.00$, $SD = 7.00$) had a significantly larger score on the behaviors scale compared to the controls ($M = 13.41$, $SD = 4.11$). No other group differences were found. Results are reported in Table 7 and Figure 2.

Negative Affect

A square root transformation was performed before the main analyses due to violations of the homogeneity of variance assumption on all of the negative affect variables. After correction, a significant multivariate effect [$\Lambda = .876$, $F(9, 260.00) = 5.76$, $p = .000$, $\eta_p^2 = .109$] was found with Wilks's statistic for a one-way MANOVA looking at depression, anxiety, and stress. Subsequent univariate testing found a significant main effect for anxiety ($M = 6.17$, $SD = 6.16$), [$F(3, 5.64) = 3.88$, $p = .011$, $\eta_p^2 = .097$], a marginal effect for depression ($M = 6.67$, $SD = 8.06$), [$F(3, 5.76) = 2.66$, $p = .052$, $\eta_p^2 = .068$], and non-significant result for stress ($M = 9.50$, $SD = 7.50$), [$F(3, 3.98) = 2.33$, $p = .078$, $\eta_p^2 = .060$].

Further post hoc comparisons with Bonferroni adjustments revealed that the combined binge group ($M = 2.68$, $SD = 1.35$) had significantly higher anxiety scores compared only to the binge drinking group ($M = 1.76$, $SD = 1.11$). No other group differences were found. See Table 8.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Personality Dimensions

Using Wilks's statistics, there was a significant multivariate effect [$\Lambda = .755, F(15, 279.22) = 1.99, p = .016, \eta_p^2 = .089$] for five dimensions of personality via a one-way MANOVA. However, separate univariate tests on the outcome variables revealed significant effects only for extraversion ($M = 25.39, SD = 6.80$), [$F(3, 149.59) = 3.46, p = .019, \eta_p^2 = .090$], but no significance for openness ($M = 32.77, SD = 5.84$), [$F(3, 71.21) = 2.15, p = .098, \eta_p^2 = .058$], conscientiousness ($M = 33.84, SD = 5.91$), [$F(3, 31.044) = 1.21, p = .311, \eta_p^2 = .033$], agreeableness ($M = 36.42, SD = 4.87$), [$F(3, 48.396) = 2.11, p = .104, \eta_p^2 = .057$], or neuroticism ($M = 24.87, SD = 5.91$), [$F(3, 9.81) = .275, p = .843, \eta_p^2 = .008$].

Bonferroni post hoc testing for extraversion showed a significantly larger mean score for the binge drinking group ($M = 27.36, SD = 6.19$) compared to the controls ($M = 22.72, SD = 7.35$). No other group difference was significant. All results are reported in Table 9.

Emotional regulation

The final one-way MANOVA was conducted for six different aspects of emotional regulation difficulties among the different binge groups. A significant multivariate main effect was detected using Wilks's statistic [$\Lambda = .780, F(12, 270.16) = 2.22, p = .011, \eta_p^2 = .080$]. Follow-up univariate testing showed significant main effects for negative emotional regulation ($M = 47.47, SD = 17.28$), [$F(3, 919.09) = 3.27, p = .024, \eta_p^2 = .086$], hedonic goals regulation ($M = 56.91, SD = 20.83$), [$F(3, 1286.53) = 3.14, p = .028, \eta_p^2 = .082$] and impulsivity ($M = 68.38, SD = 7.69$), [$F(3, 194.99) = 3.53, p = .017, \eta_p^2 = .092$]. Positive emotional regulation ($M = 29.87, SD = 12.30$), [$F(3, 78.36) = .511,$

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

$p = .676$, $\eta_p^2 = .014$], positive containing regulation ($M = 20.43$, $SD = 8.86$), [$F(3, 43.53) = .548$, $p = .651$, $\eta_p^2 = .015$] and general emotional regulation ($M = 77.34$, $SD = 26.37$), [$F(3, 1449.77) = 2.15$, $p = .098$, $\eta_p^2 = .058$] did not yield significant findings. Mean scores and standard deviations are reported in Table 10.

For hedonic regulation, there were no significant group mean differences via post hoc testing, just the overall main effect was significant.

Post hoc testing with Tukey adjustments conducted for impulsivity found that those in the combined binge group ($M = 71.58$, $SD = 6.91$) scored significantly higher than the controls ($M = 65.52$, $SD = 7.25$), and for negative emotional regulation those in the combined binge group ($M = 55.53$, $SD = 13.98$) scored significantly higher in regulation difficulty than those in the control group ($M = 42.35$, $SD = 16.29$). No other post hoc findings were significant.

Discussion

The purpose of the present study was to further understand differences of binge eating and drinking symptomology and behavior, while specifically aiming to look at individuals with singular bingeing behaviors and comorbid bingeing. The four investigated groups showed both similarities and differences of motivation, emotional regulation, and negative affect that add to the understanding of bingeing as a construct.

Motivations

Consistent with the hypothesis, the binge drinking group and the combined group did not differ on their reported drinking motivations. Similar findings were reported for both the binge drinking groups in social motives, enhancement, and coping, but was not seen for conformity motives. Our findings are comparable to Holcomb, Huang, Cruz, and

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Marinkovic (2019) where binge drinkers had high levels of social, coping and enhancement motives. But contrary to our findings, Trojankowski et al. (2019) reported higher coping motives for their comorbid binge group compared to the binge drinking group and for conformity motives as well. It should be noted that our sample contained only females compared to sample used by Trojankowskis et al. (2019) which had both males and females, whereas differences in gender could have influence on each of these findings.

Social motivations for engaging in drinking showed that those in the binge eating group had significantly lower scores of social motivations compared to both the binge drinking group and the combined group, yet this was the binge eating group's highest endorsed drinking motivation. Additionally, the control group similarly had significantly lower social motivation scores than the binge drinking and combined group. The sample specifically demonstrated social motives as being the highest endorsed drinking motive out of all four subscales, which is consistent with past research (Simons, Hahn, Simons, & Hanako, 2017).

The hypothesis was further supported by similar results reported coping motivations for drinking which are characteristic of drinking to deal with negative affect and emotions showed similar results to those found for social motives. Binge eaters and controls again showed significantly lower scores of coping motives compared to the binge drinkers and the combined binge group. The binge eating group actually had the lowest mean score on coping motivation reported amongst the four groups. This finding in particular is noteworthy due to the fact that historically binge eating populations report coping as their highest drinking motivation (Luce et al., 2007). Our sample differed by

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

the fact that the binge eating group actually reported social reasons as the highest motivation to drink. One possible explanation for this discrepancy, is that our sample was not a clinical ED population, but was comprised of college students. The sample showed limited binge eating behavior, and did not provide a BN or BED diagnosis. Trojanoski, Adams, and Fischer (2019) found similar findings, where binge eaters scored highest for social and enhancement reasons, followed by coping and conformity. This might mean that individuals who binge eat do not drink for coping motives, as that food may be the coping mechanism for them. This study did not use the inclusion of food motivations as an instrument to investigate this theory.

Finally, enhancement motives among binge eaters and controls were the lowest compared to those in the binge drinking group and the combined group. Similar to findings from Pompili and Laghi (2019), our results only found that social, enhancement, and coping motives related to binge drinking, and no significant results were reported for conformity motives. Although our binge eating group did not significantly differ from the control group for any of the drinking motivations, it should be mentioned that scores on enhancement and social motives for the binge eaters were greater, which is congruent with other past findings (Pompili & Laghi, 2019; Fazzino, Raheel, Peppercorn, Forbush, Kirby, Sher, & Befor, 2018), except for coping motivation findings. General findings for drinking and eating disorder populations have increased alcohol use for coping reasons in BN and BED samples compared to other ED groups and non-ED groups (Luce et al., 2007), which is contradictory to the results found in this study.

Collectively these findings demonstrated that the binge drinking and the combined binge group do not differ for reasons for alcohol consumption. These shared

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

motivations of binge drinkers in both of the groups possibly indicates an important aspect of alcohol's effects on those who engage in binge eating and binge drinking, which importantly separates them from the binge eating class. This represents an important distinction between our combined group and binge eating group, despite both groups displaying binge eating symptomology, the addition of binge drinking behavior in the combined group represents another aspect of pathology that needs to be addressed separately. Binge drinking adds an additional layer of problematic behavior, demonstrating that food alone may not be used for coping or enhancement reasons for these individuals, that both alcohol and food serve as coping and enhancement motivators in combined binging populations. Trojanowski et al. (2019) found higher eating motives for their combined binge group compared to the alcohol group which in conjunction with our findings shows very clear distinction of binging behaviors and symptomology that stretches across both food and alcohol for these individuals.

Past research has found higher uses of alcohol in BN samples, compared to other ED population (Fouladi et al., 2015), but in this sample the binge eaters were further separated by differences in drinking behaviors, which seems to point to a difference for those who engage in more than one binging behavior. Although this study did not include motivations for eating behaviors, alcohol may serve as an important coping tool for those who engage in binge drinking regardless of other behaviors and symptoms of pathology, possibly explaining the lack of different motivation reported between the binge drinking and combined groups.

One of the most notable findings in this study was the stark differences in drunkorexia behaviors for the combined binge group compared to all other investigated

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

groups. Not only did the combined group score highest on behaviors, the binge drinking group also was significantly higher than the control group, and oddly enough, the binge eating group was lower than the binge drinking group. This finding seems contradictory to the nature of drunkorexia which is characterized by symptomology of disordered eating and alcohol use, not specifically by binge drinking behavior (Rahal et al., 2012; Ward & Galante, 2015). Contrary to findings in the development of the CEBRACS measure, Rahal et al. (2012) found the total composite CEBRACS scores to be correlated with bulimia symptoms, as well as drive for thinness and higher levels of body dissatisfaction. The current findings do not support this, but BN symptoms also include purging which could be driving the relationship as opposed to binge eating which was solely assessed. The current study's results could be explained in part by the findings of Hunt and Forbush (2016), who reported that disordered eating predicts inappropriate compensatory behaviors to avoid weight gain from consuming alcohol (ICB-WGA)(i.e. drunkorexia) better than alcohol use did in their sample for females, but binge eating specifically did not predict this. Binge eating itself is not a compensatory behavior, but purging and excessive exercise associated with BN are. Additionally, Hunt and Forbush (2016) found that alcohol use mediated the relationship between binge eating and ICB-WGA. This seems to be consistent with the current findings as well, where the binge eaters did not demonstrate as high of drunkorexia behaviors as did the binge drinking groups, and especially the combined group which had the highest score of drunkorexia behaviors. This study's findings in conjunction with Hunt and Forbush (2016) demonstrate that other disordered eating behaviors that do not include binge eating are more likely connected to drunkorexia behaviors.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

For drunkorexia motivations, the combined group and the control group showed the only two significant mean difference. The combined group had the highest mean scores, followed by the binge drinking group, the controls, and followed by the binge eating group. The lack of a significant difference of means between the combined group and the binge eating group may be due to the small sample size of binge eaters ($n = 9$) and lack of statistical power. These findings also further demonstrate that drunkorexia may be more related to binge drinking than to binge eating symptomology. A rationale for this conclusion could be that the high caloric nature of alcohol may promote the drunkorexia behavior in binge drinkers specifically, due the high amounts of alcohol being consumed. Drunkorexia includes multiple disordered eating behaviors and does not necessarily focus on binge drinking alone, but in the current sample the separation of binge drinking and binge eating may influence drunkorexia stronger than previously thought. Knight, Castelnuovo, Pietrabissa, Manzoni, and Simpson (2016) have found that binge drinking is significantly related to the dietary restriction and exercise and diet subscale of the CEBRACS (Rahal et al., 2009) but not related to the bulimia subscale which is indicative of binge eating and other compensatory behaviors. Contradicting this finding, Kelly-Weeder (2009) found no relationship between healthy/unhealthy weight loss behaviors and binge drinking in their sample but did find positive correlations as it pertained to binge eating.

Further research should be conducted to explore and understand the relationship between drunkorexia behaviors and BN symptoms, specifically focusing on purging or other compensatory behaviors as opposed to binge eating. In addition, drunkorexia

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

research should look at patterns of alcohol use and investigate if binge drinking behavior has a stronger relationship than other problematic alcohol use behaviors.

Negative Affect

The original hypothesis presented regarding depression, anxiety, and stress expected higher scores to be present for all pathology groups compared to the controls, while the binge eating and combined binge group would not differ on severity. The results did not support this hypothesis, but instead showed significant differences in anxiety for the combined binge group compared to the binge drinking group. Anxiety scores did not differ for the combined group, binge eating group, and the controls, which partially supports the original hypothesis. The added pathological symptom of binge eating in the combined group may help explain the difference in anxiety between the two binge drinking groups. The depression scores were marginally significant, whereas binge eaters and the combined group scored similarly compared to the binge drinkers and controls who had lower mean scores. Past research has found higher levels of negative affect in patients with BN (Bodell, Pearson, Smith, Cao, Crosby, Peterson, Crow, & Berg, 2019), and is overall seen as a more severe psychiatric condition (Rotella et al., 2018). Due to the combined group in this sample having higher scores of anxiety than the binge drinkers, this may be related to the additional binge eating symptom which previously is related to higher levels of anxiety (Rotella et al., 2018). The combined group did report the highest levels of both anxiety and depression out of all pathology groups, which demonstrates a more severe level of pathology in those who do two kinds of binge behaviors compared to one. Adding the similar levels of anxiety in the combined and binge eating group, this may show that binge eating symptomology is

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

driving the group relationships seen in our results. Previous research has noted clinical levels of depression and anxiety in binge eating populations (Rotella et al., 2018), but the presented findings only displayed signs of anxiety being present. Based on the findings from the bivariate correlations, binge eating was positively correlated with depression, anxiety, and stress, but binge drinking had no significant correlations. Additionally, binge drinking populations have also demonstrated larger levels of anxiety and depression compared to non-binge drinkers (Holcomb et al., 2019).

Personality Dimensions

The only significant finding for dimensions of personality between the four binge groups was present in extraversion scores. Extraversion differences were seen between the binge drinking group and the control group. This finding supported our hypothesis which stated that the highest levels of extraversion would be present in the binge drinking group, most likely due to the social component of binge drinking culture (Cooper, 1994; Adan et al., 2017). Differences in neuroticism and conscientiousness scores were not significant, but based on the bivariate correlations conducted, binge drinking was negatively correlated with conscientiousness and agreeableness, while no significant relationship was demonstrated with binge eating. This is in line with previous findings from Clark et al. (2012) who reported that low scores on the conscientiousness subscale predicted problematic alcohol use. Other studies have failed to demonstrate differences on personality dimensions between binge drinkers and non-binge drinking samples (Holcomb et al., 2019). Possibly due to the lack of statistical power, the hypothesis regarding higher scores of neuroticism and lower scores of conscientiousness between the pathology groups was not supported.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Emotional Regulation

The results found significant differences between the combined binge group and the control group for levels of impulsivity and negative emotion regulation. This partially supports the initial hypothesis made regarding impulsivity whereas the combined group would demonstrate the highest mean score compared to all other groups, yet only the controls were significantly different. Previous research has found that binge drinking is positively correlated with impulsivity (Harris, Stewart, Krzyaniak, Charuhuas, Moon, Holdren, Manuel, Davis, & Joy, 2017), but the current results actually showed higher levels of impulsivity in the groups that were binge eaters. The correlational findings also found a significant positive relationship between binge eating and impulsivity, which was not observed for binge drinking. Thus, a potential conclusion is that binge eating symptomology has greater associated impulsivity issues than binge drinking. Past research had found that both symptoms of BN and binge drinking are associated with multiple dimensions of impulsivity (Fischer, 2011; Rolland et al., 2017). Additionally, Ward and Galante (2015) have found impulsivity to be correlated with drunkorexia symptoms specifically.

Though the current study found significant main effects for hedonic goals and negative emotional regulation, post hoc testing revealed only significant differences between the combined group and the controls for negative regulation. The original hypothesis regarding emotional regulation difficulties predicted that the combined group would have the overall largest difficulties; this was supported only for the negative emotion regulation subscale. In their sample, Trojanowski et al. (2019) found that binge eaters and the co-morbid binge group scored higher than binge drinkers for difficulties

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

with emotional regulation, which the current findings partially support as there were no significant differences on these measures between the binge eating and binge drinking group. Binge eating has been positively correlated with emotional regulation difficulties (Laghi, Bianchi, Pompili, Lonigro, & Baiocco, 2018), but the correlational findings only suggested this relationship for negative emotion regulation difficulties and hedonic goals, which both are characterized by difficulties of down regulation negative emotions. Other research has found mixed results on emotional regulation with its relationship to eating and drinking behaviors including gender differences in drunkorexia samples (Pompili & Laghi, 2018) and alcohol consumption versus alcohol-related problems (Simons et al., 2017). With the use of the PERCI scale, an attempt was made to parse out different aspects of emotional regulation which to the best of our knowledge was the first study to do so in a bingeing sample. Further research should be conducted to explore various bingeing behaviors with their variations of emotional regulation strengths and deficits.

Conclusion and Limitations

Due to both the cross-sectional design of our study, as well as the use of correlations, further conclusions regarding the directionality of the investigated variables and their relationships can be made, nor have an indication of time related behavior development and progression. In addition, the formation of our bingeing groups was predicated on a binge drinking standard that indicates heavier or more severe drinking. The traditional threshold for binge drinking is 4 or more/5 or more drinks for females and males respectively. The set standard of 6+ drinks might show a more severe pathology of drinking behaviors compared to other samples. The threshold for binge drinking was set at 6+ drinks as opposed to 4 or more for females, our findings may be more closely

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

related to White, Anderson, Ray, and Mun (2016) research where they found that extreme binge drinkers compared to non-binge drinkers and binge drinkers were more likely to drink for social, enhancement and coping motives. This criterion of 6+ drinks may explain the stronger influence of binge drinking pathology on the observed results (i.e. severity). Future research regarding binge drinking should develop a measurement of binge drinking that assesses multiple facets of problematic alcohol use including multiple time frames, frequency of consumption, and use of a general standardized measurement of binge drinking. In addition, our study only used an all-female sample, further research should replicate these findings in a male population. Based on our all-female, mostly white sample, and the fact that data was collected from college students, generalizations regarding the findings and conclusions should be taken into consideration for other populations. This sample was not derived from clinical populations of BN, BED, or AUD's individuals like the those in Rotella et al. (2018). Our results may demonstrate differences to other studies that have used both male and female samples as well (Trojanowski et al., 2019). Additionally, the lack of statistical power present in the personality, emotional regulation, and drunkorexia MANOVAs could have resulted in the inability to detect small-to-medium differences between the groups. Future studies should aim to increase sample size and thus statistical power.

This research adds clinical and public health implications for understanding symptomology differences in groups of binge eaters and drinkers, and further considers where shared binging symptoms occur with motivations and emotional regulation difficulties. These findings demonstrate a need to assess comorbid binge eating and drinking individuals as a multi-faceted profile of behavior, that includes symptoms of

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

both disordered eating behavior and problematic alcohol use. An approach to dealing with these individuals should keep both sets of symptomologies in mind and understand how these individuals differ from the other pathology groups and how they are similar.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

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BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Tables and Figures.

Table 1. *Participant Demographics*

	<i>n (M)</i>	<i>% (SD)</i>
Age	(2.54)	(1.202)
Gender		
Female	127	90.7
Male	13	9.3
Ethnicity		
Caucasian	115	90.6
African American	2	1.6
Asian/Asian American	3	2.4
Latina/Latin American	7	5.5
Native-American	6	4.7

Note. *N* = 140 for gender and age, *N* = 127 for ethnicity

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Table 2. *Descriptive statistics for all study outcome variables*

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	Possible Range	Actual Range	Cronbach's α
Negative Affect						
Depression	124	6.67	8.06	0-56	0-39	.953
Anxiety	124	6.17	6.16	0-56	0-26	.874
Stress	123	9.50	7.50	0-56	0-31	.909
Personality Dimensions						
Openness	126	32.58	6.04	10-50	16-46	.777
Conscientiousness	121	33.37	5.81	9-45	13-45	.817
Extraversion	123	25.20	6.91	8-40	9-40	.874
Agreeableness	123	36.06	5.56	9-45	17-45	.83
Neuroticism	120	25.5	5.85	8-40	13-37	.803
Emotion Regulation						
Negative-Emotion	120	48.60	18.16	16-112	16-97	.917
Positive-Emotion	122	30.30	12.72	16-112	16-77	.902
Hedonic Goals	119	58.07	21.76	20-140	20-121	.93
Positive-Containing	123	20.63	9.20	12-84	12-53	.893
General	117	78.83	27.82	32-224	32-174	.937
Impulsivity (BIS-11)	120	68.64	7.81	30-120	49-86	.68
Motivations						
DMQ Social	126	14.49	5.57	5-25	5-25	.919
DMQ Coping	123	9.65	4.81	5-25	5-23	.887
DMQ Enhancement	122	12.27	4.85	5-25	5-24	.853
DMQ Conformity	124	7.08	3.1	5-25	5-19	.789
Drunkorexia Motives	121	13.93	4.93	11-55	11-33	.854
Drunkorexia Behaviors	125	19.73	10.06	12-60	12-55	.948

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Table 3.

Correlations among variables for the DASS questionnaire.

	1	2	3	4	5
1. Binge Eating	1				
2. Binge Drinking	.010	1			
3. Depression	.204*	-.003	1		
4. Anxiety	.323**	-.054	.588**	1	
5. Stress	.333**	-.026	.646**	.783**	1

** . $p < 0.01$

* . $p < 0.05$

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Table 4.

Correlations among emotional regulation variables from the PERCI and BIS-11 scales.

	1	2	3	4	5	6	7	8
1. Binge Eating	1							
2. Binge Drinking	.010	1						
3. Negative Emotion	.246*	.099	1					
4. Positive Emotion	.036	.079	.625**	1				
5. Hedonic	.219*	.060	.986**	.703**	1			
6. Positive Containing	-.010	.150	.491**	.944**	.528**	1		
7. General	.191	.103	.933**	.865**	.959**	.746**	1	
8. Impulsivity	.318**	.082	.277**	.230*	.241*	.242*	.276**	1

** . $p < 0.01$

* . $p < 0.05$

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Table 5.
Correlations for variables of the BFI scale.

	1	2	3	4	5	6	7
1. Binge Eating	1						
2. Binge Drinking	.010	1					
3. Openness	.173	-.087	1				
4. Conscientiousness	-.133	-.196*	-.048	1			
5. Extraversion	-.108	.217*	.244**	.169	1		
6. Agreeableness	-.093	-.233**	.061	.349**	-.067	1	
7. Neuroticism	.119	.003	.068	-.353**	-.308**	-.326**	1

** . $p < 0.01$

* . $p < 0.05$

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Table 6. *Differences between binge groups on the DMQ-R subscales*

Motives	Binge eating (<i>n</i> = 10)		Binge drinking (<i>n</i> = 49)		Combined (<i>n</i> = 23)		Controls (<i>n</i> = 32)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Social	10.20 ^{2,3}	5.53	16.20 ^{1,4}	3.67	17.91 ^{1,4}	3.69	9.66 ^{2,3}	5.03
Coping	6.20 ^{2,3}	1.62	9.87 ^{1,4}	4.23	10.90 ^{1,4}	4.25	7.03 ^{2,3}	4.02
Enhancement	8.50 ^{2,3}	4.53	13.57 ^{1,4}	3.49	14.56 ^{1,4}	4.02	8.31 ^{2,3}	4.02
Conformity	5.80	1.87	6.94	2.46	6.02	2.23	6.67	1.85

¹ = Binge eating significant results

² = Binge drinking significant results

³ = Combined significant results

⁴ = Controls significant results

With alpha = .05 with Bonferroni adjustments

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Table 7. *Differences between binge groups on drunkorexia subscales*

	Binge eating (<i>n</i> = 9)		Binge drinking (<i>n</i> = 48)		Combined (<i>n</i> = 20)		Controls (<i>n</i> = 32)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Motivations	11.39	1.72	12.96	2.82	14.33 ⁴	4.31	11.78 ³	2.93
Behaviors	14.44 ³	4.19	18.00 ^{3,4}	7.00	24.95 ^{1,2,3}	9.24	13.41 ^{2,3}	4.11

¹ = Binge eating significant results

² = Binge drinking significant results

³ = Combined significant results

⁴ = Controls significant results

Alpha = .05 after Bonferroni adjustments

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Table 8. *Differences between binge groups on the DASS subscales*

	Binge eating (<i>n</i> = 10)		Binge drinking (<i>n</i> = 50)		Combined (<i>n</i> = 23)		Controls (<i>n</i> = 30)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Depression	2.63	1.85	1.75	1.49	2.61	1.59	1.78	1.19
Anxiety	2.67	1.23	1.76 ³	1.11	2.68 ²	1.35	2.00	1.23
Stress	3.55	1.25	2.55	1.26	3.16	1.53	2.70	1.23

¹ = Binge eating significant results

² = Binge drinking significant results

³ = Combined significant results

⁴ = Controls significant results

Alpha = .05 after Bonferroni adjustments

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Table 9. *Differences between binge groups on BFI*

Traits	Binge eating (<i>n</i> = 10)		Binge drinking (<i>n</i> = 50)		Combined (<i>n</i> = 17)		Controls (<i>n</i> = 32)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Openness	36.33	5.57	31.61	5.78	32.00	6.07	32.84	5.35
Conscientiousness	31.56	1.71	33.41	5.34	33.73	4.61	35.77	5.22
Extraversion	26.67	6.45	27.61 ⁴	6.07	22.27	6.21	22.88 ²	7.48
Agreeableness	37.83	3.54	35.81	5.40	34.91	5.91	38.68	4.12
Neuroticism	25.33	5.35	24.05	6.19	23.55	6.79	24.72	5.83

¹ = Binge eating significant results

² = Binge drinking significant results

³ = Combined significant results

⁴ = Controls significant results

Alpha = .05 after Bonferroni adjustments

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Table 10. *Differences between binge groups on the PERCI subscales and BIS-11*

Regulation	Binge eating (n = 9)		Binge drinking (n = 52)		Combined (n = 19)		Controls (n = 29)	
	M	SD	M	SD	M	SD	M	SD
Negative*	56.80	11.31	46.42	18.32	54.65 ⁴	14.16	41.67 ³	16.43
Positive	31.10	10.91	30.02	12.61	32.80	14.28	28.17	10.18
Hedonic*	67.80	13.47	55.15	21.85	65.90	18.00	50.93	19.64
Positive Cont.	20.1	8.29	21.29	8.88	21.55	10.44	18.9	7.77
General	87.90	18.69	76.44	27.33	87.45	25.68	69.83	24.78
Impulsivity*	71.67	8.82	68.61	7.33	72.09 ⁴	7.02	66.28 ³	7.53

¹ = Binge eating significant results

² = Binge drinking significant results

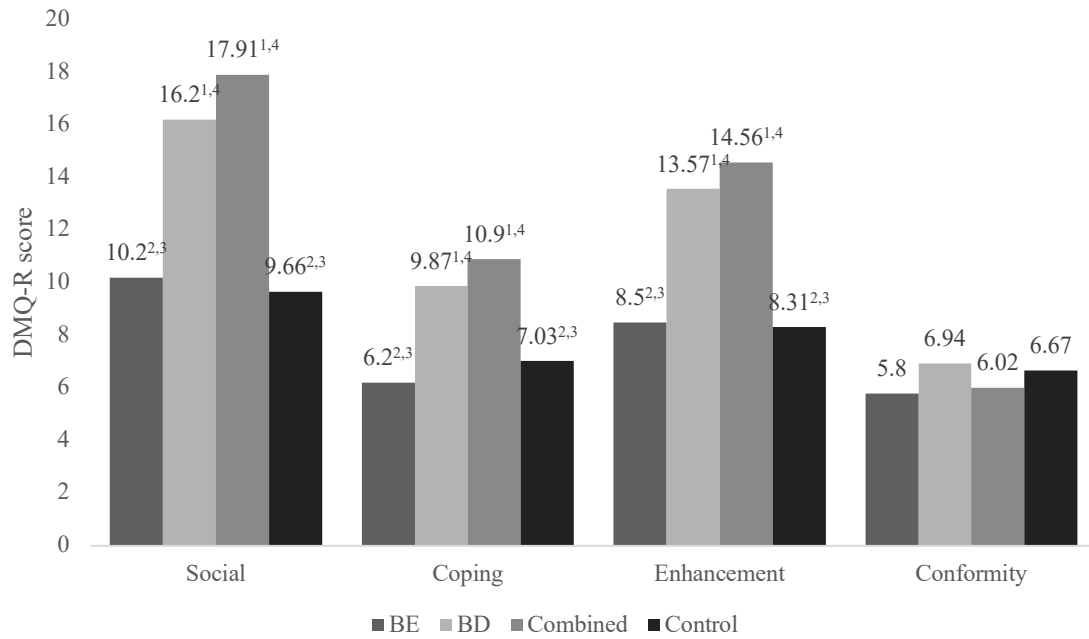
³ = Combined significant results

⁴ = Controls significant results

Alpha = .05 after Bonferroni adjustments

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

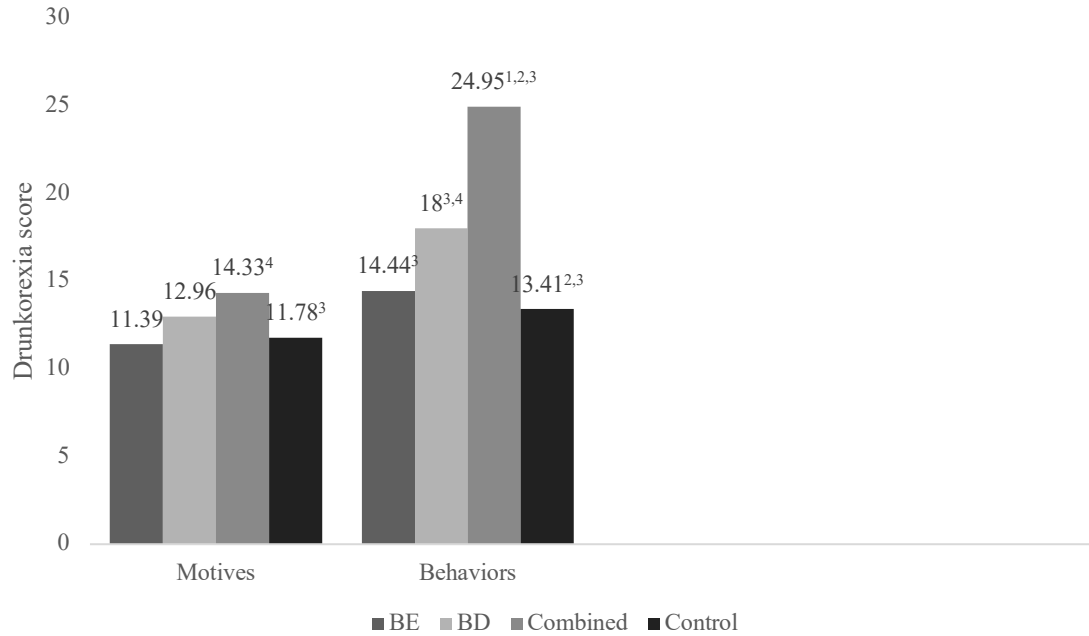
Figure 1. *DMQ-R mean scores for binge classes*



Note. ¹ = Binge eating significant results, ² = binge drinking significant results, ³ = combined significant results, ⁴ = controls significant results, with alpha = .05 with Bonferroni adjustments.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Figure 2. *Drunkorexia mean scores for binge classes*



Note. ¹ = Binge eating significant results, ² = binge drinking significant results, ³ = combined significant results, ⁴ = controls significant results, with alpha = .05 with Bonferroni adjustments.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

**Appendix A:
Informed Consent**

**UNIVERSITY OF NORTH DAKOTA
Institutional Review Board
Study Information Sheet**

Title of Project: **Binging Behaviors and Emotional Regulation in Young Adults**

Principal Investigator: *Michelle J. Duffy, Michelle.J.Duffy@und.edu*

Co-Investigator(s): *F. Richard Ferraro, 701-777-2414,
F.Richard.Ferraro@und.edu*

Advisor: *F. Richard Ferraro, 701-777-2414,
F.Richard.Ferraro@und.edu*

Purpose of the Study:

The purpose of this research study is to explore co-occurrences of binging behaviors in young adults and to determine what psychological variables are associated with binging behaviors occurring together as well as alone. Binging behavior specifically as it is manifested in drinking is problematic among the college population. Multiple health concerns arise from binge drinking, including risks for alcohol poisoning, risky sexual behavior, and other injuries. In addition, binging behavior as it associated with eating can cause psychological distress and is thought to be the result of negative coping skill in students who are dealing with stress from being in school, being away from home, or the attempt to adhere to societal beauty standards. Engaging in compensatory behaviors after a “binge” can be physically damaging to organs (ie. vomiting) and emotionally distressing. Past research has show that both of these binging populations are associated with earlier deaths and a lower quality of life as well as numerous long-term health effects. The need to address the psychological determinants involved in binging behaviors is crucial to understanding what young adults are at risk for potentially developing problematic binging behaviors as well as to understand the underlying mechanisms of exisiting binging behaviors.

Procedures to be followed:

After reviewing the consent form, you will be asked to answer 250 questions on a survey. The survey will take approximately 60 minutes to complete. There will be two exclusion criteria questions you must answer to determine your eligibility for the study. All answers are anonymous.

Risks:

There are no risks in participating in this research beyond those experienced in everyday life. Some of the questions are personal and might cause discomfort. If you would like to talk to someone about your feelings regarding this study, you are encouraged to contact

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

The University of North Dakota's Counseling Center at 701-777-2127 or the Psychological Services Center 701-777-23691 which provides counseling services to UND students at no charge.

Benefits:

You might learn more about yourself by participating in this study. You may acquire a better understanding of how your behaviors impact your life and may find some of the questions are more or less pertinent to your own mental health standing.

Duration:

It will take approximately 60 minutes to complete all of the survey questions.

Statement of Confidentiality:

The survey and questionnaires do not ask for any information that would identify you personally to your responses. Therefore, your responses are recorded anonymously. If this research is published, no information that would identify you will be included since your name is in no way linked to your responses. All data collected from this survey will only be accessed by the individual's names on the consent form.

All survey responses that we receive will be treated confidentially and stored on a secure server. However, given that the surveys can be completed from any computer (e.g., personal, work, school), we are unable to guarantee the security of the computer on which you choose to enter your responses. As a participant in our study, we want you to be aware that certain "key logging" software programs exist that can be used to track or capture data that you enter and/or websites that you visit.

Right to Ask Questions:

The researchers conducting this study are Michelle J. Duffy and Dr. F. Richard Ferraro. If you have questions, concerns, or complaints about the research please contact Michelle J. Duffy at (701) 777-3326 or Dr. F. Richard Ferraro at (701) 777-2414 during the day.

If you have questions regarding your rights as a research subject, you may contact The University of North Dakota Institutional Review Board at (701) 777-4279 or UND.irb@UND.edu. You may the UND IRB with problems, complaints, or concerns about the research. Please contact the UND IRB if you cannot reach research staff, or you wish to talk with someone who is an informed individual who is independent of the research team.

General information about being a research subject can be found on the Institutional Review Board website "Information for Research Participants"

<http://und.edu/research/resources/human-subjects/research-participants.cfm>

Compensation:

As a participant you will receive 1 SONA credit hours towards your respective psychology course. This credit will be rewarded within 48 hours of the survey completion.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Voluntary Participation:

You do not have to participate in this research. You can stop your participation at any time. You may refuse to participate or choose to discontinue participation at any time without losing any benefits to which you are otherwise entitled.

You do not have to answer any questions you do not want to answer.

You must be 18 years of age older to participate in this research study.

Completion and submission of this survey implies that you have read the information in this form and consent to participate in the research.

Please keep this form for your records or future reference.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

**Appendix B:
Demographic Questionnaire**

1. What is your age?
 - 18
 - 19
 - 20
 - 21
 - 22
 - 23
 - 24
 - 25
 - 26 or older

2. What is your sex?
 - Male
 - Female
 - Non-Binary
 - Prefer not to respond

3. What is your Race/Ethnicity? (select all that apply)
 - White
 - Hispanic or Latino
 - Black or African American
 - Native American or American Indian
 - Asian or Pacific Islander
 - Other

4. Have you currently been diagnosed with an eating disorder or been diagnosed in the past?
 - Yes
 - No
 - Prefer not to answer

5. Have you ever taken any of the following substance? Select all that apply.
 - Alcohol
 - Inhalants
 - Sleep medication, tranquilizers, anxiolytics (i.e. Xanax)
 - Medical drugs and alcohol combined
 - Heroin and other opiates (pain killers)
 - GHB, GBL
 - Marijuana
 - Stimulants (i.e. ADHD medication, cocaine)
 - Hallucinogens and/or Psychedelics (i.e. mushrooms)

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

**Appendix C:
Binge Drinking Questions**

6. During the last 12 months, how often did you usually have any kind of drink containing alcohol? By a drink we mean half an ounce of absolute alcohol (eg. a 12 ounce can or glass of beer or cooler, a 5 ounce glass of wine, or a drink containing 1 shot of liquor). Choose only one.
- Every day
 - 5 to 6 times a week
 - 3 to 4 times a week
 - twice a week
 - once a week
 - 2 to 3 times a month
 - 3 to 11 times in the past year
 - 1 or 2 times in the past year
 - I did not drink any alcohol in the past year, but I did drink in the past
 - I never drank any alcohol in my life
7. During your lifetime, what is the maximum numbers of drinks containing alcohol that you drank within a 24-hour period?
- 36 drinks or more
 - 24 to 35 drinks
 - 18 to 23 drinks
 - 12 to 17 drinks
 - 8 to 11 drinks
 - 5 to 7 drinks
 - 4 drinks
 - 3 drinks
 - 2 drinks
 - 1 drink
8. During the last 12 months, how many alcoholic drinks did you have on at typical day when you drank alcohol?
- 25 or more drinks
 - 19 to 24 drinks
 - 16 to 18 drinks
 - 12 to 15 drinks
 - 9 to 11 drinks
 - 7 to 8 drinks
 - 5 to 6 drinks
 - 3 to 4 drinks
 - 2 drinks
 - 1 drink

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

9. During the last 12 months, what is the largest number of drinks containing alcohol that you drank within 24-hour period?
- 36 drinks or more
 - 24 to 35 drinks
 - 18 to 23 drinks
 - 12 to 17 drinks
 - 8 to 11 drinks
 - 5 to 7 drinks
 - 4 drinks
 - 3 drinks
 - 2 drinks
 - 1 drink
10. During the last 12 months, how often did you drink this largest number of drinks? Choose only one.
- Every day
 - 5 to 6 times a week
 - 3 to 4 times a week
 - twice a week
 - once a week
 - 2 to 3 times a month
 - once a month
 - 3 to 11 times in the past year
 - 1 or 2 times in the past year
11. During the last 12 months, how often did you have 5 or more (males) or 4 or more (females) drinks containing any kind of alcohol in within a two-hour period? [That would be the equivalent of at least 5 (4) 12-ounce cans or bottle of beer, 5 (4) five ounce glasses of wine, 5 (4) drinks each containing one shot of liquor or spirits.] Choose only one.
- Every day
 - 5 to 6 days a week
 - 3 to 4 days a week
 - two days a week
 - one day a week
 - 2 to 3 days a month
 - one day a month
 - 3 to 11 days in the past year
 - 1 or 2 days in the past year
12. During your lifetime, what is the largest number of drinks containing alcohol that you drank within a 24-hour period?

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

- o 36 drinks or more
- o 24 to 35 drinks
- o 18 to 23 drinks
- o 12 to 17 drinks
- o 8 to 11 drinks
- o 5 to 7 drinks
- o 4 drinks
- o 3 drinks
- o 2 drinks
- o 1 drink

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

**Appendix D:
Depression Anxiety Stress Scale (DASS)**

Please read each statement and indicate how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

13. I found myself getting upset by quite trivial things

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

14. I was aware of dryness of my mouth

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

15. I couldn't seem to experience any positive feeling at all

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

16. I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

17. I just couldn't seem to get going

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

18. I tended to over-react to situations

- Did not apply to me at all

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

19. I had a feeling of shakiness (e.g. legs going to give way)

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

20. I found it difficult to relax

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

21. I found myself in situations that made me so anxious I was most relieved when they ended

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

22. I felt that I had nothing to look forward to

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

23. I found myself getting upset rather easily

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

24. I felt that I was using a lot of nervous energy

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

25. I felt sad and depressed
- Did not apply to me at all
 - Applied to me to some degree, or some of the time
 - Applied to me a considerable degree, or a good part of time
 - Applied to me very much, or most of the time
26. I found myself getting impatient when I was delayed in any way (e.g. elevators, traffic lights, being kept waiting)
- Did not apply to me at all
 - Applied to me to some degree, or some of the time
 - Applied to me a considerable degree, or a good part of time
 - Applied to me very much, or most of the time
27. I had a feeling of faintness
- Did not apply to me at all
 - Applied to me to some degree, or some of the time
 - Applied to me a considerable degree, or a good part of time
 - Applied to me very much, or most of the time
28. I felt that I had lost interest in just about everything
- Did not apply to me at all
 - Applied to me to some degree, or some of the time
 - Applied to me a considerable degree, or a good part of time
 - Applied to me very much, or most of the time
29. I felt that I wasn't worth much as a person
- Did not apply to me at all
 - Applied to me to some degree, or some of the time
 - Applied to me a considerable degree, or a good part of time
 - Applied to me very much, or most of the time
30. I felt that I was rather touchy
- Did not apply to me at all
 - Applied to me to some degree, or some of the time
 - Applied to me a considerable degree, or a good part of time
 - Applied to me very much, or most of the time
31. I perspired noticeably (e.g. hands sweaty) in the absence of high temperatures or physical exertion

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

32. I felt scared without any good reason

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

33. I felt that life wasn't worthwhile

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

34. I found it hard to wind down

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

35. I had difficulty in swallowing

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

36. I couldn't seem to get any enjoyment out of the things I did

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

37. I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)

- Did not apply to me at all
- Applied to me to some degree, or some of the time

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

38. I felt down-hearted and blue

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

39. I found that I was very irritable

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

40. I felt that I was close to panic

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

41. I found it hard to calm down after something upset me

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

42. I feared that I would be "thrown" by some trivial but unfamiliar task

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

43. I was unable to become enthusiastic about anything

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

44. I found it difficult to tolerate interruptions to what I was doing

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

45. I was in state of nervous tension

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

46. I felt I was pretty worthless

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

47. I was intolerant of anything that kept me from getting on with what I was doing

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

48. I felt terrified

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

49. I could see nothing in the future to be hopeful about

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

50. I felt that life was meaningless

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

- Applied to me very much, or most of the time

51. I found myself getting agitated

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

52. I was worried about situations in which I might panic and make a fool of myself

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

53. I experienced trembling (e.g. in the hands)

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

54. I found it difficult to work up the initiative to do things

- Did not apply to me at all
- Applied to me to some degree, or some of the time
- Applied to me a considerable degree, or a good part of time
- Applied to me very much, or most of the time

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

**Appendix E:
Eating Disorder Diagnostic Scale (EDDS)**

Please carefully complete all questions, choosing NO or 0 for questions that do not apply.

Please rate based on the past 3 months.

Over the past 3 months...

- | | 0 | 1 | 2 | 3 | 4 | 5 |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 6 | | | | | | |
| 55. Have you felt fat? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | | | | | | |
| 56. Have you had a definite fear that you might gain weight or become fat? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | | | | | | |
| 57. Has your weight or shape influenced how you judge yourself as a person? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | | | | | | |
| 58. During the past 3 months have there been times when you have eaten what other people would regard as an unusually large amount of food (e.g. a pint of ice cream) given the circumstances? | | | | | | |
| <input type="radio"/> YES | | | | | | |
| <input type="radio"/> NO | | | | | | |
| 59. During the times when you ate an unusually large amount of food, did you experience a loss of control (e.g. felt you couldn't stop eating or control what or how much you were eating?) | | | | | | |
| <input type="radio"/> YES | | | | | | |
| <input type="radio"/> NO | | | | | | |
| 60. How many times per month on average over the past 3 months have you eaten an unusually large amount of food and experiences a loss of control? | | | | | | |
| <input type="radio"/> 1 | | | | | | |
| <input type="radio"/> 2 | | | | | | |
| <input type="radio"/> 3 | | | | | | |
| <input type="radio"/> 4 | | | | | | |
| <input type="radio"/> 5 | | | | | | |

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16+
- Does not apply

During episodes of overeating with a loss of control, did you...

61. Eat much more rapidly than normal?

- YES
- NO

62. Eat until you felt uncomfortably full?

- YES
- NO

63. Eat large amounts of food when you didn't feel physically hungry?

- YES
- NO

64. Eat alone because you were embarrassed by how much you were eating?

- YES
- NO

65. Feel disgusted with yourself, depressed, or very guilty after overeating?

- YES
- NO

66. If you have episodes of uncontrollable overeating, does it make you very upset?

- YES
- NO

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

In order to prevent weight gain or counteract the effects of eating, how many times per month on average over the past 3 months have you:

67. Made yourself vomit?

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16+
- Does not apply

68. Used laxatives or diuretics?

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16+
- Does not apply

69. Fasted (skipped at least 2 meals in a row)?

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16+
- Does not apply

70. Engaged in more intense exercise specifically to counteract the effects of overeating

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16+
- Does not apply

71. How many times per month on average over the past 3 months have you eaten after awakening from sleep or eaten an unusually large amount of food after your evening meal and felt distressed by the night eating?

- 1
- 2
- 3

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16+
- Does not apply

1 2 3 4 5 6

7

72. How much do eating or body image problems impact your relationships with friends and family, work performance, and school performance?

-
-

73. How much do you weigh? If uncertain, please give your best estimate.
Please list in lbs _____

74. How tall are you?
Please list in inches _____

75. What is your highest weight at your current height?
Please list in lbs _____

76. What is your sex?

- Male
- Female

77. What is your age? _____

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

**Appendix F:
Alcohol Use Disorder Identification Test (AUDIT)**

Because alcohol use can affect your health and can interfere with certain medications and treatments, it is important that we ask some questions about your use of alcohol. Your answers will remain confidential so please be honest. Choose the box that best describes your answer to each question.

78. How often do you have a drink containing alcohol?

- Never
- Monthly or less
- 2-4 times a month
- 2-3 times a week
- 4 or more times a week

79. How many drinks containing alcohol do you have on atypical day when you are drinking?

- 1 or 2
- 3 or 4
- 5 or 6
- 7 to 9
- 10 or more

80. How often do you have six or more drinks on one occasion?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

81. This is an attention check: please select weekly as your answer.

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

82. How often during the last year have you found that you were not able to stop drinking once you started?

- Never
- Less than monthly

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

- Monthly
- Weekly
- Daily or almost daily

83. How often during the last year have you failed to do what was normally expected of you because of drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

84. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

85. How often during the last year have you had a feeling of guilt or remorse after drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

86. How often during the last year have you been unable to remember what happened the night before because of your drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

87. Have you or someone else been injured because of your drinking?

- No
- Yes, but not in the last year
- Yes, during the last year

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG
ADULTS

88. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?
- No
 - Yes, but not in the last year
 - Yes, during the last year

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

**Appendix G:
Barratt Impulsiveness Scale (BIS-11)**

People differ in the ways they act and think in different situations. This is a test to measure some of the way in which you act and think. Read each statement and put an X on the appropriate circle on the right side of this page. Do not spend too much time on any statement. Answer honestly.

1 = Rarely/Never, 2 = Occasionally, 3 = Often, 4 = Almost Always/Always

	1	2	3	4
I plan tasks carefully.				<input type="radio"/>
I do things without thinking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I make-up my mind quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am happy-go-lucky	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't "pay attention."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have "racing" thoughts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I plan trips well ahead of time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am self-controlled.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I concentrate easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I save regularly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I "squirm" at plays or lectures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am a careful thinker.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like to think about complex problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I change jobs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I act "on impulse"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get easily bored when solving thought problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I act on the spur of the moment.				<input type="radio"/>

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

I am a steady thinker.

I change residences.

I buy things on impulse.

I can only think about one thing at a time.

I change hobbies.

I spend or charge more than I earn.

I often have extraneous thoughts when thinking.

I am more interested in the present than the future.

I am restless at the theater or lectures.

I like puzzles.

I am future oriented.

I plan for job security.

I say things without thinking.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

**Appendix H:
Binge Eating Scale (BES)**

Below are groups of numbered statements. Read all of the statements in each group and mark on this sheet the one that best describes the way you feel about the problems you have controlling your eating behavior.

89.

- I don't feel self-conscious about my weight or body size when I'm with others.
- I feel concerned about how I look to others, but it normally does not make me feel disappointed with myself.
- I do get self-conscious about my appearance and weight which makes me feel disappointed in myself.
- I feel very self-conscious about my weight and frequently, I feel intense shame and sighs for myself. I try to avoid social contacts because of my self-consciousness.

90.

- I don't have any difficulty eating slowly in the proper manner.
- Although I seem to "gobble down" foods, I don't end up feeling stuffed because of eating too much.
- At times, I tend to eat quickly and then, I feel uncomfortably full afterwards.
- I have the habit of bolting down my food, without really chewing it. When this happens I usually feel uncomfortably stuffed because I've eaten too much.

91.

- I feel capable to control my eating urges when I want to.
- I feel like I have failed to control my eating more than the average person.
- I feel utterly helpless when it comes to feeling in control of my eating urges.
- Because I feel so helpless about controlling my eating I have become very desperate about trying to get in control.

92.

- I don't have the habit of eating when I'm bored.
- I sometimes eat when I'm bored, but often I'm able to "get busy" and get my mind off food.
- I have a regular habit eating when I'm bored, but occasionally, I can use some other activity to get my mind off eating.
- I have a strong habit of eating when I'm bored. Nothing seems to help me break the habit.

93.

- I'm usually physically hungry when I eat something.
- Occasionally, I eat something on impulse even though I really am not hungry.
- I have the regular habit of eating foods, that I might not really enjoy, to satisfy a hungry feeling even though physically, I don't need the food.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

- o Even though I'm not physically hungry, I get a hungry feeling in my mouth that only seems to be satisfied when I eat a food, like a sandwich, that fills my mouth. Sometimes, when I eat the food to satisfy my mouth hunger, I then spit the food out so I won't gain weight.
- 94.
- o I don't feel any guilt or self-hate when I overeat.
 - o After I overeat, occasionally I feel guilt or self-hate.
 - o Almost all the time I experience strong guilt or self-hate after I overeat.
- 95.
- o I don't lose total control of my eating when dieting even after periods when I overeat.
 - o Sometimes when I eat a "forbidden food" on a diet, I feel like I "blew it" and eat even more.
 - o Frequently, I have the habit of saying to myself, "I've blown it now, why not go all the way" when I overeat on a diet. When that happens I eat even more.
 - o I have a regular habit of starting strict diets for myself, but I break the diets by going on an eating binge. My life seems to be either a "feast" or "famine."
- 96.
- o I rarely eat so much food that I feel uncomfortable stuff afterwards.
 - o Usually about once a month, I eat such a quantity of food, I end up feeling very stuffed.
 - o I have regular periods during the month when I eat large amounts of food, either at mealtime or at snacks.
 - o I eat so much food that I regularly feel quite uncomfortable after eating an sometimes a bit nauseous.
- 97.
- o My level of calorie intake does not go up very high or go down very low on a regular basis.
 - o Sometimes after I overeat, I will try to reduce my caloric intake to almost nothing to compensate for the excess calories I've eaten.
 - o I have a regular habit of overeating during the night. It seems that my routine is not to be hungry in the morning but overeat in the evening.
 - o In my adult years, I have week-long periods when I overeat. It seems I live a life of either "feast" or "famine."
- 98.
- o I usually am able to stop eating when I want to. I know when "enough is enough."
 - o Every so often, I experience a compulsion to eat which I can't seem to control.
 - o Frequently, I experience strong urges to eat which I seem unable to control, but at other times I can control my eating urges.
 - o I feel incapable of controlling urges to eat. I have a fear of not being to stop eating voluntarily.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

99.

- I don't have any problem stopping eating when I feel full.
- I usually can stop eating when I feel full but occasionally overeat leaving me feeling uncomfortably stuffed.
- I have a problem stopping eating once I start and usually I feel uncomfortably stuffed after I eat a meal.
- Because I have a problem not being able to stop eating when I want, I sometimes have to induce vomiting to receive my stuffed feeling.

100.

- I seem to eat just as much when I'm with others (family, social gatherings) as when I'm by myself.
- Sometimes, when I'm with other persons, I don't eat as much as I want to eat because I'm self-conscious about my eating.
- Frequently, I eat only a small amount of food when others are present, because I'm very embarrassed about my eating.
- I feel so ashamed about overeating that I pick times to overeat when I know one one will see me. I feel like a "closet eater."

101.

- I eat three meals a day with only an occasional between meal snack.
- I eat 3 meals a day, but I also normally snack between meals.
- When I am snacking heavily, I get in the habit of skipping regular meals.
- There are regular periods when I seem to be continually eating, with no planned meals.

102.

- Do not select this answer.
- Select this answer if you are paying attention!
- Not this one!
- This is not the right answer to choose.

103.

- I don't think much about trying to control unwanted eating urges.
- At least some of the time, I feel my thoughts are pre-occupied with trying to control my eating urges.
- I feel that frequently I spend much time thinking about how much I ate or about trying not to eat anymore.
- It seem to see that most of my waking hours are pre-occupied by thoughts about eating or not eating. I feel like I'm constantly struggling not to eat.

104.

- I don't think about food a great deal.
- I have strong cravings for food but they last for only brief periods of time.
- I have days when I can't seem to think about anything else but food.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

- o Most of my days seem to be pre-occupied with thoughts about food. I feel like I live to eat.

105.

- o I usually know whether or not I'm physically hungry. I take the right portion of food to satisfy me.
- o Occasionally, I feel uncertain about knowing whether or not I'm physically hungry. At these times it's hard to know how much food I should take to satisfy me.
- o Even though I might know how many calories I should eat, I don't have any idea what is a "normal" amount of food for me.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

**Appendix H:
Drunkorexia Motives and Behaviors Scale**

Directions:

Think about the times you have restricted your calories or food intake because you were planning to drink alcohol later that day. How often would you say that you restricted your calories for each of the following reasons?

On a day I planned to drink, I controlled my eating:

never / almost never / sometimes / almost-always / always
o o o o o

Because my friends pressure me to restrict my eating

o o o o o

Because my friends encourage me to restrict my calories

o o o o o

Because it helps you enjoy a party

o o o o o

Because it makes social gathering more fun

o o o o o

So that I can drink without feeling left out

o o o o o

So that others won't make fun of me for not drinking

o o o o o

To fit in with a group I like

o o o o o

So that I would get high when I drank

o o o o o

Because my friends restrict their calories

o o o o o

To be liked

o o o o o

Because it's fun

o o o o o

So that I wouldn't gain weight

o o o o o

By eating less all day

o o o o o

To keep my caloric level under a certain level

o o o o o

By eating less fat

o o o o o

By exercising before I drank

o o o o o

By avoiding fatty foods

o o o o o

And made sure that I exercised/burned calories

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

By eating less at each meal

By exercising before I drank

So that I won't feel guilty about calories content of my drinks

To save calories for alcohol

To deal with my anxiety about the calories in alcohol

Thinking of all the times you drink, how often would you say that you drink for each of the following reasons?

almost never/never/some of the time/half of the time/most of the time/always/always

To forget your worries

Because your friends pressure you to drink

Because it helps you enjoy a party

Because it helps you when you feel depressed or nervous

To be sociable

To cheer up when you are in a bad mood

Because you like the feeling

So that others won't kid you about not drinking

Because it's exciting

To get high

Because it makes social gatherings more fun

To fit in with a group you like

Because it gives you a pleasant feeling

Because it improves parties and celebrations

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

- Because you feel more self-confident and sure of yourself
- To celebrate a special occasion with friends
- To forget about your problems
- Because it's fun
- To be liked
- So you won't feel left out
-

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

**Appendix I:
Big Five Inventory (BFI)**

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please select a number next to each statement to indicate the extent to which you agree or disagree with that statement.

Disagree strongly/Disagree a little/Neither agree nor disagree/Agree a little/Agree strongly

Is talkative

Tends to find fault with others

Does a thorough job

Is depressed, blue

Is original, comes up with new ideas

Is reserved

Is helpful and unselfish with others

Can be somewhat careless

Is relaxed, handles stress well

Is curious about many different things

Is full of energy

Starts quarrels with others

Is a reliable worker

Can be tense

Is ingenious, a deep thinker

Generates a lot of enthusiasm

Has a forgiving nature

Tends to be disorganized

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Worries a lot

Has an active imagination

Tends to be quiet

Is generally trusting

Tends to be lazy

Is emotionally stable, not easily upset

Is inventive

Has an assertive personality

Can be cold and aloof

Perseveres until the task is finished

Can be moody

Values artistic, aesthetic experiences

Is sometimes shy, inhibited

Is considerate and kind to almost everyone

Does things efficiently

Remains calm in tense situations

Prefers work that is routine

Is outgoing, sociable

Is sometimes rude to others

Makes plans and follows through with them

Gets nervous easily

Likes to reflect, play with ideas

Has few artistic interests

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

Likes to cooperate with others

Is easily distracted

Is sophisticated in art, music or literature

Select agree strongly if you are paying attention.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

**Appendix J:
Perth Emotion Regulation Competency Scale (PERCI)**

This questionnaire asks about how you manage and respond to your emotions. Please score the following statements according to how much you agree or disagree that the statement is true of you. Circle one answer for each statement.

The first half of the questionnaire asks about bad or unpleasant emotions, this means emotions like sadness, anger, or fear. The second half asks about good or pleasant emotions, this means emotions like happiness, amusement, or excitement.

Strongly disagree		Neither agree nor disagree		Strongly agree
○	○	○	○	○

When I'm feeling bad (feeling an unpleasant emotion), I don't know what to do to feel better.

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, those feelings stop me from getting work done.

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, I do stupid things.

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, I believe I need to get rid of those feelings at all costs.

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, I'm powerless to change how I'm feeling.

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, I can't complete tasks that I'm meant to be doing.

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, my behavior becomes out of control.

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, I can't allow those feelings to be there.

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, I don't have many strategies (e.g., activities or techniques) to help get rid of that feeling.

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, I can't get motivated to do important things (work, chores, school etc.).

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, I have trouble controlling my actions.

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, I must try to totally eliminate those feelings.

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, I have no control over the strength and duration of that feeling.

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, I have trouble getting anything done.

○ ○ ○ ○ ○ ○ ○

When I'm feeling bad, I have strong urges to do risky things.

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG ADULTS

o o o o o o o
When I'm feeling bad, I believe those feelings are unacceptable.

o o o o o o o
When I'm feeling good (feeling a pleasant emotion), I do stupid things.

o o o o o o o
When I'm feeling good, I don't have many strategies (e.g., activities or techniques) to increase the strength of that feeling.

o o o o o o o
When I'm feeling good, I have trouble completing tasks that I'm meant to be doing.

o o o o o o o
When I'm feeling good, part of me hates those feelings.

o o o o o o o
When I'm feeling good, my behavior becomes out of control.

o o o o o o o
I don't know what to do to create pleasant feelings in myself.

o o o o o o o
When I'm feeling good, I end up neglecting my responsibilities (work, chores, school etc.).

o o o o o o o
When I'm feeling good, I can't allow those feelings to be there.

o o o o o o o
When I'm feeling good, I have strong urges to do risky things.

o o o o o o o
When I'm feeling good, I have no control over whether that feeling stays or goes.

o o o o o o o
When I'm feeling good, I have difficulty staying focused during important stuff (at work or school, etc.).

o o o o o o o
When I'm feeling good, I believe those feelings are unacceptable.

o o o o o o o
When I'm feeling good, I can't keep control over myself (in terms of my behaviors).

o o o o o o o
When I'm feeling good, I don't have any useful ways to help myself keep feeling that way.

o o o o o o o
When I'm feeling good, I have trouble getting anything done.

o o o o o o o
When I'm feeling good, I must try to eliminate those feelings.

o o o o o o o

BINGING BEHAVIORS AND EMOTIONAL REGULATION IN YOUNG
ADULTS

**Appendix J:
Study Conclusion**

If you should want to seek emotional support and/or advice after completing this survey, please consider these services which are readily available for UND students and are confidential.

Psychological Services Center

(701) 777-3691

UND Counseling Center

(701) 777-2127