ABSTRACT

COMPARING DRUNKOREXIA ACROSS ATHLETES AND NON-ATHLETES

by Marina E. Galante

Drunkorexia is known as the use of disordered eating strategies in response to or in preparation for future alcohol use (Rahal, Bryant, Darkes, Menzel, & Thompson, 2012). The aim of the current study is to assess the relationship between drunkorexia, athlete status, and sport type. Participants were 295 college students (82 male and 213 female) from a mid-sized Midwestern university. Students participated in an online survey that included items assessing alcohol consumption, the Rutgers Alcohol Problem Index (RAPI), the Eating Attitudes Test-26 (EAT-26), and the Compensatory Eating and Behaviors in Response to Alcohol Consumption Scale (CEBRACS). Student-athletes had significantly lower EAT-26 and CEBRACS scores than non-athletes; RAPI scores did not significantly differ between the two groups. Certain sport athletes differed concerning CEBRACS diet/exercise subscales, EAT diet, and EAT total scores. Aesthetic athletes may be more susceptible to the combination of alcohol consumption and disordered eating practices than other sport athletes.
COMPARING DRUNKOREXIA ACROSS ATHLETES AND NON-ATHLETES

A Thesis

Submitted to the
Faculty of Miami University
in partial fulfillments of
the requirements for the degree of
Master of Science
Department of Kinesiology and Health

by
Marina Elizabeth Galante
Miami University
Oxford, OH
2015

Advisor _____________________
Rose Marie Ward, Ph.D.
Reader _____________________
Robert Weinberg, Ph.D.
Reader _____________________
Ronald Cox, Ph.D.
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Comparing Drunkorexia across Athletes and Non-Athletes

A recent phenomenon labeled drunkorexia has been occurring across college campuses (CBS, 2008). Drunkorexia is most simply known as the use of disordered eating strategies in response to or in preparation for future alcohol use (Rahal, Bryant, Darkes, Menzel, & Thompson, 2012). The high rates of both alcohol consumption and disordered eating in collegiate athletes and non-athletes suggest that both populations may be at risk for developing this maladaptive behavioral pattern. However, a strong relation between physical activity and drunkorexia as well as high rates of alcohol misuse in athletes may lead athletes to use drunkorexia more often than their non-athlete peers. The purpose of the present study is to compare the prevalence of drunkorexia and drinking behaviors across collegiate athletes and non-athletes.

Alcohol and College Students

Early adulthood years are often a time of exploration and self-discovery (Erikson, 1968). For most students, college marks the first time living away from parents, and signifies a newfound independence. The new autonomy students experience allows them to begin making important decisions on their own. However, decisions of early adults are largely influenced by their peers, especially concerning risky behaviors (Gardner & Steinberg, 2005). Young adult peer influence paired with the accessibility of alcohol on college campuses leads to alcohol consumption as a continual issue among college students.

Alcohol consumption is more prevalent on college campuses than in any other concentrated area (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). Data from the National Survey on Drug Use and Health (NSDUH) and the Monitoring the Future (MTF) survey estimate that roughly 65% of college students drink alcohol in a given month (SAMHSA, 2011). College students not only drink more alcohol than their non-collegiate peers, but they also consume it more frequently and at a higher intensity (White & Hingson, 2014). In other words, college students consume significantly more alcohol during each drinking episode. Often college students practice binge drinking, defined as consuming five and four drinks in one evening in males and females, respectively (White & Hingson, 2014). The rates of binge drinking in college students has stayed unchanging from 2002 to 2010 at 44%, while the rates of binge drinking in
18 to 24 year olds not enrolled in college has decreased from 39% in 2002 to 36% in 2010 (SAMHSA, 2011).

Binge drinking is not only problematic in that higher amounts of alcohol are consumed, but that negative consequences from alcohol increase exponentially. Alcohol use often precedes missed class, lowered grades, aggressive behaviors, injuries, sexual assaults, unprotected or nonconsensual sex, overdoses, memory loss, blacking out, and death (Burke, Creemeens, Vail-Smiith, & Woolsey, 2010; Hingson, Zha, & Weitzman, 2009; Pascarella et al., 2007). These consequences are intensified in binge drinkers and frequent binge drinkers, students who binge drink more than three times over a two-week period. Frequent binge drinkers are seven to ten times more likely to have unprotected and unexpected sex, break the law, and drive while intoxicated (Wechsler et al., 1994; 2002). Occasional binge drinkers are five times more likely to have alcohol-related consequences than nondrinkers, and frequent binge drinkers are 21 times more likely to have alcohol-related problems (Weschler et al., 2002). Furthermore, binge drinkers are more likely to have long-term consequences such as dropping out of college, working in lower paying jobs, and experiencing alcohol dependence ten years following college (Jennison, 2004).

Although these consequences are commonly experienced across all students using alcohol, women are significantly more vulnerable to alcohol-related consequences (Burke et al., 2010). Historically, males have drank alcohol more often and more heavily than females (White & Hingson, 2014). Males also show higher rates of binge drinking than females, and in 2011 the MTF survey estimated that 43% of males and 32% of females had binge-drank in the past two weeks. However, the gap is closing with regards to instances of drunkenness. In 1953, 80% of males and 49% of females reported being drunk at least once, and in 2011 68% of males and 68% of females had been drunk at some point in their lifetime (White & Hingson, 2014). The rates of binge drinking in females have increased since 1993 (Wechsler et al., 2002). Increased rates of binge drinking among females are problematic given that females are slower to metabolize alcohol and are more affected by alcohol than males (Burke et al., 2010). Thus, college-aged women are a population specifically at risk for alcohol-related consequences (Ward, Cleveland, & Messman-Moore, 2013).

Most young adults ignore alcohol-related consequences despite high prevalence and severity of these negative outcomes. Students even perceive that alcohol has more positive
consequences than negative ones (Lee, Patrick, Neighbors, Lewis, & Tollison, 2010). College students frequently report that alcohol is an escape from school, and a way to feel related to peers, be more sociable, and feel more relaxed (Lee et al., 2010; Park & Grant, 2005). These positive consequences are more frequently perceived by students who drink more often (Lee et al., 2010). There are no gender differences in perception of consequences; both male and female students report more positive consequences of alcohol than negative consequences (Patrick & Maggs, 2011). Moreover, both male and female students who identified more positive than negative consequences also drank alcohol on more days of the week and drank more on each drinking occasion (Patrick & Maggs, 2011). Even though a hangover is a commonly reported negative consequence of alcohol, some students even view a hangover as positive (Mallett, Marzell, Varvil-Weild, Turrisi, & Guttman, 2011). Thus, not one alcohol consequence was unanimously reported as negative by students. The positive views surrounding alcohol consumption serve to mask some of the dangerous outcomes of alcohol use.

The perception of positive alcohol consequences is likely due to the drinking culture that college produces. Many students believe that alcohol is vital to enhancing the college experience (Osberg, Insana, Eggert, & Billingsley, 2011). Osberg and colleagues (2011) found that personal beliefs about alcohol’s centrality in the college experience are related to expectations about alcohol, and injunctive and descriptive norms. Expectations about alcohol are identified as how students expect alcohol to enhance their college experience. Descriptive norms include perceptions of how much other students drink, and injunctive norms include perceptions of how often/how much drinking is acceptable within a certain group. When students had more positive alcohol expectancies, and higher descriptive and injunctive norms for alcohol, they consumed more drinks during a typical week and displayed more alcohol-related consequences. However, student perceptions of these consequences as positive further reinforce drinking behaviors, indicating a cycle of risky behavior and lack of cessation.

Alcohol centrality to the college experience is only one motivation for alcohol consumption. There are four distinct motives that influence drinking behaviors: social, coping, conformity, and enhancement motives (Cooper, 1994; Kuntsche, Knibbe, Gmel, & Engels, 2006). Social motives contend that individuals drink to earn social rewards, such as having fun or enjoying a party. Coping motives explain that students drink as compensation for negative emotions. Conformity motives influence drinking in that students seek acceptance and approval
by their peers through alcohol. Enhancement motives explain why students drink to improve mood. In the context of the competitive college setting, these motives can be used to explain why college students drink.

Certain motives are also related to alcohol consumption levels. Many social gatherings in college include alcohol, and many students drink either to have more fun or to cope with the uniquely rigorous atmosphere of collegiate academics (Cooper, 1994). Many college students perceive that other students drink more than they do in actuality, which influences their motives to drink as conformity to perceived college norms (Osberg et al., 2011). Although most college students begin drinking for social and conformity reasons, students begin to adopt coping and enhancement motives as they drink more often (Cooper, 1994). Coping and enhancement motives strongly relate to alcohol use and heavy drinking (Kuntsche et al., 2006). Coping and enhancement motives also coincide with poor self-care, academic and social problems, blackouts, and hazardous behaviors (Merill & Read, 2010). Thus, understanding why college students engage in drinking is crucial in understanding the high rates of alcohol consumption and alcohol-related consequences across college campuses.

**Alcohol and Collegiate Athletes**

Drinking is not only a problem among the entire university student body, but also among collegiate athletes. The nature of organized sport leads athletes to learn social skills from the beginning of their athletic careers (White & Hingson, 2014). These social skills are even more pronounced in team-sport athletes (Zamboaga, Rodriguez, & Horton, 2008). A 2001 sample indicated that athletes spent two more hours socializing than non-athletes (Nelson & Wechsler, 2001). Athletes also place more emphasis on social gatherings such as parties, which are a large source of alcohol in college. Furthermore, athletes perceive higher alcohol use among peers, and perceive their peers approve of hazardous drinking behaviors (Olthuis, Zamboanga, Martens, & Ham, 2011; Yusko, Buckman, White, & Pandina, 2008). Given the high level of peer influence among adolescents, this may help to explain collegiate athlete drinking behaviors.

Collegiate athletes not only drink more alcohol, but binge-drink more often than their non-athlete counterparts (Martens, Dams-O’Connor, & Beck, 2006; Martens, Watson, & Beck, 2006; Nelson & Wechsler, 2001; Zamboaga, Rodriguez, & Horton, 2008). Male athletes average 10 more instances of drinking per month than male non-athletes (Nelson & Wechsler, 2001). Athletes are also more likely than non-athletes to have 70% of friends who binge-drink (Nelson
& Wechsler, 2001). The norms surrounding binge drinking among athletes’ peers as well as athletes’ increased perception of alcohol use among others leads them to binge drink more often than their non-athlete peers. In a sample of 12,777 college students, only 43% of male and 36% of female non-athletes were characterized as binge-drinkers, but 61% of male and 50% of female athletes were binge drinkers (Nelson & Wechsler, 2001). Furthermore, 29% of male and 24% of female athletes were frequent binge drinkers, and only 18% of male and 15% of female non-athletes frequently binge drank. High frequency of athlete binge-drinking paired with their binge-drinking friends may allude to social motives for alcohol consumption.

Athlete use of social motives for drinking is fairly apparent. Zamboaga, Rodriguez, and Horton (2008) ascertain that athletic teams with more social events involving alcohol have higher team cohesion, participate in more drinking games, and have more dangerous alcohol behaviors. Athletes also have higher enhancement and coping drinking motives than non-athletes, and use little-to-no protective drinking behaviors (Yusko et al., 2008). These findings illustrate a distinct profile of athlete drinking behaviors apart from non-athletes. However, athlete drinking profiles may also be different between athletic teams, mediated by each team’s unique social norms about drinking that influence social events and drinking behaviors (Martens, Watson, & Beck, 2006; Zamboaga et al., 2008).

The idea that different sport teams have unique rates of drinking is supported throughout the literature. Martens, Watson, and Beck (2006) determined that different sport teams varied in terms of alcohol consumption. Results indicated that swimmers and divers drank significantly more alcohol than athletes of all other teams. An NCAA study in 2001 that considered both male and female teams indicated that women’s swimming and diving, women’s soccer, and women’s softball teams had the highest prevalence rates of alcohol use (Martens, Dams-O’Connor, & Beck, 2006). Swimmers averaged one more heavy drinking episode and two-three more days of drinking per week than other sport athletes (Martens, Watson, & Beck, 2006).

Swimmers and divers report taking advantage of any social opportunities to drink given their rigorous and time-consuming practice and meet schedules (Martens, Watson, & Beck, 2006). Often, the pattern of drinking when time permits is consistent through all athletic teams; athletes who are in competitive seasons have lower levels of alcohol consumption than those in season (Bower & Martin, 1999; NCAA, 2001; Thombs, 2000). It seems as though athletes take advantage of rare opportunities to drink, and when they do drink, they display significantly
riskier drinking habits (Nelson & Wechsler, 2001). When athletes drink, they usually binge-drink, view drinking to get drunk as an important reason for drinking, and are more likely to be drunk three or more times in the past month (Nelson & Wechsler, 2001). Thus, it is not surprising that athletes experience more alcohol-related harms than non-athletes. These include academic consequences, antisocial behavior, getting into trouble with police, being hurt or injured, regretting past actions, and sexually abusing someone else (Martens, Dams-O’Connor, 2006; Nelson & Wechsler, 2001). Overall, athletes experience five more alcohol-related consequences in each drinking instance than non-athletes (Nelson & Wechsler, 2001). The risk associated with collegiate athlete drinking habits is great.

**Disordered Eating and College Students**

College students as a population are not only vulnerable to high alcohol use, but are also uniquely susceptible to disordered eating. Eating disorders and disordered eating most commonly develop during the adolescent years (Budd, 2007). Extreme weight loss behaviors such as self-induced vomiting, diet pill use, and binge eating increase in the period of adolescent to early adulthood (Neumark-Sztainer, Wall, Larson, Eisenberg, & Loth, 2011). The competitive atmosphere of college puts increased stress on students, and may add social pressures for students to fit a certain body ideal (Hudson, Hiripi, Pope, & Kessler, 2007; Striegel-Moore, Silberstein, Frensch, & Rodin, 1988). High perceived stress, feelings of helplessness, and negative feelings about weight are all related to disordered eating in students, and likely contribute to the increase of dieting and purging behaviors that occur after students’ freshman year of college (Striegel-Moore et al., 1988). The first year of college seems to be critical in the development of maladaptive eating patterns, likely fostered by adolescent susceptibility, stress, and the transition to the college environment (Budd, 2007; Striegel-Moore et al., 1988).

Peers also play a role in the development of disordered eating. Females who want to possess control over their life and body and feel a connection with peers display more disordered eating symptoms (Budd, 2007). Females feel a desire to connect specifically to other students they believe are performing the same disordered eating behaviors. Furthermore, the idea of peer acceptance influences feelings to change appearance in both male and females (Eisenberg & Neumark-Sztainer, 2010), and peer groups as well as Greek life have been identified as potential causes of disordered eating (Giles, Champion, Sutfin, McCoy, & Wagoner, 2009). Although the direct cause of disordered eating in college is not known, these maladaptive eating patterns are
perpetuated by injunctive norms. College students who perceive higher rates of disordered eating behaviors among their peers are more likely to conform to those behaviors (Budd, 2007; Forney & Ward, 2013; Eisenberg & Neumark-Sztainer, 2010).

**Disordered Eating and Collegiate Athletes**

Although it is clear that college students are a population susceptible to developing disordered eating, it is unclear if collegiate athletes share this risk. The literature concerning this topic is mixed (Klasey, 2009). Athletes may have additional sources of pressure to maintain a certain body type, and be equally susceptible to disordered eating patterns and eating disorders (Ferrand, Magnan, Rouveix, & Filaire, 2007; Krentz, 2011; Petrie, 1996; Smolak, Murnen, & Ruble, 2000; Torres-McGehee, Monsma, Gay, Minton, & MadyFoster, 2011; Van Durme, 2012).

Athletes participating in aesthetic sports are often faced with higher demands for weight management. Aesthetic sports emphasize appearance and are associated with beauty and grace; these sports are also referred to as lean sports, or judged sports (Klasey, 2009; Schwarz et al., 2005). Sport-related requirements such as tight-fitting uniforms and judging criteria increase pressure on athletes to appear thin (Torres-McGehee et al., 2011).

The pressures lean-sport athletes face coincides with the concept of “performance thinness” (Ferrand et al., 2007; p. 228). Performance thinness is the notion that having a certain body shape will increase an athlete’s sport competence. Schwarz and colleagues (2005) found that athletes in judged sports dieted more often than refereed sport athletes and non-athletes. Certain uniforms serve to intensify this concept. Oftentimes aesthetic athletes diet specifically to look smaller in athletic uniform (Torres-McGehee et al., 2011).

Even athletes with already low body fat percentages express the desire to be thin. In a 2011 study of equestrian athletes, individuals who were already of low body weight desired to lose an average of 10-15 pounds (Torres-McGehee et al., 2011). Furthermore, most athletes, even those not at-risk for an eating disorder, showed a discrepancy between actual BMI and perceived BMI, perceiving their BMI to be higher than in actuality (Torres-McGehee et al., 2011). This finding was consistent with a study by Ferrand and colleagues (2007) in which 54.5% of synchronized swimmers viewed themselves as “overweight.”

Weight dissatisfaction is another factor associated with eating behaviors. Weight dissatisfaction is linked to self-oriented perfectionism (Ferrand et al., 2007; Schwarz et al.,
Both body-esteem weight satisfaction and self-oriented perfectionism is negatively correlated with dietary restriction, and self-oriented perfectionism is significantly positively correlated with dietary restriction (Ferrand et al., 2007). Dietary restriction is also linked to drive for thinness, features of bulimia, and having concerns about weight and body shape (Van Durme, 2012). Lean sport athletes show higher scores on perfectionistic tendencies and a drive for thinness, which may put them at-risk for the development of an eating disorder (Engel et al., 2003; Johnson et al., 1999).

Overall, there is a low level of agreement as to whether or not athletes display higher levels of disordered eating than non-athletes (Klasey, 2009). Several studies have found that athletes are at lower risk for disordered eating than non-athletes (Hausenblas & Downs, 2001; Reinking & Alexander, 2005). However, much of the literature ascertains that within the athletic community, lean sport athletes illustrate a greater risk for developing disordered eating practices than non-athletes (Alexander, 2005; Schwarz et al., 2005; Smolak et al., 2000). Despite this, several studies have found no differences between lean sport athletes and other sport athletes in disordered eating practices and risk (Kirk, Singh, & Getz, 2001; Zucker, Womble, Williamson, & Perrin, 2009). Additional studies have found differences in competitive levels (elite vs. non-elite; Smolak et al., 2000), while others have indicated no differences between high school, college, and elite athletes (Hausenblas & McNally, 2004; Hausenblas & Carron, 1999). Additional research is necessary to fully examine the relationship between athlete status and disordered eating in college students.

It is especially important to examine disordered eating in athletes given the detrimental consequences associated with the Female Athlete Triad. The Female Athlete Triad is a medical disorder that includes disordered eating, low bone density, and amenorrhea (Daniell & Dunlap, 2012). The updated version of this condition now includes a wider range of symptoms including energy accessibility, bone mineral density, and menstrual function (Javed, Tebben, Fischer, & Lteif, 2013). Thus, the Female Athlete Triad incorporates the imbalance between consumption and expenditure of energy; an athlete does not have to be clinically diagnosed with an eating disorder to fit this criteria. The definition also incorporates a wide range of menstrual fluctuations. Any menstrual dysfunction such as delayed onset of menstruation, oligomenorrhea (periods between menses for more than 35 days), and amenorrhea (complete absence of menstrual cycle) are included. Although overall prevalence of the Female Athlete Triad is low,
many athletes experience individual symptoms. About 23.5% of female athletes experience malfunctioned menstruation, 18.2% experience disordered eating, and 4.1% have a low bone mineral density (Javed et al., 2013). Symptoms of the Female Athlete Triad also vary by sport; athletes in aesthetic sports with high mechanical loading demands such as gymnastics are particularly susceptible to this condition (Javed et al., 2013). The risk is intensified in low-weight individuals, given that every 10% decrease in weight causes a 1-2% decrease in bone mineral density (Javed et al., 2013). Thus, low energy availability (consuming less energy than expended) and low body fat leads to menstrual dysfunction and detrimental decreases in bone density that are often irreversible.

Eating disorders are associated with other severe health risks, such as heart problems, tooth erosion, cardiovascular issues, and possible death (Damiel & Dunlap, 2012). Furthermore, eating disorders often cause extreme fatigue and a decrease in cognitive functioning that can lead to a lowered quality of school studies and academic learning (Scoffier, Woodman, & d’Arripé-Longueville, 2011). These consequences should be a great cause of concern given the importance of grades in college. College grades and knowledge often influence a student’s likelihood of earning a job as well as their job performance after college (Roth, BeVier, Switzer, Schippmann, 1996).

Disordered eating goes beyond physical effects, often leading to sociocultural consequences. Individuals with eating disorders have lower quality relationships with parents and peers, and are less likely to be accepted by their cohort (Scoffier et al., 2011). Lack of peer acceptance is especially problematic given the strong desire college students have to fit in with their friends. Also, considering that college is a time period critical for identity development as well as decision-making and problem-solving skills, lack of peer acceptance may pose a deficit in the development of these skills (Erikson, 1968). Eating disorders are dangerous not only because of the aforementioned consequences, but they are often associated with other maladaptive behavioral patterns with a unique and intensified set of consequences.

**Comorbidity**

Disordered eating/eating disorders and alcohol use/dependence are frequently associated with one another (Bulik et al., 2004; Corte & Stein, 2000; Goldbloom, 1993; Krahn, Kurth, Gomberg, & Drewnowski, 2005; Lundholm, 1989). Previous research indicates that alcohol dependence is seen in about 30-50% of those with bulimia and 12-15% of those with anorexia,
and about 35% of those who are alcohol dependent also have an eating disorder (Burke et al., 2010). Although causality is unidentified, both patterns seem to develop in the same type of individuals (Lundholm, 1989). In a clinical sample of 672 women, the majority (54%) had an eating disorder that lead to an alcohol use disorder, 32% had an alcohol use disorder that lead to an eating disorder, and 9% of participants experienced an eating disorder and alcohol use disorder at the same time (Bulik et al., 2004). Although causality cannot be inferred from these findings, they illustrate a correlation between eating disorders and alcohol use disorder.

Not only are eating disorders related to alcohol use disorder at the clinical level, but often these two behavioral patterns are related at the sub-clinical level. Dieting and bingeing behaviors are used more often by those who consume high levels of alcohol (Krahn et al., 2005). These two behaviors often share correlations with certain personality traits. Alcohol misuse and bulimia are correlated to ineffectiveness, maturity fears, and interpersonal distrust (Lundholm, 1989). Furthermore, alcohol use and bulimia are both associated with drive for thinness, perfectionism, and body dissatisfaction; these characteristics are often seen in individuals diagnosed with anorexia nervosa (Bulik et al., 2004). Thus, the full continuum of substance use and disordered eating behaviors should be examined in order to gain a full understanding of comorbidity (Corte & Stein, 2000).

Aside from the similarity in character traits of individuals with alcohol use disorder and disordered eating, there is still some speculation as to the causes of this comorbidity. Low self-worth leads to a hindered ability to self-soothe and self-regulate, possibly leading students to inappropriately cope through disordered eating and drinking habits (Goldbloom, 1993). Given the stressful and novel nature of the college environment, this hypothesis may be especially relevant to college students (Striegel-Moore et al., 1988).

**Drunkorexia**

The comorbidity of disordered eating and substance abuse/misuse paired with young adults’ susceptibility to both these activities is cause for concern. The aforementioned findings indicate that college students are a population specifically at risk for the combination of these two behavioral patterns. A relatively new trend that has emerged on college campuses has been termed *drunkorexia* (CBS, 2008). Drunkorexia is considered a subtype of the connection between alcohol consumption and disordered eating (Rahal et al., 2012). Although the exact definition of drunkorexia has not been streamlined in the literature, it is commonly known as
restriction or purging of calories on drinking days in order to neutralize the calories consumed through alcohol (Burke et al., 2010; Giles et al., 2009; Rahal et al., 2012).

Drunkorexia not only includes the relationship between caloric restriction, purging, and alcohol use, but other factors as well. Exercise is identified as an additional compensation technique in order to purge the body of calories (Barry & Piazza-Gardner, 2012). Purging may also take the form of drinking large amounts of alcohol in order to become sick (Barry & Piazza-Gardner, 2012; Giles et al., 2009). Peralta (2002) further expands the definition to include meal alteration, which includes skipping meals or limiting fat or calories of meals. Thus, drunkorexia is an extremely complex phenomenon that ultimately involves compensatory practices in order to minimize the caloric effects of alcohol consumption.

The prevalence of drunkorexia is becoming widespread across college campuses. A 2009 study of 4,271 undergraduates designated that 39% of participants reported restricting calories on days they planned to consume alcohol later that evening (Giles et al., 2009). Students who controlled calories were also significantly younger (40% of freshmen and sophomores), predominately white (only 23% of African Americans restricted) and Greek pledges (50%). Even though women (45%) controlled calories significantly more than men, 29% of men still participated in calorie control behaviors on drinking days. Oppositely, a 2013 sample of college students indicated that men participate in drunkorexia more often than females (Dierks & Ward, 2013), whereas other studies suggest no gender differences on Drunkorexia behaviors (Rahal et al., 2012). Thus, the relationship between calorie restriction and gender remains unclear in the literature.

There are a range of motives for why college students choose to partake in drunkorexia. Out of the aforementioned 2009 sample, 47% of women and 32% of men restricted for weight control, and only 11% of males and 5% of females restricted to become drunk faster (Giles et al., 2009). Participants often will not drink socially specifically due to fear of weight gain through empty calories (Peralta, 2002). However, quick and intensified intoxication is a secondary benefit of restriction of calories in some individuals (Peralta, 2002).

Peer behavior is an additional influence of practicing drunkorexia. Students who participate in drunkorexia also report a high frequency of friends who either restrict calories, purge, or alter drinking for the purpose of weight control (Peralta, 2002). In this way, the motives for alcohol consumption and disordered eating that are influenced by injunctive norms parallel
motes for drunkorexia (Budd, 2007; Eisenberg & Neumark-Sztainer, 2010; Osberg et al., 2011). Other reasons for calorie restriction include saving money, sickness prevention, not being hungry, forgetting to eat, and increased ability to drink (Burke et al., 2010; Giles et al., 2009).

Although the aforementioned studies give a superficial indication of prevalence and motives of drunkorexia, researchers did not use validated scales to collect data on this behavior pattern. Rahal, Bryant, Darkes, Menzel, and Thompson created the Compensatory Eating and Behaviors in Response to Alcohol Scale (CEBRACS) in 2012 to establish a valid measure that fully examines the drunkorexia phenomenon. The CEBRACS is unique in that it measures compensatory behaviors over three time periods of drinking: before drinking, during drinking, and after drinking. Before drinking participants have not yet consumed alcohol, during drinking participants are still feeling the effects of alcohol, and after drinking participants are no longer feeling the effects of alcohol. The compensatory behaviors assessed are dieting, skipping meals, exercising, vomiting, and use of diuretics/laxatives or diet pills in each of these three time periods of drinking. The CEBRACS follows a four factor model, illustrating Alcohol Effects, Bulimia, Dietary Restriction and Exercise, and Extreme Restriction.

The CEBRACS is effective in that it gives a full and comprehensive view of the drunkorexia phenomenon. CEBRACS score was significantly correlated to drive for thinness, bulimia symptoms, and high levels of body dissatisfaction in a sample of 274 undergraduate students (Rahal et al., 2012). The Alcohol Effects factor correlates with drive for thinness and bulimia; the Bulimia factor is significantly associated with drive for thinness and bulimia; the Dietary Restraint and Exercise factor is significantly related to drive for thinness, bulimia symptoms, and high levels of body dissatisfaction. Compensatory behaviors are associated with higher levels of average alcohol consumption, maximum drinks, and binge drinking. In addition, the CEBRACS demonstrates good internal validity (0.79 to 0.95) for all subscales and depicts compensatory behaviors used across an entire drinking episode (Rahal et al., 2012).

Compensation for calories consumed through alcohol has serious consequences. Calorie restriction increases men’s chances in becoming intoxicated by 99%, and women’s chances by 137% (Giles et al., 2009). Drunkorexia leads to getting into physical fights in males and being sexually abused, losing memory, getting injured, and having unprotected sex in females; participants who restricted experienced more alcohol-related consequences even though they consumed less alcohol (Giles et al., 2009). Calorie restriction may intensify consequences in
females since a lower weight and lower number of alcohol metabolizing enzymes lead to quicker intoxication (Burke et al., 2010).

Alcohol has toxic effects on the body that often manifest in hypoglycemia. Alcohol is also known to leach nutrients and vitamins from the body and reduces the body’s ability to regulate the blood sugar (Burke et al., 2010). Drinking alcohol without eating leads to a higher chance of losing memory and blacking out, and replacing meals with alcohol may cause malnourishment (Burke et al., 2010). Given these consequences, restricting calories prior to drinking alcohol should be considered a serious health issue across college campuses (Giles et al., 2009).

**Drunkorexia and Collegiate Athletes**

Drunkorexia may be an even more pressing issue among collegiate athletes. Previous literature indicates that athletes often have higher rates of binge-drinking and practice more risky drinking behaviors than non-athletes (Martens et al., 2006; Nelson & Wechsler, 2001). Additionally, athletes may be at greater risk for disordered eating than non-athletes (Smolak et al., 2000). Furthermore, the concept of performance thinness may give lean sport athletes greater incentives to restrict calories (Ferrand et al., 2007). Due to the high rates of comorbidity between alcohol use and disordered eating, it is logical that athletes may be susceptible to the combination of these two maladaptive behavioral patterns, manifested in drunkorexia.

Athletes may also illustrate higher levels of drunkorexia given the relationship between drunkorexia and physical activity. A recent study used physical activity levels to directly predict binge drinking in college students; the more physical activity the students reported, the more likely they were to participate in drunkorexia (Barry & Piazza-Gardner, 2012). Furthermore, there was a significant positive relationship between disordered eating, binge drinking, and physical activity. Using this predictive model, collegiate athletes may be more susceptible to higher levels of alcohol consumption and compensatory behaviors used as a weight control modality. Drunkorexia may be especially prevalent in athletes given the sociocultural pressures this group faces to stay thin within the culture of alcohol use that occurs in college (Osberg et al., 2011; Peralta, 2002).

Although drunkorexia in collegiate athletes is plausible, there is a large gap in the literature concerning this topic. There is literature indicating that college athletes consume more alcohol, are more likely to binge drink, and display more dangerous drinking behaviors (Martens
et al., 2006; Nelson & Wechsler, 2001). Literature also illustrates that athletes are very susceptible to perfectionism and striving towards performance thinness (Ferrand et al., 2007; Krentz, 2011; Smolak et al., 2000; Schwarz et al., 2005; Torres-McGehee et al., 2011; Van Durme, 2012). However, there seems to be no published literature that examines the comorbidity between these two behaviors in athletes, despite the high rates of comorbidity so frequently found in clinical and non-clinical samples (Bulik et al., 2004; Corte & Stein, 2000; Goldbloom, 1993; Lundholm, 1989). Among the Drunkorexia literature, one 2009 article controlled for athlete status but did not examine athletic differences (Giles et al., 2009). This study used data collected before a validated measure of drunkorexia was available, and simply asked whether or not participants restricted calories. The current study will extend the literature by using the CEBRACS to examine drunkorexia in athletes and non-athletes.

**Purpose**

The drinking atmosphere in college encourages alcohol consumption, which makes weight management difficult. The combination of the drinking atmosphere and pressures of weight control may give collegiate athletes a high susceptibility to drunkorexia. For this reason, the purpose of the present study is to examine drinking and compensatory behaviors in athletes as compared to their non-athlete peers. It is hypothesized that athletes and non-athletes will differ concerning alcohol consumption, alcohol-related consequences, and eating behaviors. It is also hypothesized that athletes and non-athletes will differ across the scales of the CEBRACS.

**Methods**

**Participants**

Participants were 295 college students from a mid-sized Midwestern university. Ages ranged from 17 to 25 years of age ($M_{age} = 20.10$, $SD = 1.22$) and encompassed all levels of academic year (Freshman, $n = 38$, 12.9%; Sophomore, $n = 65$, 22.0%, Junior, $n = 84$, 28.5%, Senior, $n = 96$, 32.5%, Super Senior/5th year, $n = 10$, 3.4%, and Graduate Student $n = 2$, .7%). The sample was predominately female ($n = 213$, 72.2%), not married ($n = 286$, 96.9%), and Caucasian ($n = 271$, 91.9%). About one third of the sample was a member of a sorority or fraternity ($n = 92$, 31.2%), and less than half a varsity athlete ($n = 137$, 46.4%). Students had an average GPA of 3.35 ($SD = .46$). The majority of the sample was somewhat happy with their weight ($n = 89$, 30.2%) and only 4 participants (1.4%) were currently receiving treatment for an eating disorder at the time of survey. Due to heavy athlete recruitment and a high female
response rate, the sample of the present study was not demographically representative of the university.

Procedure

Participants were recruited in two different ways. In order to recruit athletes, the primary investigator spoke with the coaches of sport teams. Each coach was asked permission for the athletes on their team to complete a brief, 10-15 minute online survey, either at study tables or during personal time. Each coach was given an email invitation with the survey link to send to their team; athletes were made aware that their answers would not be linked to responses and participation was completely voluntary. For participation, athletes would be entered into a random drawing to win one of six $50 gift cards to various establishments in the area. All procedures were approved by the university’s NCAA representative and met compliance for NCAA standards.

College non-athletes were recruited for the online study using a snowball method. The same email invitation with survey link was sent to professors who consented to help with participation. The professors then sent potential participants the email invitation containing the link for the online survey; non-athletes were also made aware that their answers would not be linked to responses and participation was completely voluntary. Non-athletes were entered into the same drawing to win one of six $50 gift cards to local establishments upon survey completion. See Appendix A for consent form. All procedures were pre-approved by the university’s Institutional Review Board.

Measures

Demographics. Participants completed a demographic information sheet asking age, year in school, family income, ethnicity, athlete/non-athlete status, and other additional questions. See Appendix B for a complete list of demographic questions.

Alcohol Use. Participants were asked about their drinking habits in order to measure alcohol use. Participants were provided with the definition of a standard drink: a 12-ounce beer, a one-ounce shot of liquor, and a four-ounce glass of wine. Participants were asked their drinking history, consisting of two items: if they have ever consumed one drink of alcohol, and how old they were when they consumed their first drink of alcohol. Participants were then asked alcohol frequency questions: how many alcoholic drinks they consume in one typical drinking episode, how many alcoholic drinks they typically consume in one week, and the most drinks they have
ever consumed (peak drinking). Other items included: typical drinks for each day Monday through Sunday, and the number of binge drinking episodes in the past month (four drinks consumed by females and five drinks consumed by males). Drinking questions also included history of blackouts, where blacking out is defined as a portion of time when you have an inability to recall the past due to an intake of alcohol. See Appendix C for a complete list of Alcohol Use items.

**Problem Drinking.** Each participant was assessed for alcohol-related consequences. Participants completed the Rutgers Alcohol Problem Index (RAPI). The RAPI is a 23-item measure with a reliability of .92 and a 3 year stability coefficient of .40 (White & Labouvie, 1989). Participants rated on a scale from 0-4 (0 = “Never,” 1 = “1-2 times,” 2 = “3-5 times,” 3 = “6-10 times,” and 4 = “More than 10 times”) how many times in the past 3 years they have experienced each consequence as a result of alcohol consumption. The coded numbers (0 – 4) are then added together to get a score ranging from 0 to 69. In the nonclinical sample, mean scores ranged from 4 to 8, and in a clinical sample scores ranged from 21 to 25. These scores can be normed in any sample, and can accurately differentiate between drinking and problem drinking. The current sample averaged a score of 7.47 (SD = 9.96) with an internal consistency of .93. The RAPI is listed in Appendix D.

**Drunkorexia.** Participants’ involvement with drunkorexia behaviors was measured using the Compensatory Eating and Behaviors in Response to Alcohol Consumption Scale (CEBRACS), created by Rahal, Bryant, Darkes, Menzel, and Thompson (2012). The CEBRACS follows a four factor model: Alcohol Effects (7 items), Bulimia (6 items), Diet and Exercise (6 items), and Extreme Restriction (2 items). The CEBRACS evaluates behaviors before drinking, during drinking (while intoxicated), and after drinking (no longer intoxicated) used to counteract the calories in alcohol. The CEBRACS consists of 36 items valued on a 5 point Likert scale (1 = “Not at all,” 2 = “Seldom,” 3 = “Sometimes,” 4 = “Frequently,” and 5 = “Almost always”). These items assess eating less food than normal, eating less calories or fats, skipping meals, exercising, self-induced vomiting, and using diet pills, laxatives, or diuretics in relation to drinking. Internal validity for all factors range from .79 to .95. The means, standard deviations, and alpha values in males and females of the original study are displayed in Table 1. The CEBRACS questionnaire is listed in Appendix E.
**Eating Attitudes.** Eating disorder risk was assessed using the Eating Attitudes Test (EAT-26, Garner & Garfinkel, 1979). The EAT-26 contains 26 items rated on a 6-point Likert scale (3 = “Always,” 2 = “Usually,” 1 = “Often,” 0 = “Sometimes,” 0 = “Rarely,” and 0 = “Never”), with question number 26 reverse-scored. The EAT-26 demonstrates good internal consistency (Cronbach’s α = .93), and accurately measures symptoms and concerns characteristic of eating disorders on three subscales: Dieting, Bulimia and Food Preoccupation, and Oral Control. The dieting subscale consists of 13 items (M = 5.59, SD = 5.90, Cronbach’s α = .89), the bulimia subscale contains 6 items (M = 1.23, SD = 2.54, Cronbach’s α = .87), and the oral control subscale has 7 items (M = 1.50, SD = 2.43, Cronbach’s α = .79). Items are summed in order to produce a score for the corresponding subscale, and EAT total score is calculated by summing each subscale score. The EAT-26 is listed in Appendix F.

**Results**

**Alcohol Characteristics**

On average, participants were 16.49 (SD = 1.73) years of age when they consumed their first drink of alcohol. Students averaged 3.88 (SD = 2.72) standard drinks on a typical day of drinking, 1.81 (SD = 1.54) standard days of drinking in a typical week, and a peak drinking episode of 5.91 (SD = 4.37) standard drinks in the past 30 days. Participants tended to average 2.48 (SD = 1.32) binge drinking episodes in the past month. The majority of students have blacked out in their lifetime (n = 154, 52.2%) and have participated in extreme drinking (n = 178, 60.3%) at least once in their lifetime. Almost half of the sample had drank until they became drunk or intoxicated in the last month and have no intentions of stopping (n = 136, 46.1%).

**Athlete and Non-athlete Differences**

There were several unexpected patterns in the data that emerged through analysis. Despite the findings of previous literature (e.g. NCAA, 2001; Thombs, 2000), out of season athletes did not differ from in season athletes concerning alcohol consumption, blackouts, alcohol consequences, drunkorexia, or disordered eating behaviors. Results of independent t-tests for athletes in season and out of season are presented in Table 2.

Through data analysis, it became clear that the homogeneity assumption of the sample was violated; thus, a series of modified independent t-tests were used. Athletes differed from non-athletes on all characteristics of drinking. Athletes tended to drink less days in a typical
week, $t(289.27) = -10.19, p < .001$, less drinks in a typical day, $t(259.66) = -2.84, p = .01$, and less drinks in a peak drinking occasion, $t(258.30) = -4.13, p < .001$. Whereas on average non-athletes would have 4.30 standard drinks in a typical day, 6.90 standard drinks on a peak drinking occasion, and drink at least one alcoholic beverage 2.54 days each week, athletes would drink an average of 3.39 standard drinks in a typical day, 4.80 standard drinks on a peak drinking occasion, and drink an alcoholic beverage .98 days per week. All means, standard deviations, Cronbach’s alpha values, and independent t-test results for athlete and non-athlete drinking behaviors are presented in Table 3.

Although athletes and non-athletes had different alcohol consumption patterns, there were no differences in alcohol consequences (illustrated through RAPI scores) between athletes and non-athletes, $t(244) = -1.38, p = .17$. However, athletes and non-athletes did differ significantly concerning disordered eating behaviors illustrated through EAT-26 scores. Non-athletes demonstrated significantly higher EAT total score, $t(262) = 2.75, p = .03$, EAT bulimia score, $t(265) = 2.26, p = .03$, and EAT diet score, $t(257) = 2.19, p = .01$. Independent t-test results, means, standard deviations, and internal validity values are presented in Table 3. Non-athletes also illustrated significantly higher scores than athletes concerning drunkorexia (CEBRACS) subscales of alcohol, $t(256.18) = -2.34, p = .03$, diet and exercise, $t(247.94) = -3.38, p < .001$, and total scores, $t(253) = -2.73, p = .01$. All differences in CEBRACS scores between athletes and non-athletes are presented in Table 3.

**Blackouts and Extreme Drinking**

A chi-square analysis was used to examine the differences in blacking out, extreme drinking, and blacking out as a result of extreme drinking between athletes and non-athletes. The analysis revealed that athletes were significantly less likely to have blacked out in their lifetime $X^2 (1, N = 287) = 16.18, p < .001$, to have participated in extreme drinking within their lifetime $X^2 (1, N = 287) = 17.62, p < .001$, and to have blacked out as a result of extreme drinking $X^2 (1, N = 287) = 12.35, p < .001$.

**Sport differences**

Further analysis was used to explore differences between lean and non-lean sports. Sports were divided into lean sports (judging criteria and tight-fitting uniforms, e.g. synchronized skating), non-judged sports (sports with tight-fitting uniforms but no subjective judging criteria, e.g. cross country/track), and refereed sports (no tight-fitting uniforms or judging criteria, e.g. 
football). A one-way ANOVA revealed no differences across groupings of sport in CEBRACS total score, $F(2, 103) = 1.28$, $p = .28$. However, an additional ANOVA revealed that lean sport athletes illustrated significantly higher CEBRACS diet/exercise subscale scores than both non-judged and refereed sport athletes $F(2, 103) = 4.85$, $p = .01$. A Tukey’s post hoc test indicated that lean sport athletes significantly differed from both non-judged ($p = .045$) and refereed athletes ($p = .01$) Additional t-test results indicated that synchronized skaters had significantly higher scores on the EAT diet subscale $t(114) = 2.26$, $p = .03$, and EAT total score, $t(112) = 1.97$, $p = .05$.

**Greek Organization Members**

Although examining Greek (sorority/fraternity) affiliation was not originally proposed, a high number of non-athlete participants ($n = 156$) reported themselves as sorority/fraternity members ($n = 92$, 59%). Throughout data analysis, it seemed Greek organization members had unique behavioral patterns concerning alcohol consumption and eating patterns.

There was a significant difference in CEBRACS total scores between Greeks, varsity athletes, and non-Greek non-athletes displayed through a one-way ANOVA $F(2, 181) = .42$, $p < .001$. A Tukey’s post hoc test showed that Greeks and varsity athletes differed significantly at $p < .001$; the non-athlete non-Greek group was not significantly different from the other two groups. Greeks also displayed significantly higher EAT total scores $F(2, 19) = 7.51$, $p < .001$; a Tukey’s post hoc test showed that Greeks significantly differed from both varsity athletes ($p < .001$) and non-athlete non-Greeks ($p = .004$) concerning eating behaviors. When Greek-affiliated students are filtered out of analysis, there are no differences between athletes and non-athletes concerning CEBRACS, EAT, or RAPI. Independent t-test results and effect sizes are presented in Table 4.

**Discussion**

The prominence of alcohol use in athletes is extremely prevalent in the literature (Martens et al., 2006; Nelson & Weschler, 2001). However, athletes in the current sample tended to drink less often, less days of the week, and less drinks in a peak drinking occasion than non-athletes. These two groups did not differ concerning RAPI scores. Results suggest athletes still experience alcohol-related consequences at similar intensities and frequencies as those who consume more alcohol. Given this finding, athletes should still be considered a target population for reducing negative alcohol-related consequences.
The current sample did not replicate literature indicating athletes use binge and risky drinking behaviors more frequently and at a higher intensity than their non-athlete peers (e.g. White & Hingson, 2014). However, the sample of the present study did not represent the typical demographics of the university; the sample was predominately female and heavily recruited athlete participants. The non-athlete sample included a majority of fraternity/sorority members ($n = 92, 59\%$), which may include a higher concentration of Greek-affiliated students than other universities.

Previous research suggests Greek-affiliated students have unique pressures both to use alcohol (Barry, 2007; Ham & Hope, 2003) and to maintain a certain body ideal (Allison & Park, 2004; Giles et al., 2009). In the present study, Greek members were significantly more likely to embrace the drunkorexia phenomenon, and should be considered a possible at-risk population. Future research should explore the unique environments of Greek life that may promote the use of drunkorexia. Given peer roles are central to the development of risky drinking patterns (e.g. Gardner & Steinberg, 2005), it is possible Greek peers are a factor in the development of drunkorexia. Further research is necessary.

The present study was also unique in that the athlete sample included varsity synchronized skating athletes. Very few universities house these teams, which makes this particular sport rare in other athlete samples. The synchronized skaters of the sample appeared to have unique behavioral patterns apart from other sport athletes; synchronized skaters had significantly higher EAT diet and EAT total scores. The synchronized skaters also comprised the majority of the lean sport group; lean sport athletes illustrated significantly higher levels of EAT diet, EAT total, and CEBrACS diet/exercise subscales from both non-judged and refereed sport athletes. However, there were no differences in CEBrACS total scores across sport type.

A large number of previous studies have designated lean sport athletes as more susceptible to disordered eating practices (e.g. Alexander, 2005; Ferrand et al., 2007; Schwarz et al., 2005; Smolak et al., 2000; Torres-McGehee, 2011; Van Durme, 2012). The results of the present investigation appear to support previous findings. It is possible the lean sport athletes represented may be susceptible to carrying disordered eating practices over into alcohol consumption episodes, focusing on the diet and exercise aspects of drunkorexia. It is important to note the lean sport sample comprised a majority of synchronized skaters. It is possible these findings reflect a culture of one particular team instead of aesthetic athletes as a whole. Future
studies should examine how drunkorexia differs across sports, making sure to include a wide range of lean and non-lean sports.

Other limitations of the present study included the athlete recruitment process. Non-athlete students were recruited through academic courses, while athletes were mostly recruited through coaches; coaches were asked to disseminate survey invitations to athletes. Although statements of confidentiality were included in the recruitment email and at the start of the survey, one of the coaches conveyed to the primary investigator that athletes had some reservations about confidentiality. The survey included questions about potentially incriminating behaviors if coaches were to become aware of responses. If participants felt a threat to confidentiality, it is possible honesty could have been compromised. It may be beneficial in the future to limit coach contact and emphasize confidentiality of answers when recruiting athletes.

The term drunkorexia was recently coined in 2008 by CBS News, and is growing as a research topic given its relative pervasiveness. Non-athletes and Greek-affiliated students had the highest levels of drunkorexia participation. Although athletes exhibited lower levels of drunkorexia than non-athletes, EAT scores were significantly higher in synchronized skaters, and CEBRACS diet/exercise subscales were significantly higher in lean sport athletes. Although the athlete population as a whole may not be at-risk for embracing drunkorexia, certain aesthetic athletes may be more susceptible, especially if these athletes are already embracing disordered eating practices. Data does suggest drunkorexia is a more complex phenomenon than simply the comorbidity between alcohol use and disordered eating. In order to understand more about the development of drunkorexia, further studies might examine motivations to participate, how motives vary across groups, and how these motivations affect consequences associated with drunkorexia. Although this specific study did not examine drunkorexia consequences, previous literature (e.g. Burke et al., 2010; Giles et al., 2009) suggests that drunkorexia has a specific set of negative outcomes apart from alcohol-related consequences. Understanding these consequences further would be especially important in athletes, given the detriments of the Female Athlete Triad (Damiel & Dunlap, 2012). In order to limit consequences resulting from drunkorexia, education of college students and mental health professionals is necessary for prevention and treatment.
References


Table 1.
Original CEBRACS Mean, Standard Deviations, and Subscale Totals

<table>
<thead>
<tr>
<th>Item</th>
<th>Males</th>
<th>Females</th>
<th>t*</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Effects</td>
<td>9.75 (5.71)</td>
<td>10.53 (5.41)</td>
<td>3.05</td>
<td>.95</td>
</tr>
<tr>
<td>Bulimia</td>
<td>6.06 (.24)</td>
<td>6.47 (1.85)</td>
<td>.76</td>
<td>.92</td>
</tr>
<tr>
<td>Diet and Exercise</td>
<td>9.33 (3.92)</td>
<td>10.43 (5.15)</td>
<td>2.90</td>
<td>.87</td>
</tr>
<tr>
<td>Extreme Restriction</td>
<td>2.20 (.78)</td>
<td>2.31 (1.01)</td>
<td>2.03</td>
<td>.79</td>
</tr>
<tr>
<td>Total CEBRACS Score</td>
<td>27.33 (8.28)</td>
<td>29.75 (9.69)</td>
<td>3.65</td>
<td>.89</td>
</tr>
</tbody>
</table>

*Note. Scale means are presented with standard deviations in parenthesis; a series of independent t-tests using a Bonferri correction showed no significant differences between genders for all subscales. *df = 272 for all t-tests.*
Table 2.
Eating and Drinking Behaviors of Athletes by Competitive Season

<table>
<thead>
<tr>
<th>Item</th>
<th>In season</th>
<th>Out of season</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinks - Week</td>
<td>.89 (1.01)</td>
<td>1.06 (1.33)</td>
<td>t(132) = -.81, p = .42</td>
</tr>
<tr>
<td>Drinks - Day</td>
<td>3.55 (3.18)</td>
<td>3.25 (2.77)</td>
<td>t(130) = .57, p = .57</td>
</tr>
<tr>
<td>Drinks - Peak</td>
<td>4.73 (5.15)</td>
<td>4.87 (4.31)</td>
<td>t(131) = -.17, p = .86</td>
</tr>
<tr>
<td>RAPI</td>
<td>6.58 (10.67)</td>
<td>5.24 (8.22)</td>
<td>t(101) = .71, p = .48</td>
</tr>
<tr>
<td>EAT Diet</td>
<td>4.55 (6.23)</td>
<td>4.51 (5.92)</td>
<td>t(116) = .03, p = .98</td>
</tr>
<tr>
<td>EAT Bulimia</td>
<td>.97 (2.59)</td>
<td>.83 (1.79)</td>
<td>t(117) = .33, p = .75</td>
</tr>
<tr>
<td>EAT Oral Control</td>
<td>1.38 (1.76)</td>
<td>1.39 (1.79)</td>
<td>t(117) = -.02, p = .98</td>
</tr>
<tr>
<td>EAT Total</td>
<td>7.02 (8.84)</td>
<td>6.83 (7.51)</td>
<td>t(114) = .12, p = .90</td>
</tr>
<tr>
<td>CEBRACS-Alcohol</td>
<td>8.44 (3.43)</td>
<td>8.64 (3.58)</td>
<td>t(107) = -.32, p = .75</td>
</tr>
<tr>
<td>CEBRACS-Bulimia</td>
<td>6.29 (1.70)</td>
<td>6.72 (2.45)</td>
<td>t(106) = -1.05, p = .30</td>
</tr>
<tr>
<td>CEBRACS-Diet/Exercise</td>
<td>9.56 (4.92)</td>
<td>9.81 (5.52)</td>
<td>t(105) = -.25, p = .80</td>
</tr>
<tr>
<td>CEBRACS-Restiction</td>
<td>2.40 (1.06)</td>
<td>2.36 (.96)</td>
<td>t(106) = .21, p = .83</td>
</tr>
<tr>
<td>Total CEBRACS</td>
<td>26.72 (8.47)</td>
<td>27.56 (10.21)</td>
<td>t(105) = -.47, p = .64</td>
</tr>
</tbody>
</table>

*Note.* Scale means are presented with standard deviations in parentheses.
Table 3.
Drinking and Eating Behaviors by Athlete Status

<table>
<thead>
<tr>
<th>Item/ Scale</th>
<th>Athletes</th>
<th>Non-athletes</th>
<th>t</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinks- Week</td>
<td>.98(1.18)</td>
<td>2.54(1.45)</td>
<td>(t(289.27) = -10.19, p &lt; .001)</td>
<td>-</td>
</tr>
<tr>
<td>Drinks - Day</td>
<td>3.39(2.94)</td>
<td>4.30 (2.46)</td>
<td>(t(259.66) = -2.84, p = .01)</td>
<td>-</td>
</tr>
<tr>
<td>Drinks - Peak</td>
<td>4.81(4.69)</td>
<td>6.90 (3.82)</td>
<td>(t(258.30) = -4.13, p &lt; .001)</td>
<td>-</td>
</tr>
<tr>
<td>Binge Drinking</td>
<td>2.04 (1.25)</td>
<td>2.88 (1.26)</td>
<td>(t(285) = -5.64, p &lt; .001)</td>
<td>-</td>
</tr>
<tr>
<td>RAPI</td>
<td>6.49 (11.04)</td>
<td>8.26 (9.05)</td>
<td>(t(244) = -1.38, p = .17)</td>
<td>.93</td>
</tr>
<tr>
<td>EAT Diet</td>
<td>4.69(6.35)</td>
<td>6.10 (7.14)</td>
<td>(t(257) = 2.19, p = .01)</td>
<td>.88</td>
</tr>
<tr>
<td>EAT Bulimia</td>
<td>1.00 (2.54)</td>
<td>1.46 (2.97)</td>
<td>(t(265) = 2.26, p = .03)</td>
<td>.85</td>
</tr>
<tr>
<td>EAT Oral Control</td>
<td>1.52 (2.37)</td>
<td>1.25 (2.40)</td>
<td>(t(265) = -1.35, p = .49)</td>
<td>.75</td>
</tr>
<tr>
<td>EAT Total</td>
<td>7.33 (9.52)</td>
<td>8.82 (10.88)</td>
<td>(t(262) = 2.75, p = .03)</td>
<td>.92</td>
</tr>
<tr>
<td>CEBRACS-Alcohol</td>
<td>8.67 (3.61)</td>
<td>9.93 (5.11)</td>
<td>(t(256.18) = -2.34, p = .03)</td>
<td>.95</td>
</tr>
<tr>
<td>CEBRACS-Bulimia</td>
<td>6.60 (2.39)</td>
<td>6.83 (2.64)</td>
<td>(t(258) = -7.19, p = .47)</td>
<td>.93</td>
</tr>
<tr>
<td>CEBRACS- Diet/Exercise</td>
<td>9.75 (5.21)</td>
<td>12.09 (5.87)</td>
<td>(t(247.94) = -3.38, p &lt;.001)</td>
<td>.88</td>
</tr>
<tr>
<td>CEBRACS- Restriction</td>
<td>2.45 (1.16)</td>
<td>2.65 (1.35)</td>
<td>(t(256) = -1.22, p = .22)</td>
<td>.64</td>
</tr>
<tr>
<td>Total CEBRACS</td>
<td>27.56(9.93)</td>
<td>31.47 (12.25)</td>
<td>(t(253) = -2.73, p = .01)</td>
<td>.93</td>
</tr>
</tbody>
</table>

*Note.* Scale means are presented with standard deviations in parentheses.
Table 4.

Non-Athlete Non-Greeks VS. NCAA Athletes

<table>
<thead>
<tr>
<th>Item</th>
<th>Athletes</th>
<th>Non-athletes</th>
<th>t</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAPI</td>
<td>6.55 (11.22)</td>
<td>6.58 (8.91)</td>
<td>$t(168) = -.02, p = .99$</td>
<td>-0.00</td>
</tr>
<tr>
<td>EAT Total</td>
<td>7.14 (9.20)</td>
<td>8.09 (11.52)</td>
<td>$t(181) = -.61, p = .54$</td>
<td>-0.05</td>
</tr>
<tr>
<td>Total CEBRACS</td>
<td>27.65 (10.12)</td>
<td>28.56 (9.92)</td>
<td>$t(173) = -.59, p = .56$</td>
<td>-0.05</td>
</tr>
</tbody>
</table>

Note. Scale means are presented with standard deviations in parentheses.
Dear Participant,

You have been asked to participate in the current research study. The research project is described in the following form. If you have any questions about the study, please call the primary investigators, Marina Galante and Dr. Rose Marie Ward.

Description of the research: The purpose of the present study is to collect information concerning alcohol use, eating behaviors/disorders, and compensatory eating behaviors in response to alcohol consumption. As with online surveys, all internet-based information is subject to a small chance of outside tampering. However, researchers will make every effort to keep confidentiality of responses by not investigating IP addresses and removing data from the server after completion.

1. **You must be 18 years of old to participate in this research study.**
2. **Research procedures:** If you decide to participate in this study, you will be filling out a survey that assesses alcohol use, eating behaviors/disorders, and compensatory eating behaviors in response to alcohol consumption. Some questions will ask about your behaviors concerning alcohol use history, current alcohol use, eating habits, and compensatory behaviors in response to alcohol consumption.
3. **Time required for participation:** The survey will take approximately 20-30 minutes to complete.
4. **Potential risks:** The possible risks or discomforts of the study are minimal. As a participant, you may feel embarrassed or uncomfortable answering questions that have private or personal significance. Some of the questions may ask you to admit potentially incriminating information or illegal behavior. It is unlikely that your responses will be linked to you, but someone may try to identify you based on demographic information. However, data confidentiality is the primary concern of this research project and researchers will take necessary precautions to ensure that your identity is protected.
5. **Potential benefits:** Your participation in this study may help you learn about your own health behaviors and may increase awareness of some behavioral issues that may occur in college. Your answers will help researchers better understand college student health behaviors.
6. **Confidentiality:** Your participation in the study is anonymous. All answers to questions are private, and will not be shared with any other individuals. Scientific reports will be based on group themes and will not identify any individuals.
7. **Voluntary participation:** Your participation in this study is completely voluntary, and you may refuse to answer any question if you wish to do so.
8. **Compensation for injury:** Researchers do not expect that your participation in this study will be harmful or injurious to you. However, if this study causes you any harm, please contact the primary investigators.
9. **Contact information:** If you have any questions about the study, you may contact the primary investigators, Marina Galante through email GalantME@miamioh.edu and phone (919) 757-4182 and Dr. Rose Marie Ward through email wardm1@miamioh.edu.
If you have any questions or concerns about your rights as a subject, you may contact Miami University’s Office for the Advancement of Research and Scholarship, at (513) 529-3600 or humansubjects@miamioh.edu.

By filling out this survey, you acknowledge that you are at least 18 years old. You have read the consent form and all questions have been answered to your satisfaction. Completing this survey implies your consent to participate in this study.

If any of these questions are upsetting to you and you would like to talk to someone, please use the numbers listed below.

Miami University Student Counseling Service (513) 529-4634
Psychological Clinic, located in the Psychology Building (513) 529-2423
Community Counseling and Crisis Center (513) 523-4146

Thank you,
Marina Galante
Rose Marie Ward, Ph.D.
Primary Investigators
Appendix B

Demographic Questionnaire

1. What year are you in school?
   a. Freshman
   b. Sophomore
   c. Junior
   d. Senior
   e. Fifth year
   f. Graduate Student

2. What is your academic major?

3. What is your age (in years)?

4. What is your gender?
   a. Male
   b. Female
   c. Transgender male
   d. Transgender male
   e. Gender queer/non-conforming
   f. Other

5. What is your marital status? (mark one)
   a. Married
   b. Not married, but living with partner
   c. Not married
   d. Separated
   e. Divorced
   f. Widowed
   g. Don’t know

6. What is your race?
   a. American Indian or Alaskan Native
   b. Asian or Asian American
   c. Black, African American, or Haitian
   d. Native Hawaiian or other Pacific Islander
   e. White (Caucasian)
   f. Other (please specify)

7. What is your ethnicity?
   a. Hispanic or Latino/Latina
   b. Not Hispanic or Latino/Latina

8. Have you ever had sexual intercourse (vaginal or anal)?
   a. Yes
   b. No

9. Are you currently in a committed romantic/dating relationship or marriage?
   a. Yes
   b. No

10. Do you intend on pledging a sorority or a fraternity or are a current member or a sorority or fraternity?
    a. Yes, I am a member
    b. Yes, I intend to pledge
    c. No I am not a member and I do not intend to pledge

11. Do you participate in intercollegiate, NCAA varsity sports?
    a. Yes
    b. No
    11A. If yes, what sport do you participate in?
    a. Yes
    b. No
    11B. If yes, are you currently in competition season?
    a. Yes
    b. No
12. Do you participate in intermural sports?
   a. Yes  
   b. No
   12A. If yes, what sport do you participate in?
   12B. If yes, are you currently in competition season?
      a. Yes  
      b. No

13. During the Fall 2014 semester, what time do your Friday classes start?
   a. 8 AM  
   b. Between 8 AM and 10 AM  
   c. Between 10 AM and Noon  
   d. After Noon  
   e. I do not have Friday classes

14. Are you currently in the military or ROTC?
   a. Yes, military  
   b. Yes, ROTC  
   c. Neither

15. What is your sexual orientation?
   a. Completely heterosexual  
   b. Mostly heterosexual  
   c. Equally heterosexual and homosexual  
   d. Mostly homosexual  
   e. Completely homosexual

16. What is your parents’ marital status?
   a. Married  
   b. Separated  
   c. Divorced and one or both parents remarried  
   d. Divorced but not remarried  
   e. Single parent  
   f. Other

17. Are both of your parents living?
   a. Yes  
   b. No

18. Do you currently have a leadership position on campus?
   a. Yes  
   b. No

19. What is the highest level of education your mother has obtained?
   a. Homeschooled/never attended  
   b. Some high school  
   c. High school degree  
   d. Some college  
   e. College/Associate’s degree  
   f. Advanced degree (Master’s, Doctorate)

20. What is the highest level of education your father has obtained?
   a. Homeschooled/never attended  
   b. Some high school  
   c. High school degree  
   d. Some college  
   e. College/Associate’s degree  
   f. Advanced degree (Master’s, Doctorate)

21. What is your family’s income?
   a. Under $25,000  
   b. $25,001-$50,000  
   c. $50,001-$65,000  
   d. $65,001-$80,000  
   e. $80,001-$100,000  
   f. $100,001-$150,000  
   g. $150,001-$200,000  
   h. Above $200,000  
   i. Don’t know
e. $80,001-$100,000

22. What is your current GPA?

23. What is your email address?

24. What is your height, in feet and inches?

25. What is your current weight in pounds?

26. Rate your happiness with your current weight
   a. Completely happy      d. Somewhat unhappy
   b. Somewhat happy        e. Completely unhappy
   c. Neither happy nor unhappy

27. Are you currently receiving treatment for an eating disorder?
   a. Yes                    d. No
Appendix C

Alcohol Use Questions

A drink is defined as a 12 ounce beer, a 1 ounce shot of liquor, or a 4 ounce glass of wine. The following questions are about your use of alcoholic beverages, including beer, wine, malt liquor, hard liquor, or mixed drinks.

1. Have you ever had an alcoholic beverage to drink?
   a. Yes
   b. No

2. How old were you when you consumed your first drink of alcohol?

3. Have you consumed alcohol in the past thirty days?
   a. Yes
   b. No

4. In a typical week, how many days do you have at least one drink containing alcohol? (Answers can range from 0-7)

5. How many drinks do you have on a typical day when you are drinking?
   a. 0-1 drinks
   b. 2-3 drinks
   c. 4-5 drinks
   d. 6-7 drinks
   e. 8 or more drinks

6. During the last 30 days, what is the highest number of drinks that you drank in one night?

7. Please estimate your average alcohol consumption for each day of the week for the last 3 months.
   Monday:  
   Tuesday:  
   Wednesday:  
   Thursday:  
   Friday:  
   Saturday:  
   Sunday:  

8. In the last month, have you had 5 or more (for males) or 4 or more (for females) drinks in a row?
   a. Yes, and I do not intend to stop drinking 5 or more (4 or more) drinks in a row
   b. Yes, but I intend to stop drinking 5 or more (4 or more) drinks in a row during the next 6 months
   c. Yes, but I intend to stop drinking 5 or more (4 or more) drinks in a row during the next 30 days
   d. No, but I have had 5 or more (4 or more) drinks in a row in the past 6 months
   e. No, and I have not had 5 or more (4 or more) drinks in a row in the past 6 months
   f. No, I have never had 5 or more (4 or more) drinks in a row
9. Think back over the last month. How many times have you consumed 5 or more drinks in one day?
   a. Never
e   b. Once
c. 2 to 3 times
d. 4 to 6 times
e. 7 or more times

10. Have you ever drank until you got drunk or intoxicated?
    a. Yes, and I plan to again
   b. Yes, but I don’t plan on ever getting drunk again
   c. No, but I think I might try in the next 6 months
d. No, and I don’t plan to

11. Did you drink until you got drunk or intoxicated at least once in the last month?
    a. No, I have not been drunk in the last 6 months
   b. No, I have not been drunk in the last month, but I have been drunk in the last 6 months
c. Yes, but I intend to stop getting drunk in the next 30 days
d. Yes, but I intend to stop getting drunk in the next 6 months
e. Yes, and I do not intend to stop getting drunk

12. Blacking out is defined as a portion of time when you have an inability to recall the past due to the intake of alcohol. With this in mind, have you ever blacked out?
    a. Yes
   b. No

13. Extreme drinking is defined as the planned or unplanned consumption of alcohol in greater quantity than you normally would on a drinking occasion (i.e. drinking more than you usually do). With this in mind, have you ever participated in extreme drinking?
    a. Yes
   b. No

14. Have you ever blacked out as a result of extreme drinking?
    a. Yes
   b. No
Appendix D

Rutgers Alcohol Problem Index (RAPI),

Different things happen to people while they are drinking ALCOHOL or because of their ALCOHOL drinking. Several of these things are listed below. Indicate how many times each of these things happened to you WITHIN THE LAST YEAR.

Use the following code:
0 = Never
1 = 1-2 times
2 = 3-5 times
3 = 6-10 times
4 = More than 10 times

HOW MANY TIMES HAS THIS HAPPENED TO YOU WHILE YOU WERE DRINKING OR BECAUSE OF YOUR DRINKING DURING THE LAST YEAR?
0 1 2 3 4 Not able to do your homework or study for a test
0 1 2 3 4 Got into fights with other people (friends, relatives, strangers)
0 1 2 3 4 Missed out on other things because you spent too much money on alcohol
0 1 2 3 4 Went to work or school high or drunk
0 1 2 3 4 Caused shame or embarrassment to someone
0 1 2 3 4 Neglected your responsibilities
0 1 2 3 4 Relatives avoided you
0 1 2 3 4 Felt that you needed more alcohol than you used to in order to get the same effect
0 1 2 3 4 Tried to control your drinking (tried to drink only at certain times of the day or in certain places, that is, tried to change your pattern of drinking)
0 1 2 3 4 Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking
0 1 2 3 4 Noticed a change in your personality
0 1 2 3 4 Felt that you had a problem with alcohol
0 1 2 3 4 Missed a day (or part of a day) of school or work
0 1 2 3 4 Wanted to stop drinking but couldn't
Suddenly found yourself in a place that you could not remember getting to
Passed out or fainted suddenly
Had a fight, argument or bad feeling with a friend
Had a fight, argument or bad feeling with a family member
Kept drinking when you promised yourself not to
Felt you were going crazy
Had a bad time
Felt physically or psychologically dependent on alcohol
Was told by a friend, neighbor or relative to stop or cut down drinking
## Appendix E

### Eating Attitudes Test-26 (EAT-26)

Garner & Garfinkel, 1979

Check a response for each of the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Always</th>
<th>Usually</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am terrified about being overweight</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. I avoid eating when I am hungry.</td>
<td></td>
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<tr>
<td>3. I find myself preoccupied with food.</td>
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<tr>
<td>4. I have gone on eating binges where I feel I may not be able to stop.</td>
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<tr>
<td>5. I cut my food into small pieces.</td>
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<td></td>
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<tr>
<td>6. I am aware of the calorie content of foods that I eat.</td>
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<tr>
<td>7. I particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes)</td>
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<tr>
<td>8. I feel that others would prefer if I ate more.</td>
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<tr>
<td>9. I vomit after I have eaten.</td>
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<tr>
<td>10. I feel extremely guilty after eating.</td>
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<tr>
<td>11. I am occupied with a desire to be thinner.</td>
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<tr>
<td>12. I think about burning up calories when I exercise.</td>
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</tr>
<tr>
<td>13. Other people think I am too thin.</td>
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<tr>
<td>14. I am preoccupied with the thought of having fat on my body.</td>
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<tr>
<td>15. I take longer than others to eat my meals.</td>
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<tr>
<td>16. I avoid foods with sugar in them.</td>
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<tr>
<td>17. I eat diet foods.</td>
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<tr>
<td>18. I feel that food controls my life.</td>
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<tr>
<td>19. I display self-control around food.</td>
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<td></td>
</tr>
<tr>
<td>20.</td>
<td>I feel that others pressure me to eat.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>21.</td>
<td>I give too much time and thought to food.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>I feel uncomfortable after eating sweets.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>I engage in dieting behavior.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>24.</td>
<td>I like my stomach to be empty.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>I have the impulse to vomit after meals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>I enjoy trying new rich foods.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

43
Appendix F

Compensatory Eating and Behaviors in Response to Alcohol Consumption Scale (CEBRACS), Rahal, Bryant, Darkes, Menzel, and Thompson (2012)

Please read each of the following statements very carefully and respond accurately and honestly. All of these statements reflect actual behaviors you may have done in the past 3 months. You will be asked whether you have done any of the behaviors before, during, or after drinking alcohol. Please read carefully because many of the statements are closely related to each other. Drinking refers to drinking any alcohol beverages such as: beer, wine, wine coolers or spirits, hard liquors, or mixed drinks.

BEFORE drinking

Instructions: For the following statements think about behaviors you have engaged in BEFORE you anticipated drinking alcohol. That is, think of situations where you knew you would be drinking alcohol in the future (e.g. planned to go out drinking with friends, attended a wedding or birthday where you planned to drink, or attended any other event or situation where you knew you would be drinking later).

Rate your behaviors using the following scale:

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost all the time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>About 25% of the time</td>
<td>About 50% of the time</td>
<td>About 75% of the time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

___1) In the past 3 months, I have eaten less than usual during one or more meals before drinking to get DRUNKER.

___2) In the past 3 months, I have exercised before drinking to make up for the calories in alcohol that I anticipated consuming.

___3) In the past 3 months, I have eaten less than usual during one or more meals before drinking to feel the effects of alcohol FASTER.

___4) In the past 3 months, I have skipped one or more meals before drinking to make up for the number of calories in alcohol that I anticipated consuming.
5) In the past 3 months, I have taken laxatives before drinking to make up for the calories in alcohol that I anticipated consuming.

6) In the past 3 months, I have skipped one or more meals before drinking to feel the effects of alcohol FASTER.

WHILE under the effects of alcohol

Instructions: For each of the following statements, think about behaviors you have engaged in WHILE you were drinking or under the effects of alcohol (e.g. while you were drinking during a wedding reception, party, bar, club, football game). This also includes situations where you may have been done drinking, but the effects of alcohol had not completely worn off. As an example, imagine arriving home from a party where you had been drinking and you could still feel the effects of alcohol even though you had stopped drinking earlier in the night.

Rate your behaviors using the following scale:

Never    Rarely    Sometimes    Often    Almost all the time

About 25% of the time    About 50% of the time    About 75% of the time

1            2            3            4            5

7) In the past 3 months, I have eaten less than usual while I was drinking because I wanted to feel the effects of the alcohol FASTER.

8) In the past 3 months, I have taken diuretics while I was drinking to make up for the calories in alcohol that I was consuming.

9) In the past 3 months, I have not eaten at all while I was drinking because I wanted to feel the effects of the alcohol FASTER.

10) In the past 3 months, I have eaten low-calorie or low-fat foods while I was drinking to make up for the calories in alcohol that I was consuming.

11) In the past 3 months, I drank low-calorie beer or alcoholic drinks to get fewer of the calories that are in alcohol.

12) In the past 3 months, I have eaten less than usual while I was drinking because I wanted to get DRUNKER.
13) In the past 3 months, I have taken laxatives while I was drinking to make up for the calories in alcohol that I was consuming.

14) In the past 3 months, I have not eaten at all while I was drinking because I wanted to get DRUNKER.

AFTER effects from alcohol have worn off

Instructions: For each of the following statements, think about behaviors you have engaged in AFTER you had been drinking alcohol and were no longer under the effects of alcohol. This might include your behavior later that same day, the next day, or several days after the effects of alcohol have worn off.

Rate your behaviors using the following scale:

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost all the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

15) In the past 3 months, I have taken diuretics to make up for the calories in alcohol that I had consumed previously while I was under the effects of alcohol.

16) In the past 3 months, I have eaten low-calorie or low-fat foods during one or more meals to make up for the calories in alcohol that I had consumed previously while I was under the effects of alcohol.

17) In the past 3 months, I have taken laxatives to make up for the calories in alcohol that I had consumed previously while I was under the effects of alcohol.

18) In the past 3 months, I have exercised to make up for the calories in alcohol that I had consumed previously while I was under the effects of alcohol.

19) In the past 3 months, I have made myself vomit to make up for the calories in alcohol that I had consumed previously while I was under the effects of alcohol.

20) In the past 3 months, I have eaten less than usual during one or more meals to make up for the calories in alcohol that I had consumed previously while I was under the effects of alcohol.
21) In the past 3 months, I have skipped an entire day or more of eating to make up for the calories in alcohol that I had consumed previously while I was under the effects of alcohol.

Note. For scoring purposes —

Factor 1: Alcohol Effects (Items 1, 3, 6, 7, 9, 12, 14)
Factor 2: Bulimia (5, 8, 13, 15, 17, 19)
Factor 3: Diet and Exercise (2, 10, 11, 16, 18, 20)
Factor 4: Extreme Restriction (4, 21).