

Binge Drinking Among College Students:
Impact of Gender, Socioeconomic Status, and Athletic Participation
on Prevalence, Motives, and Consequences

by

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ABSTRACT

Binge drinking is one of the most widespread and dangerous forms of substance abuse in the United States, especially among college students. Numerous studies have been conducted in hopes of understanding the influence that various factors might have on binge drinking. The present study builds upon existing literature by examining the role of several key demographics (gender, socioeconomic status, and athletic participation) on not only the prevalence of binge drinking, but also motivations, expectancies, and consequences. Sixty-two Wesleyan University students enrolled in an introductory psychology course were administered an electronic survey. The survey asked students to answer demographic questions along with measures about drinking behaviors, motivations, expectancies, and consequences. The results revealed that the overall prevalence of binge drinking was comparable to previous studies and that rates were higher among athletes. The results showed that enhancement, social, and coping motivations were higher for binge drinkers and that both gender and socioeconomic status had an impact on motivations. Findings demonstrated that all expectancies were higher among binge drinkers, with negative expectancies being lowest. There was also an interaction between socioeconomic status and expectancies. Finally, analyses indicated that binge drinking was associated with more negative consequences and that both socioeconomic status and athletic participation had an influence. The results from this study further our understanding of binge drinking prevalence, motives, and consequences among college students and may therefore inform prevention, intervention, and treatment efforts.

INTRODUCTION

According to the Harvard School of Public Health College Alcohol Study, binge drinking is defined generally as the consumption of so much alcohol as to place individuals who are drinking and those around them at increased risk of experiencing negative consequences, whether direct alcohol-related or indirect effects (Wechsler, 2008). These negative consequences include physical problems, such as health risks, injury, and even death, as well as social and behavioral consequences including diminished work or academic performance, violence, sexual assault, and legal troubles (Hingson, 2005). College students represent a particularly at-risk population for binge drinking due to their age and certain pressures present in the environment. The prevalence of binge drinking on college and university campuses is substantially higher than the national norm (Borden et al., 2011; Chauvin, 2012; Ham & Hope, 2003). Among certain groups of college students, the prevalence of binge drinking is even higher. Students who play organized collegiate athletics are at even greater risk to partake in binge drinking and to suffer from its effects (Chauvin, 2012; Dietz, 2008; Doumas, Haustveit, & Coll, 2010; Newton, 2015). The quantifiable effects of binge drinking on college students are sobering. Every year in the US, more than 600,000 unintentional injuries, 650,000 sexual assaults and 1,800 alcohol-related deaths are reported on college campuses as having been associated with binge drinking (Newton, 2015).

Because binge drinking is so widespread on college campuses and, moreover, because its effects are so pernicious, it represents a significant public health and safety concern for colleges and universities. Prevention and intervention efforts on the

part of higher-ed administrators to reduce the prevalence of binge drinking among college students have ranged from alcohol-education programs to general social-norms media campaigns, to targeted interventions. Despite these efforts, however, binge drinking has proven for the most part stubbornly resistant to prevention and intervention strategies (Newton, 2015).

In order to better understand factors that might contribute to binge-drinking and confer risk, the present study explores binge drinking at Wesleyan University, a four-year liberal arts college in Middletown, Connecticut. In particular, this study examines the prevalence of binge drinking, which demographic factors are associated with risk, as well as the motivations, expectancies, and consequences of binge drinking. A better understanding of these issues can hopefully draw greater awareness to the pervasiveness of binge drinking on college campuses, identify the most at-risk students, increase understanding of the reasons for binge drinking, and thus, contribute to the development of better prevention, intervention, and treatment programs.

Definitions of Binge Drinking

The subject of binge drinking has been explored across a wide array of academic fields, including psychology, medicine, education, public health, and social work. Each field of research has approached the problem from a different discipline-specific perspective, but there is general consensus among all fields to support the claim that binge drinking has profound negative consequences, both for the individual partaking in binge drinking and for college campuses where binge drinking most often takes place. A review of the literature defining binge drinking, exploring its

prevalence among various demographics, identifying at-risk populations, describing its pernicious effects, examining the motivations and expectancies that lead to binge drinking, and reviewing prevention and intervention efforts will lay crucial groundwork for the current study which aims to better understand who is most affected by binge drinking and why in order to help with recognition, prevention and intervention efforts.

There are various definitions of binge drinking that appear throughout the published literature; these include definitions based on threshold and/or quantity of consumption, on blood alcohol content (BAC), and on negative impact in relation to quantity on a three-level scale. The most widely cited definition of binge drinking consists of a threshold level of consumption in a fixed period of time. For men, the standard is set at five or more drinks consumed in two hours, and for women, the amount is slightly lower, at four or more drinks consumed in two hours (Borden et al., 2011; CDC, 2012; Wechsler & Nelson, 2001). This definition is sometimes referred to as 5/4. A drink is defined as half an ounce of alcohol, roughly equal to the alcohol contained in a 12-ounce beer, an 8-ounce serving of malt liquor, a 5-ounce glass of wine, or a 1.5- ounce shot of distilled spirits (Wechsler & Nelson, 2001). This definition is useful, not only because it is widely accepted, but also because the simplicity of the threshold level definition can easily be communicated and applied to help individuals monitor their drinking. If there is a downside to this definition, it is the fact that it does not suitably capture individual levels of intoxication resulting either from greater tolerance to alcohol or from drinking beyond the 5/4 measure (Hingson, Zha, & White, 2017; Newton, 2015).

The BAC definition of binge drinking is a pattern of alcohol consumption that produces a BAC of 0.08% or above (NIAA, 2015; Seo & Li, 2009). One benefit of this definition is that it allows for variabilities in body size, rate of alcohol metabolism, gender, and tolerance to yield different outcomes in terms of number of drinks that would constitute a binge. While the expectation is that the consumption of four or five drinks (for women and men, respectively) in two hours' time will result in a BAC of approximately 0.08%, it is entirely possible that one person may consume many more drinks in a fixed time than another and still have the same or lower BAC. However, this same benefit is also a drawback when it comes to defining binge drinking for research or educational purposes. This definition lacks practical utility since individuals are generally unaware of their BAC while they are drinking (Newton 2015). Additionally, the BAC definition it is only about 50% effective in identifying at-risk drinkers, as determined by the Alcohol Use Disorders Identification Test (AUDIT) (Fillmore & Jude, 2011). Because of these issues, most researchers and educators instead define binge drinking according to the threshold quantity 5/4 standard described above.

Nevertheless, even the definition of binge drinking in terms of a minimum quantity of drinks consumed in a fixed time period is not entirely uncontroversial. Some researchers believe that the threshold quantity 5/4 definition might not be specific enough to adequately assess and evaluate drinking behaviors, since beyond the initial threshold of binge drinking very different amounts of alcohol consumption can occur (Hingson, Zha, & White, 2017). These studies have focused on the “or more” piece of the standard binge threshold definition and instead propose a more

nuanced approach that includes a three-level classification system. According to this system, Level I drinkers drink one to two times the standard gender-specific 5/4 binge threshold; Level II drinkers drink two to three times the 5/4 threshold; and Level III drinkers drink three or more times the 5/4 threshold (Hingson, Zha, & White, 2017). Perhaps not surprisingly, Level II and Level III binge drinkers tend to have higher odds of negative post-drinking consequences including driving while intoxicated, physical fights, injuries, emergency room visits and legal issues, such as arrests and detentions. While the specificity of this definition is useful, especially in connecting higher levels of binge drinking with higher odds of negative impact, the fact that it is not as clear-cut or as widely used as the threshold quantity definition, makes it slightly less useful for research purposes. What is more, the gradations in binge drinking that this definition offers may produce a false sense of security among Level I (5/4) binge drinkers who may see their consumption as more acceptable than Levels II (10/8) or III (15/12) bingers, and thus feel less motivated to curtail it.

Still, the 5/4 threshold definition has also been criticized for being too limiting, and as a result, some binge drinkers may fail to recognize themselves through the application of this standard, either because they reach intoxication at a lower threshold or because the consumption of 5 drinks for men or 4 for women might not lead to intoxication in individual cases. An alternative definition proposed to counter this critique is a much broader and more inclusive definition of binge drinking that defines binge drinking as any pattern of alcohol use that leads to rapid intoxication, typically in a span of several hours (Chavin, 2012; Herschl et al., 2012; Newton 2015). This definition has the benefit of being widely applicable to numerous

patterns of alcohol consumption that college students engage in and does not require students to keep track of how many drinks they have consumed or to know their BAC, but only to recognize that they are intoxicated (Newton 2015). However, it has two marked disadvantages: first, its broad applicability fails to account for specific differences in drinking patterns and second, it relies on students' subjective determination of what constitutes "rapid intoxication".

While no definition is perfect, the 5/4 threshold definition has the advantage of being widely used, simple to measure and apply, and objective. For these reasons, it is the definition that informs this study.

Prevalence and Demographics

In order to better understand the prevalence of binge drinking in US society in general and on college campuses specifically and to thus be able to develop more targeted awareness and intervention programs, one must also understand how prone different groups are to engage in binge drinking. The predisposition towards and prevalence of binge drinking have been tied to a number of factors including age, college environment, gender, socioeconomic status, and participation in collegiate athletics.

Age. According to the 2015 National Survey on Drug Use and Health, 86.4% of adults (>18 years of age) in the US report drinking alcohol at some point in their lives, 70.1% report having done so in the past year, and 56.9% report drinking in the past month. (NIAAA, 2015; SAMHSA, 2015). In that same survey, 26.9% of adults report that they engaged in binge drinking in the past 30 days; among 18-25 year olds, the rate increases to 39%. This last figure translates to 13.6 million young adult binge

drinkers in the US, or two out of every five. While binge drinking occurs across the entire lifespan, the highest percentage of binge drinking occurs between the ages of 18-25 years, and especially between 18 and 22 (CDC, 2012; Kelly-Weeder et al., 2011). Binge drinking is considered one of the “risky behaviors” that adolescents partake in, and starts at least as early as high school. More specifically, studies show that 20% to 25% of high school students admit to having binge drunk in the past fourteen days (Kelly-Weeder et al., 2011; Shatkin, 2017). By 18-22, the age at which most students attend college, that rate doubles to more than 40% (Newton, 2015; Wechsler et al., 2000).

College environment. The majority of the 18-25 age demographic which accounts for the highest percentage of binge drinking corresponds with college age for most US students. A 1993 study surveyed 17,592 students on 140 different college campuses and found that 44% of the students had engaged in binge drinking (operationally defined as above four or more drinks for women and five or more for men in a two-hour period) in the previous two weeks (Wechsler, 1994). For nearly a third of the campuses surveyed, more than 50% of students reported binge drinking in the previous two weeks; on some campuses the figure was as high as 70% (Wechsler, 1994, 1995, 1996, 1998, 2000, 2001; NIAAA, 2002, 2015, 2017).

This is in part a reflection of the prevalence of drinking in general on college campuses. Although alcohol consumption rates among college students have remained relatively stable throughout the past two decades, those rates are remarkably high at 80-90% (Dietz, 2008; Newton, 2015). This statistic, alongside the fact that more than 40% of college students binge drink, suggests that at least half of college

students who drink, which constitutes a vast majority, are binge drinking on a regular basis. The question of whether the prevalence of binge drinking on college campuses is merely a function of the age demographic of college students was answered by a 2015 study that found that binge drinking among college students is over 5% higher than binge drinking among 18-22 year olds who were not attending college (NIAAA, 2002, 2015; SAMHSA, 2015). The same pattern is true for alcohol consumption in general (i.e., not just binge drinking) on college campuses, although there the difference is even starker; 58% of college students report having consumed alcohol in the last month, compared with 48.2% of 18-22 year olds not in college (NIAAA; SAMHSA, 2015). These studies suggest that college life itself, rather than just the age at which students attend college, might contribute to alcohol consumption and to binge drinking.

One particular aspect of college life that is associated with the high prevalence of binge drinking among students is the way in which they tend to consume alcohol, which differs from the way alcohol is generally consumed outside of a college environment. Collegiate drinking behaviors include pre-gaming (or drinking to get drunk in anticipation of a social event or party), participation in drinking games, and celebratory drinking, often tied to sporting events, tailgating, or 21st birthday celebrations (Borden et al, 2001; Bhullar et al, 2012; Foster et al, 2011; Newton 2015). All of these drinking behaviors encourage the consumption of excessive quantities of alcohol over a limited window of time, in other words, binge drinking. Not coincidentally, students who engage in these patterns of binge drinking behavior

are at increased risk of suffering the negative effects of excessive alcohol consumption (Foster et al, 2011; Newton, 2015).

Gender. Gender is another factor that has been linked to differences in alcohol use, and more specifically, to binge drinking behavior. Like alcohol use in general, binge drinking is more prevalent among males than it is among females (Cranford et al., 2006; Newton, 2015; Wechsler et al., 1994; Wechsler, Dowdall, Davenport, & Castillo, 1995). Of the 65.25 million adults who reported binge drinking in the past month on the 2015 National Survey on Drug Use and Health mentioned above (representing 26.9% of the total surveyed), 57.7% of the binge drinkers were male, and 42.3% were female (SAMHSA, 2015). This corresponds to more than 32% of all adult males reporting binge drinking in the last 30 days, compared to 22% of all adult females (Courtney & Polich, 2009; SAMHSA). Among 18-25 year olds (roughly the age of most college-aged students), the distinction holds. Compared to 41.3% of 18-25 year-old males who reported binge drinking in the past month, 36.8% of 18-25 year-old females did. The College Alcohol Study demonstrates a similar pattern by gender for binge drinking among college students; roughly 50% of male and 39% of female students reported binge drinking behavior (Wechsler et al., 1994; Wechsler, Dowdall, Davenport, & Castillo, 1995).

More recent studies confirm that male students drink more alcohol, drink more frequently, and engage in binge drinking more often than their female peers. (Neighbors, 2007; O'Malley and Johnston, 2002). While results from studies have been fairly consistent regarding binge drinking behavior, the findings in terms of negative consequences have been inconclusive. Different studies have come to

different conclusions regarding whether male or female students experience more negative consequences as a result of binge drinking, with some theorizing that male students experience more public consequences and female students experience more private consequences (Ham & Hope, 2003; Messman-Moore et al, 2014; Neighbors et al., 2007; Newton, 2015; Norberg et al, 2007; Pedersen, 2013; Perkins, 2002).

Socioeconomic status. Socioeconomic status is another factor that may play a role in determining binge drinking, but with results that are less clear cut. Binge drinking does appear to be more prevalent among those with an annual household income of \$75,000 or greater (20.2%); however, for lower income earners, and in particular for those with an annual household income of less than \$25,000, binge drinking happens with greater frequency (5 episodes per month) and higher quantities (8.5 drinks per occasion) (CDC Vital Signs, 2012). In general, socioeconomic status as measured by income, has been found to have a positive relation to alcohol abuse patterns, including binge drinking, but an inverse relationship to negative outcomes of excessive alcohol consumption (including binge drinking) (Collins, 2016; Keyes & Hasin, 2008). In other words, those with higher incomes are more likely to partake in binge drinking, but those with lower income were more likely to suffer from its negative effects.

Insofar as young adults are concerned, higher parental income and higher level of parental education, two markers of high socioeconomic status, both seem to contribute to a higher prevalence of binge drinking (Humensky, 2010). In the case of younger adolescents, the opposite has generally held to be true: lower parental income and lower level of parental education typically result in higher levels of

substance abuse, including binge drinking, although more recent studies suggest that adolescents with higher socioeconomic status are increasingly equally at risk for substance abuse. (Humensky, 2010).

Athletic participation. Finally, college athletes constitute a high-risk group for binge drinking. Studies have consistently found links between participation in college organized sports and binge drinking (Davenport et al., 1997; Dietz, 2010; Green, Nelson, Hartmann, 2014; Newton, 2015; Turrisi et al., 2006; Wechsler, 2001). This holds true across racial and gender lines. In other words, female student-athletes drink more than female non-student-athletes, African-American student-athletes drink more than African-American non-student-athletes, and so on (Doumas & Midgett, 2015; Green et al, 2014). In addition to drinking more heavily and more frequently than their non-athlete peers, college athletes tend to approve of higher levels of drinking and/or consider them more normative (Doumas et al, 2010; Ford, 2007; Newton, 2015). Student-athletes also suffer more of the negative consequences associated with excessive drinking; this holds especially true for African-American student-athletes who report higher level of problems stemming from binge drinking than their white counterparts (Doumas & Midgett, 2015; Leichleiter, Meilman, Presley, & Cashin, 1998).

In terms of specific roles within athletics, certain individuals do not appear to be immune. In one study, athletic leaders (i.e., college team captains) were not found to be more responsible than other team members with respect to drinking, and male captains in particular actually consumed more alcohol, binged more often, and suffered more negative consequences from excessive alcohol use in comparison to

other team members and to female captains (Leichleiter, Meilman, Presley, & Cashin, 1998). Finally, the correlation between collegiate athletic participation and binge drinking extends beyond the time that students play organized sports in college, but continues after graduation. Those who played organized sports seem to continue to binge drink more than those who did not (Green et al, 2014; Newton, 2015).

Consequences of Binge Drinking

The negative consequences of binge drinking are significant and damaging at both an individual and a community level. Before exploring those consequences in greater detail, it is useful to first review who is most affected by alcohol-related consequences. To begin with, individuals who participate in binge drinking are more likely than those who do not to suffer negative consequences associated with excessive alcohol consumption (Hingson, Zha, & White, 2017; Newton, 2015). While studies have long made the case that women experience negative consequences of alcohol earlier and to a more pronounced degree than men, more recent studies are beginning to challenge those claims with data suggesting that female college students are reporting fewer alcohol-related negative consequences than their male classmates (Nolen-Hoeksema, 2004; Wagoner, 2012). Socio-economic status has an inverse relation to negative consequences; individuals with lower socioeconomic status suffer greater negative consequences than those with higher socioeconomic status (Collins 2016). This is further exacerbated when race and ethnicity are brought to bear. Individuals with low socio-economic status who are also member of racial or ethnic minorities experience even greater alcohol-related negative consequences (Collins 2016; Witbrodt et al, 2014). Finally, student-athletes also experience greater negative

consequences from alcohol consumption than non-athletes (Nelson and Wechsler, 2001).

Binge drinking causes the same negative consequences as alcohol intoxication, but because binge drinking accelerates the rate of intoxication, the negative effects are likewise accelerated. Effects can be classified as primary or secondary. Primary effects may be short-term or long-term and for the most part impact the individual who is drinking. Short-term primary effects tend to be behavioral-physiological in nature, while the most serious long-term effects are physiological. The primary effects of binge-drinking are dangerous not only in themselves, but because they also lead to secondary effects (i.e., actions and decisions that can endanger both self and others (NIAAA, 2015). Secondary effects impact the individual as well as the surrounding community and are especially hard-hitting to college campuses. The amount and extent of negative consequences that stem from binge drinking underscore the need to better understand the phenomenon, especially among the most at-risk college students, in order to raise awareness and devise better prevention and intervention programs.

Primary effects. Primary effects of binge drinking occur as a result of the fixed metabolic rate of alcohol. When alcohol is consumed, it is absorbed into the bloodstream from the stomach and intestines in order to be metabolized by enzymes in the liver. The liver, however, can metabolize only a certain amount of alcohol per hour, regardless of how much alcohol is consumed (NIAAA, 1997). The inability of liver enzymes to metabolize alcohol at a rate consistent with its consumption results in ethanol molecules' remaining in the blood. Because these molecules are so small,

they are able to pass into the gaps between brain cells, interfering with the neurotransmitters that regulate the brain's activities (Frontier, Keane, Leritz, et al, 2014). The faster the rate of consumption, the more ethanol "floods" the brain, resulting in intoxication. This process is aggravated by binge drinking insofar as it accelerates the rate at which ethanol molecules interfere with neurotransmitters.

The primary short-term behavioral-physiological effects of alcohol intoxication caused by binge drinking include, but are not limited to: imbalance, ataxia, motor impairment, incoordination, stumbling, instability, speech impairments and slurred words, lowered decision making ability, impaired vision, memory loss, erratic behavior, decreased concentration, nausea, breathing difficulties, reduced inhibitions, euphoria, and depression, and confusion (NIAA, 2002). Perhaps the most extreme short-term physiological consequence of binge drinking is alcohol poisoning, which can potentially result in coma or death. Death from alcohol poisoning kills six people per day in the US and over 1,800 alcohol-related deaths occur on college campuses each year (Newton, 2015).

There are also a number of long-term primary effects that individuals suffer as a result of the over-consumption of alcohol. The most serious of these are physiological and result in permanent damage to the brain, heart, and liver. Long term consequences of binge drinking are extremely serious and largely invisible in the short-term.

The brain seems to be under the most distress as a result of binge drinking. Not only does it directly experience short term intoxication effects resulting in behavioral-physiological impairments, as noted above, but it also suffers some of the

greatest long-term tolls, including Wernicke-Korsakoff Syndrome. Individuals who experience this syndrome struggle with memory and learning abilities and have increased incoordination in their motor functions and bodily movements. Walking, for example, is often extremely difficult (NIAAA, 2004 B). There are other forms of brain damage that can result from alcohol abuse in general and binge drinking in particular, perhaps the most common of which are neurocognitive deficits for frontal lobe processing and memory operations (Courtney & Polich, 2009). Encephalopathy, often co-morbid with alcohol-induced liver cirrhosis, is a severe and sometimes fatal brain disorder in which individuals experience decreases in logical and reasoning functioning, motor abilities and coordination, and speech abilities.

The heart is also subject to many long-term negative consequences of alcohol abuse. The most common long-term cardiovascular effects of excessive alcohol consumption are an increase in triglycerides, or fat, in the bloodstream and raised blood pressure (Maisch, 2016). Alcohol use can also lead in the long term to improper beating of the heart; this is known as cardiac arrhythmia and occurs when the heart either beats too fast or too slow to successfully perform its necessary functions. Cardiomyopathy, or damage to the heart muscle tissue, is one of the most severe longer term effects of alcohol consumption (NIAAA, 2004 B) Stroke and sudden cardiac death are also more likely to occur among those who engage in alcohol abuse, in particular prolonged binge drinking (Maisch, 2016).

The liver is the body's primary alcohol processor and as such, is subject to some of the most severe long-term effects of alcohol abuse. To expand on the alcohol metabolizing process briefly described above, a liver enzyme, alcohol dehydrogenase,

metabolizes alcohol by converting ethanol into acetaldehyde; this is subsequently converted to acetate which is further broken down into carbon dioxide and water (NIAA., 2000). Because of its vital role in the body's processing of alcohol, over-consumption of alcohol subjects the liver to severe stress, resulting in permanent liver damage. This commonly takes the form of liver cirrhosis, which occurs as a result of extreme scarring, or fibrosis, of the organ tissues, and often leads to liver failure and, in some cases, death.

It is important to note that both the short and long-term primary effects of alcohol consumption can vary widely depending on such basic factors as body weight, gender, and the presence of food in the stomach, as well as on the frequency and quantity of consumption. Women, for example, are more susceptible to the physiological effects of extreme alcohol consumption than men, likely due to women's smaller amount of body water (NIAA, 1997). Nonetheless, drinking excessive alcohol, whatever that amount may be for a specific individual, and, moreover, doing so in short duration, elicits negative consequences for that individual's health and behavior both in the short and long run.

Secondary effects. The effects of excessive alcohol consumption and, in particular, binge drinking, do not, however, stop at the individuals involved in the behavior. Rather, the decisions and actions that binge drinkers make while intoxicated have negative repercussions both for themselves and for the communities surrounding them; these constitute alcohol's secondary effects. For individuals, secondary effects of alcohol consumption negatively impact both their social and mental well-being. Consequences that affect social well-being include poor performance in school or

work environments, difficulty maintaining healthy relationships, and legal consequences for their actions while intoxicated (Courtney & Polich, 2009; Humensky 2010; Newton 2015). Mental health related consequences include greater risk of anxiety and depression, emotional instability, and suicidal thoughts or behaviors (González et al, 2009; Newton 2015; Norbert et al., 2011; Pedersen, 2013). Almost half (47%) of binge-drinking students report having experienced five or more negative social or emotional consequences as a result of excessive alcohol consumption (Newton, 2015).

The secondary effects of binge drinking that impact both the individual and the community more broadly, include, but are not limited to: disruption to others, driving while intoxicated, vehicular accidents, unprotected sexual activity leading to unintended pregnancy or sexually transmitted diseases, unwanted sexual advances, acts of violence including sexual assault, accidents, falls, burns, and homicides (NIAAA, 2002, 2010, 2015). Of these, three in particular are highly correlated to excessive alcohol consumption and are especially devastating to college communities: sexual assault, violence, and driving while intoxicated (CDC, 2018). Other negative consequences, minor in comparison to these three, but with huge disruptive potential for those who experience them, are also prevalent on college campuses (Wecshler, Lee, Kuo, Sabring, Nelson, & Lee, 2002).

Sexual assault is perhaps the most serious and troubling secondary effect of binge drinking on college campuses. The National College Women Sexual Victimization Survey found that 20% to 25% of women are victims of attempted or completed rapes during their college careers. Other studies suggest that as many as

50% of college women have been victims of sexual assault and 27% of rape or attempted rape (Crowell & Burgess, 1996; Koss, 1988; Spitzberg, 1999). In approximately half of those cases, the perpetrator had been drinking alcohol (Abbey, et al., 1994; NIAAA, 2002). Other studies suggest that the numbers might be even higher. Among college women who were victims of sexual assault (ranging from sexual intimidation, to restraint, to completed rape), 68% reported their assailants had been drinking when the attack took place (Frintner & Rubinson, 1993). In 2001, alcohol was involved in 97,000 cases of campus sexual assault (including date rape) (Hingson, Heeren, Winter, & Wechsler, 2005; NIAAA, 2002). In a study of male college students, those who reported they drank heavily were more likely to have reported having committed sexual assault (Abbey et al., 1994; Koss & Dinero, 1998). Approximately half of sexual assault victims report having been drinking alcohol at the time of the assault (Abbey et al., 1994; NIAAA, 2002). While a woman should in no way be held responsible for being victim of sexual assault, her alcohol consumption may place her at increased risk.

Non-sexual violence is another secondary effect of binge drinking that is an acute problem on college campuses. Somewhere between 50% and 80% of the violence that takes place on college campuses appears to be fueled by alcohol (Roark, 1993). This corresponds to national trends suggesting that at least half of all violent crimes (on colleges and beyond) involve alcohol consumption by the perpetrator (in most cases), the victim, or both (Collins & Messerschmidt, 1993). To quantify this more concretely, an NIAAA-sponsored study found that each year, close to 1,000,000 US college students experience violence in the form of being hit or assaulted by

another student who has been drinking (Hingson, Heeren, Winter, & Wechsler, 2005). A more generalized form of campus violence that is in large part attributable to binge drinking are riots, especially after an important collegiate sporting event or, paradoxically, in protest of a university administration's tightening the policies around alcohol (NIAAA, 2002). In addition, celebratory campus drinking events have an especially negative impact on surrounding communities due to the violence and damage to property that ensues from them (Foster et al., 2011; Newton, 2015).

A third major negative effect of excessive alcohol consumption among college students that impacts both the individual drinking and the surrounding community is driving while intoxicated. Nearly 3 million students between the ages of 18 and 24 reported drinking and driving in the year 2001 alone (Hingson, Heeren, Winter & Wechsler, 2005). Furthermore, the NIAAA reports that more than 1,300 college students die each year from drinking and driving (NIAA, 2002).

While sexual assault, violence, and driving while intoxicated can be considered the most serious among the negative consequences of binge drinking that affect not just the individual student but the entire college campus community, there are other seemingly minor disruptions that also bear taking into consideration, given their extent. On heavy drinking campuses, roughly 62% of university students living in dormitories, fraternities, and sororities have experienced unwanted secondary effects of binge drinking (Wechsler, 1996). Even on less heavy drinking campuses, the number of students living in dorms who report having been disrupted by other students' binge drinking is about 35% (Wechsler, 1996). Moderate drinkers or abstainers are not immune from experiencing the secondary negative effects of binge

drinking; 60% have had study or sleep interrupted, nearly 50% have had to care for an intoxicated student, and another 30% have been insulted or humiliated by a binge drinking student (Wechsler, Lee, Kuo, Seibring, Nelson, & Lee, 2002). All of these factors are highly detrimental to non-binge drinking students' academic, physical and emotional well-being. Although these issues may seem minor compared to sexual assault or violence, their prevalence further underscores the costs of binge drinking not just on the individuals who partake in it, but on those surrounding them.

Motives: Expectancies and Motivations

In the past, the traditionally accepted theory for why high-school and college age students partake in “risk-taking behaviors” like binge drinking was that adolescents and, to a lesser degree, young adults, consider themselves invulnerable to the effects of risk and thus, unwittingly place themselves in dangerous situations such as those that excessive drinking gives rise to (Elkind, 1967). Yet, more recent studies suggest that far from considering themselves invincible, teens and young adults not only understand the dangers that stem from the risky behaviors they participate in, but even tend to overestimate those risks (Shatkin, 2017). This finding suggests that other factors must account for risk-taking behaviors. In the case of binge drinking, two important, and in some respects related factors, play a role. Students engage in binge drinking with different expectancies and with different motivations; these motivations and expectancies have been shown to have relationships with alcohol consumption behaviors and patterns. Understanding what students as whole, and different sub-groups, expect to feel when they binge drink as well as what motivates

them is therefore of critical importance to the development of effective prevention, intervention, and treatment programs.

Expectancies. Expectancies can be defined as individuals' beliefs about what the likely outcome of their alcohol consumption will be (Neighbors, 2007). Alcohol expectancies have been found to have a high positive correlation to alcohol consumption for all age groups and for all types of drinkers (Henderson, Goldman, Coover, & Carnevalla, 1994). As such, expectancy has been suggested to play a causal role in the determination of drinking behavior. Expectancy can perhaps best be understood as memory content that effectively links memory processes to later alcohol consumption (Henderson, Goldman, Coover, & Carnevalla, 1994; Rather et al., 1992). Applying a semantic network memory model to explain drinking decision processes, Rather and colleagues (1992) generated a theoretical alcohol expectancy model that mapped adjectives describing the expected effects of alcohol consumption according to two dimensions: dimension 1 was positive (social) versus negative (antisocial), and dimension 2 was arousing versus sedating. This produced a quadrant map of expectancy nodes in which different types of drinkers were located (Henderson, Goldman, Coover and Carnevalla, 1994; Rather et al., 1992). Heavy drinkers generally expected arousing effects, in contrast to light drinkers who expected sedation. Those in the two middle categories of alcohol consumption fell roughly in the middle of the arousal-sedation spectrum. Significantly, all drinking sub-groups, regardless of whether they were light, heavy, or somewhere in between, expected positive (social) effects (Neighbors, 2007; Rather et al, 1992).

It is important to note that, albeit a critical factor in predicting drinking behavior, expectancy does not work independently. Indeed, a number of recent studies have suggested it plays a mediating role, working together with other factors, and varying according to specific sub-groups (Henderson, Goldman, Coover, & Carnevalla, 1994; Nicolai, 2018; Tyler, Schmitz and Adams, 2017). There is still much work to be done in this area, particularly where binge drinking is concerned; the present study hopes to contribute to current understanding of the role of expectancies in relation to binge drinking, and of how expectancies vary among different sub-groups that have different risk levels for binge drinking.

Motivations. Like expectancies, certain motivations have been linked to alcohol consumption and help explain why students engage in binge drinking (Neighbors, 2007). The four-factor model of motivation, originally proposed by Cox and Klinger (1988), refined by Cooper (1994), and further developed in more recent literature, suggests that students drink alcohol for different motives, and that these motives largely determine their drinking behaviors. The four-factor model considers motivations to drink as the product of two different dimensions: valence of reinforcement (positive or negative) and source (external or internal) of the expected outcome (Chauvin, 2012; Cooper, 1994; Cox and Klinger, 1988; Kuntsche et al., 2005; Newton, 2015). The intersection or crossing of these two dimensions yields four possible motivations: enhancement, social, coping, and conformity. Enhancement motives are internally generated with positive reinforcement while social motives are externally generated with positive reinforcement. Conversely, coping motives are internally generated with negative reinforcement and conformity

motives are externally generated with negative reinforcement (Cooper 1994; Neighbors, 2007).

Four-factor model of motivation	<i>Positive reinforcement</i>	<i>Negative reinforcement</i>
<i>Internal source</i>	Enhancement	Coping
<i>External source</i>	Social	Conformity

On the positive reinforcement dimension, enhancement binge drinkers believe their consumption of alcohol will promote a positive mood and a feeling of well-being. Binge drinkers who endorse enhancement motives generally consume greater amounts of alcohol than those who endorse negatively reinforcing motives (Chauvin, 2012; Cooper, 1994; Newton, 2015). College binge drinkers often report enhancement as their primary motivation (González et al, 2009; Newton, 2015). Social binge drinkers also rely on positive reinforcement, but they are generated by external social pressures. Students who cite social motivations drink in order to obtain social rewards by either reducing social anxiety or increasing social relationships (Chauvin, 2012; Cooper, 1994; Newton, 2015). Like enhancement drinkers, social drinkers also tend to consume greater amounts than those who drink with negative reinforcement.

In terms of negative reinforcement, coping binge drinkers drink as a means of reducing or regulating negative emotions (Cooper, 1994). For these individuals, alcohol serves as a buffer that they believe will help them manage stress or difficult situations. Students who cite coping as their primary motivation for binge drinking suffer increased negative consequences as a result of their excessive alcohol use and often these students have co-presenting mental health concerns and higher risk for

suicide (Chauvin, 2012; González et al., 2009; Newton, 2015). Conformity drinkers are motivated by peer pressure or the desire to conform with a group's beliefs or practices in order to avoid social censure (Cooper, 1994; Newton, 2015). Students who are motivated by conformity tend to drink smaller amounts than those who are motivated by other factors (Chauvin, 2012; Neighbors, 2007). Conformity motives tend to be most prevalent among first-year college binge drinkers who drink excessively because they want to fit in (Newton, 2015). Research on the four-factor model of motivation for drinking has not found any gender differences in motivations for drinking. They are also prevalent among women with social anxiety, who drink in order to fit in (Bruckner & Shah, 2015).

This last point raises an important issue in the literature concerning the relation between motives and demographic differences in general, and gender difference in particular. Cooper's original study of motivations for alcohol consumption among adolescents suggested that the relation between drinking motives and drinking patterns or behaviors do not vary across demographic sub-groups in earlier years of adolescence, but found an increase in social and enhancement motives among boys in later adolescence (Cooper, 1994). Subsequent studies of college students have confirmed that social and enhancement drinkers tend to be male (Carrigan, Samoluk, & Stewart, 1998; Gire, 2002). A relevant corollary here is that a developmental trend is present: from undifferentiated motives at younger ages and through adolescence, to gender-specific motives in young adulthood. (Kuntsche et al, 2006).

Lack of Awareness and Misperceptions

Two factors that make binge drinking even more dangerous on college campuses are students' lack of awareness about it and their misperceptions about what are acceptable social norms. To begin with, many students do not realize that they are engaging in a high-risk behavior, believing that the number of drinks required to constitute binge drinking is far higher than it actually is (Wechsler & Kuo, 2000). When university students are asked to define binge drinking, they tend to grossly overestimate the amount of drinks required (Wechsler, 1999). This overestimation suggests, among other things, that the extent of binge drinking among university students may be under-reported.

The flip side of this lack of awareness is a misperception among college students about the extent of drinking that is taking place around them. College students falsely believe that the majority of their peers are participating in heavy drinking (regardless of whether they recognize it as binge drinking) and, consequently, they themselves participate in it as a means of social conformity, without realizing its dangers (Wechsler & Nelson, 2008). To compound this, there are significant discrepancies in what students perceive their peers' drinking levels to be and what those actual drinking levels are (Neighbors, 2007; Perkins & Berkowitz, 1986). Students consistently overestimate not only how much other students drink but also how many of their classmates are drinkers, falsely believing that higher levels of alcohol consumption by the majority of their classmates are in fact the norm. Because they see heavy drinking as typical, students are themselves more likely to engage in what they assume is normative behavior (Pilling & Brannon, 2007). Indeed, studies

show that only about 13% of students are able to correctly estimate the extent of binge drinking on their college campus (Perkins & Berkowitz, 1986; Pilling & Brannon, 2007; Wechsler, 1999). Despite the fact that binge drinking is one of the most common and potentially fatal behaviors among college students in the US, much remains to be done to raise student awareness and correct misperceptions.

Addressing Binge Drinking on College Campuses: Prevention and Intervention

Given the tremendously negative and in some cases fatal effects of binge drinking among college students, universities have spent significant resources attempting to curtail it, with only mixed results (Newton, 2015). Prevention and intervention strategies put in place on universities across the US resort to a variety of different approaches to tackle, or attempt to tackle, the problem of campus binge drinking. Traditional approaches tend to be educational in nature and often take the form of live or online classes that teach refusal skills, build up self-esteem, and raise awareness about the extent of binge drinking that is happening around them, and the associated negative consequences (Pilling & Brannon, 2007). These approaches increase what students know about the risks of alcohol consumption, but have not been successful in actually changing campus drinking behaviors or in reducing binge drinking rates (Perkins & Berkowitz, 1986).

The social norms approach is intended to correct the type of misperceptions that students have about what their fellow students are doing and specifically, about how much they are drinking, cited in the section above. It is one of the most widely used intervention strategies across colleges and universities (Newton, 2015; Pilling & Brannon, 2007). The theory behind the social norms approach is that students adjust

their drinking behavior to follow what they believe to be the norm; indeed, students' drinking behavior is more closely associated with their peers' perceived behavior than with their peers' actual behavior (Perkins & Berkowitz, 1986). Social norms campaigns use public service announcements, advertising, posters, flyers, and more recently, electronic communications and social media campaigns (Facebook posts, Twitter, Instagram) to correct misperceptions related to drinking on campus with the goal of normalizing reduced rates of alcohol consumption in general and of binge drinking in particular (Broadwater et al., 2006; Newton, 2015). A five-year study of a social norms campaign conducted at a public university campus of 23,000 students reported an 18.5% drop in number of students who perceived binge drinking as the norm around them (from 69.7% to 51.2%) and an 8.8% reduction in binge-drinking overall (from 43.0% to 34.2%) (Haines & Spear, 1996).

While these numbers seem encouraging, some researchers have criticized the validity of studies reporting success with social norms. First, these studies have been criticized because the studies were not randomized and the campuses studied may have adopted other alcohol reduction approaches at the same time that were not controlled for. In addition, there is no real evidence to suggest a drop in national binge drinking levels on college campuses despite the broad adoption of social norms intervention strategies (Pilling & Brannon, 2007).

Another approach that some university administrators have implemented in recent years, the personalized behavioral feedback approach, asks individual students about their own (as opposed to their peers') behaviors and core values, and then targets messages tailored to those responses (Newton, 2015; Pilling & Brannon,

2007). The theory behind this approach is that tailored messages are remembered more easily, are considered more relevant, and are more likely to achieve compliance on health-related matters (Murray-Johnson & Witte, 2003). To provide a concrete example of how this might work, a student whose responses to the initial questions about their values and behavior suggest s/he has an adventurous personality might receive an anti-binge drinking message that stresses the excitement of drinking responsibly by pointing out that alcohol is a depressant, and that when it is consumed in large quantities, it dulls the senses and curtails adventure (Pilling & Brannon, 2007). While individual students who receive personalized messages to drink responsibly report more favorable attitudes towards the message, there is no definitive evidence that this translates into changes in behavior or a significant reduction in campus binge drinking rates.

Other prevention and intervention approaches that universities have turned to in order to combat binge drinking include student-to-student mentoring, changing environmental factors that promote a binge-drinking campus culture, and interventions designed specifically for high-risk groups (Newton, 215). This last approach, which builds on the personalized behavior feedback approach, has seen some promising results. For example, a 2015 study examining the effects of a single-session motivational interview-based in-person intervention specifically designed for student-athletes meeting criteria for heavy episodic drinking found that those who participated in the intervention showed significant reductions both in alcohol use and in alcohol-related negative consequences three months post-intervention compared to a control group (Cimini, Monserrat, Sokolowski, Dewitt-Parker, Rivero, & McElroy,

2015) Another targeted intervention study, from 2017, examined the role of athletic head coaches' attitudes and behaviors towards student-athletes' heavy episodic drinking and found that higher concerned communication and lower conditional leniency on the part of head coaches were associated with less alcohol use by team players (Pitts, Chow, & Yang, 2017). In other words, the more their coach communicated with them concerning the dangers and risks of alcohol use, the less the players engaged in binge drinking behaviors; conversely, the more lenient the coach was about alcohol abuse, the more the players engaged in binge drinking.

While these targeted intervention programs specifically designed for high-risk groups, such as student-athletes, show some promise, on the whole colleges and universities have been stymied in their attempts to reduce the prevalence and the negative consequence of binge drinking on campus. A better understanding of the prevalence of binge drinking, the demographic groups particularly at-risk for it, and the motivations, expectancies and consequences associated with binge drinking is crucial to designing and implementing more successful intervention campaigns and hopefully reducing the rate of binge drinking on campuses.

Purpose and Hypotheses

The purpose of this study is to further investigate binge drinking among college students. The aim of this study is to identify the prevalence of binge drinking at Wesleyan University overall and more specifically among and between specific groups. In addition, this study will look at the effects of and the motives behind binge drinking. Finally, this study will analyze the influence of various demographic factors including gender, socioeconomic status, and athletic participation on the prevalence,

motives, and consequences of binge drinking. This study will contribute to the existing literature insofar as it will help to provide a better understanding of the existence of binge drinking and alcohol abuse patterns that happen on small liberal arts college campuses. With this information, the study might shed light on potentially effective means of addressing these consequential behaviors, motivations, and expectancies, an area which presently has not yielded great success.

Based on the review of the literature, I hypothesize the following:

Prevalence of binge drinking. The overall prevalence of binge drinking in this sample of Wesleyan University students is expected to align with results from prior research of other college students in the United States at around 40% of the population. When looking more specifically at how gender, socioeconomic status, and athletic participation influence the prevalence of binge drinking the following results are expected to be seen. First, it is expected that more males will engage in binge drinking than females. Second, it is expected that individuals from higher socioeconomic backgrounds will engage in more binge drinking than those from lower socioeconomic backgrounds. Finally, it is hypothesized that those who participate in athletics will engage in more binge drinking than non-athletes.

Motives. It is expected that enhancement, social, and coping motivations will be higher for binge-drinkers compare to non-binge drinkers. In addition, it is expected that enhancement motivations will be highest among binge drinkers, followed by social, coping, and lastly, conformity motivations. These motivations can be further analyzed by subgroup. It is expected that binge-drinking motivations will differ according to gender; males are expected to report higher enhancement and social

motivations and females are expected to report higher conformity motivations. It is also hypothesized that socioeconomic status will yield an effect on binge-drinking motivations. It is anticipated that those from higher socioeconomic backgrounds will report higher social reasons while those from lower socioeconomic backgrounds will report higher coping motivations. Finally, athletic participation is expected to create differences in binge drinking motivations. It is expected that athletes will report higher social and conformity motivations for drinking than non-athletes.

In addition to motivations, expectancies are anticipated to differ. Positive and arousing alcohol expectancies are predicted to be higher for binge drinking participants compared to non-binge drinkers. In addition, it is expected that these motivations will be highest among binge drinkers, with both sedating and negative expectancies being lower. Again, this can be further broken down by sub-group. Males and females, alike, are predicted to report similar alcohol expectancies. In terms of socioeconomic status, those from higher socioeconomic backgrounds are hypothesized to report higher positive expectancies and those from lower socioeconomic backgrounds are hypothesized to report higher negative expectancies. Lastly, athletic participation is not expected to have an effect on the alcohol expectancies of participants.

Consequences. It is expected that binge drinkers will report higher negative consequences than non-binge drinkers. Again, gender, socioeconomic status, and athletic participation will also be analyzed with regard to negative consequences for binge-drinking. Gender is not expected to yield any significant differences in results for negative consequences (i.e., males and females are expected to report having

similar levels of negative consequences of binge-drinking). Individuals from lower socioeconomic backgrounds are expected to report more negative consequences than those from higher socioeconomic backgrounds. Lastly, athletic participation is hypothesized to influence the results such that athletes will report more negative consequences of binge drinking than non-athletes.

Methods

Participants

This study consisted of 62 undergraduate students at Wesleyan University, a small liberal arts college located in Middletown, CT. Participants were enrolled in Foundations of Contemporary Psychology (PSYC 105) and received research credit for participation. The majority, 72.6%, were in their first year with another 14.5% sophomores, 8.1% juniors, and 4.8% seniors. In terms of gender, 64.5% were male and 35.5% were female. In terms of race/ethnicity, most participants identified as white (43.5%) and the remainder were as follows: 27.4% Asian/Pacific Islander, 12.8% Black/African American, 11.3% Hispanic/Latino, and 4.8% Other. With regard to socioeconomic status, this was defined as receiving financial aid (lower socioeconomic status) or not receiving financial aid for education (higher socioeconomic status). Of the participants, 61.3% were defined as being of higher socioeconomic status and 38.7% as being of lower socioeconomic status. For athletic participation, 32.3% of the participants said that they currently participated in a varsity sport and 37.1% said that they had participated in a varsity sport at Wesleyan at some time.

Procedure

Prior to this survey being administered to any students, it was reviewed and approved by the Institutional Review Board at Wesleyan University. The study was administered online via the Qualtrics platform and could be completed on personal laptops or electronic devices from any location. Prior to starting the survey, participants read and signed an electronic consent form. This form acknowledged that

they could discontinue with the study at any time should they feel that it was necessary. The survey started with a general demographic questionnaire asking participants about their class year, gender, ethnicity, socioeconomic status (i.e., whether they qualified for financial aid), and athletic participation (i.e., whether or not they currently participated or had participated in a Varsity sport). Participants then completed a series of questionnaires assessing drinking behavior, motivations, expectancies, and negative consequences.

After completion of the entire survey, an electronic debriefing form was presented to the participants. This form included contact information for the researchers for further questions or comments. Additionally, it discussed the purpose of the study, details regarding where further information on the subject matter could be found, and contact information of resources for anyone experiencing any distress as a result of this study.

Materials

Drinking behaviors. Drinking behaviors were assessed with the Drinking Behaviors Questionnaire-Revised (DBQ; Cahalan & Room, 1972). This questionnaire includes 11 items related to type of alcohol consumed, frequency, quantity, duration, intoxication, and tolerance. For the purposes of this study, only one item was used in order to establish quantity of alcohol consumption (“On the average, how often do you consume alcoholic beverages of any kind?”). This item was then used to categorize participants into “binge drinking” and “no binge drinking” categories according to the 5/4 threshold (Wechsler, 2001). Men that reported consuming five

drinks or more and women that reported consuming four drinks or more were considered to fall into the “binge drinking” category.

Motives. Motives for drinking were assessed with two questionnaires. The Drinking Motives Questionnaire-Revised (DMQ; Cooper, 1994) was used to assess specific motivations for drinking. The DMQ includes 20 items rated on a 5-point Likert scale from “almost never/never” to “almost always/always”. The DMQ consists of four subscales: Social (e.g., “to be sociable”), Coping (e.g., “to forget about your problems”), Enhancement (“because you feel more self-confident”), and Conformity (“to fit in with a group you like”).

The Alcohol Expectancy Inventory (AEI; Rather, Goldman, Roehrich, & Brannick, 1992) was used to assess expectancies (i.e., how participants expect feel when intoxicated). The AEI consists of 24 items rated on a 7-point Likert scale from “never” to “always”. The AEI can be broken down into four subscales: Positive (e.g., “beautiful”), Negative (e.g., “deadly”), Aroused (e.g., “outgoing”), and Sedative (e.g., “drowsy”).

Consequences. Consequences for drinking were measured using the Young Adult Alcohol Problems Screening Test (YAP; Hurlbut, & Sher, 1992). The YAP includes 27 items and is designed to assess alcohol related consequences. Respondents are first asked to indicate if a consequence has “never” occurred, has occurred “but not in the past year”, or, if it has occurred in the past year, to indicate how frequently. Options for frequency of consequences occurring within the past year range from “one time” to “40 or more times”. This measure encompassed a variety of physical, social, occupational/school, and legal troubles. Higher scores on this

measure indicate greater frequency of negative consequences associated with drinking behavior.

RESULTS

Data management

All statistical analyses performed for this study were done using IBM SPSS Statistics 24. A missing data analysis was conducted, revealing that there were several participants with missing data, who skipped items from the DMQ (five items with missing data) and AEI (nine items with missing data). However, there were only between one and two data points missing for each item on the DMQ and AEI. Thus, missing data points were minimal and there were no questionnaires with large amounts of missing data. Missing data was replaced with regression imputation. In addition, the data were evaluated for significant outliers. There were no significant outliers on any of the measures, thus the entire sample was retained for analysis.

Descriptive Statistics, Reliabilities, and Correlations

First, descriptive statistics were calculated for the entire sample. Means and standard deviations demonstrate a range of responses on each measure and are shown in Table 1.

Reliabilities were calculated for all of the measures used, and all measures met standards for adequate reliability (see Table 1).

Correlations were also calculated between each of the measures and are shown in Table 2. All of the motives were significantly positively correlated with one another with the exception of enhancement and conformity. All of the expectancies were also significantly positively correlated with one another. All of the motives were significantly positively correlated with all of the expectancies. Negative consequences

were strongly positively correlated with social and enhancement motives. Negative consequences were also strongly positively correlated with all of the expectancies.

Prevalence and Frequencies

To test the first hypothesis, that the overall prevalence of binge drinking in our sample would be comparable to prior studies using collegiate populations (i.e., 40%), we conducted a chi-square goodness-of-fit test. The results showed that there was no significant difference between the expected prevalence and the observed prevalence in our sample, $\chi^2(1, n = 62) = .10, p = .76$.

To test our hypotheses regarding differences in rates of binge drinking by gender, socioeconomic status, and athletic participation, a series of chi-square tests of independence were conducted. For gender, there was no significant difference between males and females in proportion of binge drinkers, $\chi^2(1, n = 62) = .02, p = .90$. Binge drinking also did not differ by socioeconomic status, $\chi^2(1, n = 62) = .001, p = .97$. For current athletic participation, there was a significant difference in that 70% of current athletes report binge drinking compared to only 29% of non-athletes who report binge drinking, $\chi^2(1, n = 62) = 9.55, p = .002$. For athletic participation at any time during participants' college career, there was also a significant difference in that 65% of current or former student-athletes report binge drinking and only 28% of non-athletes (students who have never participated in collegiate athletics) report binge drinking, $\chi^2(1, n = 62) = 8.14, p = .004$.

Motivations

To test the hypothesis that certain motivations (i.e., social, enhancement, and coping) would be higher for binge-drinkers compared to non-binge drinkers, a series

of independent-samples t-tests were conducted. For social motives, results did show significant differences between binge drinkers and non-binge drinkers, $t(60) = -4.68$, $p < .01$. Binge drinkers ($M = 18.32$, $SD = 3.82$) reported more social motives for drinking than non-binge drinkers ($M = 12.30$, $SD = 5.70$). In addition, for enhancement motives, results showed significant differences between binge drinkers and non-binge drinkers, $t(60) = -2.51$, $p = .02$. Binge drinkers ($M = 15.92$, $SD = 4.58$) reported more enhancement motives for drinking than non-binge drinkers ($M = 12.17$, $SD = 6.55$). Coping motives also showed significant differences between binge drinkers and non-binge drinkers, $t(60) = -1.96$, $p < .01$. Binge drinkers ($M = 9.54$, $SD = 3.42$) reported more coping motives for drinking than non-binge drinkers ($M = 7.75$, $SD = 3.64$). Finally, conformity motives showed no significant differences between binge drinkers and non-binge drinkers, $t(60) = -1.44$, $p = .16$.

To test our hypothesis regarding which motivations would be highest for binge-drinkers, a one-way MANOVA was conducted. The results showed that there were significant differences among the motivations, Wilk's $\lambda = 0.13$, $F(3, 23) = 51.56$, $p < .01$. For binge drinkers, motivations were all significantly different ($p < .05$) such that social ($M = 18.32$, $SD = 3.82$) was the highest, followed by enhancement ($M = 15.92$, $SD = 4.58$), then coping ($M = 9.54$, $SD = 3.42$), and finally conformity ($M = 7.46$, $SD = 2.67$) (see Figure 3).

To test our hypotheses regarding how motivations varied according to gender, socioeconomic status, and athletic participation, a series of two-way ANOVAs were conducted. There was a main effect for gender on conformity motives, $F(1, 61) = 5.37$, $p = .02$. Females scored higher ($M = 7.76$, $SD = 2.82$) than males ($M = 6.45$, SD

= 2.33) for conformity motives. There was also a significant interaction between socioeconomic status and binge drinking for social motives, $F(1, 61) = 6.12, p = .02$ (see Figure 1). The interaction showed that there was no difference in social motives for those who binge drink; for those from lower socioeconomic backgrounds the mean was 18.90 ($SD = 3.76$) and those from higher socioeconomic backgrounds had a mean of 17.95 ($SD = 3.94$). There was a difference for those who don't binge drink, such that those from higher socioeconomic backgrounds reported higher social motives ($M = 14.30, SD = 5.79$) than those from lower socioeconomic backgrounds ($M = 9.14, SD = 3.94$). There were no other significant differences.

Expectancies

To test the hypothesis that certain motivations (i.e., positive and arousing) would be higher for binge-drinkers compared to non-binge drinkers, a series of independent-samples t-tests were conducted. For positive expectancies, results showed significant differences between binge drinkers and non-binge drinkers, $t(60) = -3.95, p < .01$. Binge drinkers ($M = 30.50, SD = 7.36$) reported more positive expectancies of drinking than non-binge drinkers ($M = 21.05, SD = 10.46$). For arousal expectancies, results showed significant differences between binge drinkers and non-binge drinkers, $t(60) = -3.17, p = .01$. Binge drinkers ($M = 29.38, SD = 9.37$) reported more arousal expectancies of drinking than non-binge drinkers ($M = 20.46, SD = 11.92$). In addition, negative expectancies were significantly different between binge drinkers and non-binge drinkers, $t(60) = -2.12, p = .03$. Binge drinkers ($M = 21.29, SD = 6.75$) reported more negative expectancies of drinking than non-binge drinkers ($M = 16.83, SD = 8.51$). Finally, for sedative expectancies, results also

showed significant differences between binge drinkers and non-binge drinkers, $t(60) = -2.52, p = .01$. Binge drinkers ($M = 27.44, SD = 9.37$) reported more sedative expectancies of drinking than non-binge drinkers ($M = 21.07, SD = 10.13$).

To test our hypotheses regarding how alcohol expectancies varied according to gender, socioeconomic status, and athletic participation, a series of two-way ANOVAs were conducted. There was a main effect for socioeconomic status and positive alcohol expectancies, $F(1, 61) = 4.56, p = .04$. Individuals from higher socioeconomic backgrounds had higher positive alcohol expectancies ($M = 27.25, SD = 9.14$) than those from lower socioeconomic backgrounds ($M = 21.47, SD = 11.33$). There was also an interaction between socioeconomic status and binge drinking for positive alcohol expectancies, $F(1, 61) = 5.86, p = .02$ (see Figure 2). There was no difference in positive alcohol expectancies for binge drinkers by socioeconomic status; for those from higher socioeconomic backgrounds the mean was 30.25 ($SD = 7.91$) and for those from lower socioeconomic backgrounds the mean was 30.90 ($SD = 6.77$). For non-binge drinkers, those from higher socioeconomic backgrounds reported higher positive expectancies; for higher socioeconomic status the mean was 25.07 ($SD = 9.52$) and for lower socioeconomic status the mean was 14.74 ($SD = 8.83$). There was also a main effect for socioeconomic status and negative alcohol expectancies, $F(1, 61) = 9.61, p < .01$. Those from lower socioeconomic backgrounds reported lower negative alcohol expectancies ($M = 14.89, SD = 7.05$) than those from higher socioeconomic backgrounds ($M = 21.10, SD = 7.82$). There was another main effect for socioeconomic status and arousal alcohol expectancies, $F(1, 61) = 4.319, p = .04$.

Those from lower socioeconomic backgrounds reported lower arousal alcohol expectancies ($M = 20.24$, $SD = 10.69$) than those from higher socioeconomic backgrounds ($M = 26.71$, $SD = 11.77$)

To test our hypothesis that positive and arousing expectancies would be highest for binge-drinkers, a one-way MANOVA was conducted. The results showed that there were significant differences among the expectancies, Wilk's $\lambda = 0.35$, $F(3, 23) = 14.11$, $p < .01$. For binge drinkers, expectancies are significantly different such that negative expectancies ($M = 21.29$, $SD = 6.75$) are lower ($p < .01$) than positive ($M = 30.50$, $SD = 7.36$), arousal ($M = 29.38$, $SD = 9.37$), and sedative ($M = 27.44$, $SD = 9.37$), but there are no significant differences among these three (see Figure 4).

Negative Consequences

To test the hypothesis that binge drinking would be associated with more negative consequences, an independent samples t-test was conducted comparing binge drinkers to non-binge drinkers. The results revealed a significant difference in negative consequences between binge drinkers and non-binge drinkers, $t(59) = -3.16$, $p < .01$. Binge drinkers reported more negative consequences ($M = 6.56$, $SD = 3.60$) of drinking than non-binge drinkers ($M = 3.37$, $SD = 4.09$).

To test our hypotheses regarding how negative consequences varied according to gender, socioeconomic status, and athletic participation, a series of two-way ANOVAs were conducted. There was a main effect for socioeconomic status and negative consequences, $F(1, 61) = 13.92$, $p < .01$. This results is such that those from higher socioeconomic backgrounds reported more negative consequences ($M = 5.97$, $SD = 4.25$) than those from lower socioeconomic backgrounds ($M = 2.69$, $SD = 3.18$).

There was a main effect for athletic participation, $F(1, 61) = 5.56, p = .02$. This is such that those who have ever participated in a Varsity sport at Wesleyan reported more negative consequences ($M = 6.82, SD = 4.21$) of binge drinking than those who have never participated in a Varsity sport at Wesleyan ($M = 3.47, SD = 3.65$).

DISCUSSION

Prevalence

The results from this research study supported the first hypothesis about the prevalence of binge drinking on Wesleyan University's campus. The hypothesis predicted that the prevalence of binge drinking would align with prior studies so that approximately 40% of participating students would be binge drinkers. The percentage of binge-drinkers in our samples was 41.94%, thus approximating prior studies. This finding is not surprising since a large scale study of 17,592 students from 140 different college campuses found that 44% participated in binge drinking behavior (Weschler et al., 1994, 1998, 2000; NIAAA, 2002).

The next hypothesis, which predicted that there would be a higher male prevalence of binge drinking than female, was not supported by the results. The results showed that in our sample, the prevalence of binge drinking was not significantly different between males and females. One potential explanation for this finding comes from recent studies examining gender and alcohol consumption. These studies have proposed that gender differences that have historically existed for drinking might be decreasing as a result of other changes in the roles of women or a reduction in male drinking (Wilsnack, 2009). While the majority of binge drinking studies report that the gender gap between male and female drinkers remains in place, more recent studies are beginning to see a closing of this gap, as females are drinking more (Dir et al., 2017; Nolen-Hoeksema 2004; Wilsnack et al, 2009; Witbrodt, 2014). A 2009 study examining gender and alcohol consumption proposed that perhaps gender differences that have traditionally existed for drinking are decreasing as a

result of other changes in the roles of women or a reduction in male drinking. (Wilsnack, et al., 2009). The closing of the binge drinking gender gap is particularly so for adolescents; a 2017 study points to a dramatic narrowing of the gender gap and a steady climb in binge drinking rates among adolescent girls (Dir et al., 2017).

Another potential explanation for the lack of gender difference in the present study might be due to the fact that the majority of the participant pool was constituted by first year students at Wesleyan. Thus, the result that appears to show no difference between male and female binge drinking prevalence overall, might actually be more representative of mainly first year males and females. As was previously stated, binge drinking is highest among first-year college students; thus, gender differences may not be as apparent at this age.

The next hypothesis predicted that individuals from higher socioeconomic backgrounds individuals would be more likely to engage in binge drinking than those from lower socioeconomic status backgrounds. The data collected contradicted this hypothesis and yielded that, in fact, socioeconomic status did not have a significant effect on the prevalence of binge drinking. This might be due to the way socioeconomic status was defined in the present study (i.e., whether or not the student was receiving financial aid for education). A more inclusive measure of the various factors involved in socioeconomic status (e.g., income, parental education) might fit better with prior research that has indicated higher socioeconomic status is associated with binge drinking (CDC, 2012; Collins, 2016). Still another consideration is that, at least insofar as the prevalence of binge drinking is concerned, the college

environment in itself might suspend the differences between high and low socio-economic status and serve, in some sense, as an equalizing force.

The results supported the hypothesis that those participating in athletics would have higher rates of binge drinking than non-athletes. The significant difference between athletes and non-athletes in binge drinking prevalence is unsurprising as prior research has shown that athletes drank significantly more in general and engaged in more binge drinking than non-athletes (Dietz, 2008; Green, Nelson, & Hartmann, 2014; Nelson & Wechsler, 2001; Newton, 2015; Turrisi et al, 2006). The high prevalence of binge drinking among college athletes suggests that intervention programs specifically designed for them can not only help reduce drinking in the target group, but, insofar as athletes often serve as leaders in setting campus norms, can also help change the binge drinking culture on campuses.

Motivations

When considering the motivations behind binge drinking, it was expected that binge drinkers would report higher enhancement, social, and coping based motivations than non-binge drinkers. This hypothesis was supported by the results in that binge drinkers did in fact report higher motivations for drinking for all three of these categories. Across the first three of these, the higher rate of motives reported by binge-drinking students when compared to their non-binge drinking classmates may be due to the fact that students who binge drink tend to feel more motivated to drink in general than do non-binge drinkers and, as a result, report motives for doing so.

Among the binge drinking participants, the hypothesis was also partially supported in that conformity motivations were lowest with coping as the second

lowest. However, social motivations were higher than enhancement motivations, which contradicts our hypothesis and prior research findings.

As expected, conformity motivations did not differ by binge drinking status and conformity motives were the lowest overall reported motivation for binge drinking. These findings make sense given the approximate age of the sample was 18-24 years and social pressures of conformity have a stronger influence on adolescents younger than those sampled. In a research study that assessed the strength of peer influence for pro-alcohol and anti-alcohol norms it was found that for adolescents, peer influence is, in fact, one of the strongest predictors of alcohol use (Teunissen, 2013).

The results partially supported the hypothesis regarding gender and motivations for drinking in that females did in fact report higher for conformity motivations. This aligns with research conducted finding higher conformity motivations among women with social anxiety (Lewis, 2008). It is possible that similar social anxieties existed within the women of the participant pool of the current study such that the results aligned in this way. The results are also consistent with studies on gender and conformity more broadly, which point to the role of gender in the tendency for women to conform more than men in pressure group situations (Eagly and Chivala, 1986).

The second half of this hypothesis was not supported, males did not have higher reports of social and enhancement motivations for binge drinking. The results showed that there was not a significant difference between the two genders. Prior research of gender-based differences in alcohol consumption motivations among

college-aged students supported the hypothesis that males would have higher social and enhancement motives for binge-drinking (Samoluk and Stewart, 1998; Gire, 2002; Kuntsche et al, 2005). Here again, the presumed young age of the participants might have been a factor, since motives tend to differentiate more along demographic lines such as gender as individuals become older and move from adolescence to adulthood. Another possibility is that the same type of social change that accounts for the narrowing gender gap in binge drinking rates that this study captured may be at work, and that female college students are not only increasingly drinking as much as their male student counterparts but for more of the same motivations.

It was predicted that binge drinkers from higher socioeconomic backgrounds would report higher social motivations for drinking while those from lower socioeconomic backgrounds would report higher coping motivations. This hypothesis was partially supported by the study. Those from higher socioeconomic backgrounds did report higher social motivations for drinking; however, this was only true for non-binge drinkers. This finding might also be attributed to the narrow definition of socioeconomic status used for this study. Thus, the individuals considered to be from low socioeconomic backgrounds in this study might be different from those considered to be from low socioeconomic backgrounds in prior research. Also, because all of the participants of the present study are attending Wesleyan University, they might be protected from the more influential aspects of their socioeconomic status.

There were no significant differences in motivations among binge drinkers according to their athletic participation. This was counter to the hypothesis that binge

drinkers involved in collegiate athletics would differ from non-athletes in that they would report more social and conformity motivations for binge drinking. The hypothesis was based in part on the external, social facing dimension of both social and conformity motivations (Cooper, 1994); it was assumed that because many athletes consume alcohol alongside their teammates, the sense of team belonging would make externally generated motivations greater than internally generated ones. The results do not suggest that social motives are unimportant for athletes who binge drink (on the contrary, social motives were at the top for binge drinkers across the board), but rather that they are no less important for non-athletes who also binge drink.

Expectancies

The data supported the hypothesis that binge drinkers would report higher positive and arousal expectancies than non-binge drinkers. This result aligns with information collected in a prior study that reported that all people who drink (both binge drinkers and non-binge drinkers) associate positive and prosocial expectancies with alcohol consumption (Neighbors, 2007; Rather et al., 1992). The fact that students who binge drink had higher positive expectancies than students who don't supports the idea that expectancy has a causal relation to alcohol consumption; while other factors must also be taken into consideration, one might suppose from this that the more positive the expectancy, the more likely the individual is to drink excessive quantities. The results also showed, however, that binge drinkers reported higher negative and sedative expectancies of drinking. This might be a result of the greater motives binge drinkers seem to have to drink more generally, than non-binge

drinkers. Given the way binge drinking status was defined in this study (i.e., using the 5/4 threshold), perhaps what was really being classified were drinkers vs. non-drinkers as opposed to specifically binge drinkers and non-binge drinkers. As this might be the case, people who do drink would likely have higher reports of all four expectancies compared to those who don't drink. As hypothesized, for binge drinkers overall, negative expectancies were lower than positive, arousal, and sedative expectancies. This makes sense because binge drinkers are less likely to associate negative expectancies with drinking.

Results supported the hypothesis which predicted no significant difference in expectancies by binge-drinker gender. This is largely supported by the literature, even though some studies suggest that gender can moderate the apparently causal relation between expectancy and consumption (Neighbors, 2007). This might also be related to the narrowing of the gender gap in the prevalence of binge drinking and, consequently, of the expectancies that contribute to it.

The data partially supported the hypothesis that predicted that students from higher socioeconomic status would have more positive alcohol expectancies than those from lower socioeconomic statuses. While the relation between high economic status and positive expectancies was true overall, the hypothesis was borne out among non-binge drinking students: students with higher socio-economic status who did not engage in binge drinking reported higher positive expectancies than non-binge drinking students with lower socio-economic status. In the case of binge drinkers, however, socio-economic status was not a factor in determining the degree of positive expectancies. Although it was not hypothesized, the data further showed that students

with higher socioeconomic statuses also reported higher negative and arousal alcohol expectancies than those with lower socioeconomic statuses. These findings suggest that students from higher socio-economic statuses have a stronger sense that alcohol will result in positive (social), negative (antisocial) and arousal outcomes than students from lower socio-economic statuses. Insofar as higher socio-economic status has also been linked to greater prevalence of binge drinking, the data might be said to mostly support the literature that indicates a positive correlation between expectancies and alcohol consumption (Henderson, Goldman, Coover and Carnevalla, 1994). But since lower socio-economic status has been linked to greater frequency and quantity of binge drinking, it may be that lower level of expectancies contributes to more, more often (CDC, 2012). It would also be interesting to consider these findings alongside binge drinking patterns according to socio economic status on one hand and, on the other, studies noting that alcohol consumption causes more harm to drinkers of lower socio-economic status than to those in higher socio-economic status, and to explore if having different levels of expectancies might be a factor in this (Hall, 2017).

The hypothesis that there would be no significant difference in alcohol expectancies by athletic participation was supported by the results. Athletes who engage in binge drinking have the same expectancies as non-athletes who engage in binge drinking, and athletes who do not engage in binge-drinking have the same expectancies as non-athletes who do not engage in binge drinking. These findings suggest that although athletic participation was an important determinant in binge drinking prevalence, it does not seem to be related to expectancies. The implication is

that something else must account for the higher rate and frequency of binge drinking among college athletes.

Consequences

The results supported the hypothesis that binge drinkers report higher negative consequences of excessive drinking. This aligns with the literature which suggests that binge drinkers have a higher likelihood of experiencing the negative consequences of alcohol consumption than non-binge drinkers (Hingson, Zha, and White, 2017; Newton, 2015). It might also be used as a cautionary tale for campus alcohol prevention and intervention programs.

Data supported the hypothesis which predicted no significant difference in negative consequences by gender. While this contradicts a body of studies suggesting that women suffer greater negative alcohol-related consequences than men, it conforms with more recent studies that question this, suggesting instead that the negative consequences experienced by male and female students on college campuses are roughly comparable. This finding also represents another area in which the gender gap on binge drinking seems to be narrowing.

The data did not support the prediction that those from lower socioeconomic backgrounds would experience more negative consequences than those from higher socioeconomic backgrounds. This contradictory finding might be due to the nature of belonging to a higher socioeconomic group. These individuals likely have more of a means of dealing with the negative consequences so that their lives are not greatly tolled. Individuals from lower socioeconomic backgrounds might not have the necessary means available so that the negative consequences can be easily rectified;

as a result, they may need to be cautious with regard to their drinking and effects on behavior.

Finally, the prediction that athletes would experience more negative consequences than non-athletes was supported by the results. This may be due to the special no alcohol rules that most collegiate athletic teams enforce, which add an additional set of severe negative consequences for athletes in comparison to their non-athlete peers. These consequences may include, but are not limited to: punitive team or individual practice sessions (extra laps or sprints), suspension from a team, forfeiture of games, lost athletic scholarships, cancellation of a team's entire season, etc.

Strengths

This study had several strengths including the relative diversity of the sample, the inclusion of demographic variables, and the administration format of the survey. The sample of students was relatively diverse across a range of demographic variables. For example, males and females were more or less equally represented in this survey. The same goes for students from higher and lower socioeconomic backgrounds and for athletes and non-athletes. Respondents' ethnicity was also relatively diverse. This bolsters the study's generalizability, and presents more widely applicable insight into binge drinking relative to studies that might have lacked the same kinds of diversity.

Other strengths can be found within the design of the study itself. This study specifically included the demographic variables mentioned earlier. Not only did the diversity of the sample strengthen the generalizability, it also strengthened the

research by creating opportunities to study whether or not those demographic factors had impacts on prevalence, motivations, expectancies, and consequences of drinking, rather than simply offering insight at a binary binge drinker vs. non-binge drinker level.

Finally, the structure of the survey also had strengths. First, the survey was easily accessible, and not overly demanding or difficult to navigate. This helped ensure that as large a number of students that were asked to take the study would actually participate. This ease and accessibility prevented unintentional bias from self-selection that might have occurred based on differing commitment levels should the study have required participants to physically go to a certain location as opposed to taking it on their personal laptops. Were the survey more difficult to access and complete, the participants might have skewed towards more motivated students, which in turn could have biased the survey as a whole. In addition, the anonymous nature of the survey allowed for honest answers in a way that a non-anonymous survey might have prevented. Particularly in a survey in which potentially illegal behaviors are mentioned (e.g., underage drinking, driving under the influence of alcohol, etc.) anonymous responses ensured that any fear of being identified and facing further consequences for any behaviors or actions would be minimized.

Weaknesses

Despite several strengths of this study, there are also limitations in terms of the sample, the design, and the procedure. First, although the participant pool was relatively diverse, it was still very small as a whole, and therefore limited in its generalizability. It also was limited to students enrolled in Foundations of

Contemporary Psychology at the time of survey, which might have introduced an unintentional bias, if for some reason students who are interested in or passionate about psychology are not representative of the greater population of college students.

Further, the manner in which demographic factors were measured and collected could be expanded and clarified, to allow for a higher degree of insight. For example, it would be helpful to be able to examine whether or not certain sports teams are more associated with higher levels of binge drinking, or with different motivations, expectancies and consequences. Given the size of the participant pool, the sample sizes were realistically too small to be able to make those distinctions within some of the demographic factors. Additionally, some of the definitions used in collecting demographics were limiting. Socioeconomic status was one particularly difficult to fully capture. Simplifying one's socioeconomic status into whether or not that student receives financial aid can misidentify students that find themselves in unique financial situations that blur the distinction between high and low socioeconomic status. It is possible that by expanding the definitions of high and low socioeconomic status, a fuller and more complete understanding of socioeconomic factors, motivations, and consequences can be gained. Again, given the participant pool with which the survey dealt, sample size might have limited such an undertaking if it were to occur in the survey at hand.

Another measurement that could have been fleshed out further was the definition of binge drinking itself. As far as the analyses in this study are concerned, drinking was treated as a dichotomous variable; a student either engaged in binge drinking or did not. However, it is possible, even likely, that binge drinking exists as

a continuum rather than as a binary behavior. In combination with deeper demographic factors, measuring responses across a spectrum rather than across a dividing line could provide very deep levels of insight. One sports team might compare with another at face value in terms of whether or not a student is likely to engage in binge drinking as currently defined, but those two sports teams might engage in very different drinking behaviors, to the extent that participants belonging to one team might engage in binge drinking to twice the extent that participants belonging to another.

Finally, the self-report format of the study leaves room for improvement. With self-report questionnaires, individuals can be dishonest or inaccurate in their reports. Given the anonymous nature of the survey, we hope that this concern was minimized. In addition, this study focuses on self-reported behaviors, motives, and consequences, but does not measure actual behavior or attitudes in the period surrounding binge drinking. Examining the periods of active binge drinking could provide significant additional insight into motivations, factors, and consequences of binge drinking, during binge drinking.

Future Direction

Given the valuable insights gained from this study, as well as the areas in which there are clear opportunities to improve upon the current methodology and scope, there are many ways to continue research into binge drinking among college students and different demographic factors. These future directions, ranging from different survey strategies to educational opportunities, all build off both the positives and shortcomings of this study.

First, the areas of opportunity for improvement offer a clear path to a stronger, more generalizable study. Steps taken in future studies could include a larger sample size, and one consisting of an even more diverse population. On top of providing more generalizability, it would also allow for more specific demographic information to be collected, and further insight into sub-demographics within the more general demographic groups, such as specific sports teams, or varying levels of socioeconomic status. Having observed significant differences between the demographic segments within this study, breaking those segments up further could provide a considerable amount of useful and meaningful data. Additionally, defining binge drinking behavior into a scale or spectrum, rather than a binary indicator, could help differentiate different drinking behaviors from the two current binge drinking categories. This would allow for far more nuanced findings, and minimize miscategorization or misrepresentation of respondents.

Finally, the insight gained from this study points to a disconnect between expectancies and motives and actual consequences among students who engage in binge drinking behaviors. Specifically, binge drinking students have generally positive motivations and expectancies regarding binge-drinking, but were shown to suffer significant negative consequences as a result of their binge drinking. This disconnect represents an opportunity to engage with students who participate in binge drinking behaviors, in order to better understand the cause for the dichotomy, and use the results of the study to help bridge the gap between the positive expectancies that binge drinkers and negative consequences that those same binge drinkers experience.

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TABLES AND FIGURES

Table 1. *Descriptives and Reliability for Measures in Sample*

	<i>M</i>	<i>SD</i>	α
1. DMQ-Social	14.82	5.79	.91
2. DMQ-Coping	8.50	3.62	.77
3. DMQ-Enhancement	13.74	6.05	.91
4. DMQ-Conformity	6.92	2.57	.78
5. AEI-Positive	25.01	10.35	.88
6. AEI-Negative	18.70	8.07	.87
7. AEI-Arousal	24.20	11.71	.91
8. AEI-Sedative	23.74	10.24	.92
9. YAP	4.73	4.17	.85

Notes. $N = 62$. DMQ = Drinking Motives Questionnaire; AEI = Alcohol Expectancy Inventory; YAP = Young Adult Alcohol Problem Screening Test.

Table 2. *Correlations for Measures in Sample*

	2.	3.	4.	5.	6.	7.	8.	9.
1. DMQ-Social	.50**	.81**	.40**	.72**	.56**	.71**	.51**	.41**
2. DMQ-Coping	-----	.48**	.39**	.55**	.40**	.523**	.44**	.13
3. DMQ-Enhancement	-----	-----	.23	.66**	.53**	.67**	.43**	.46**
4. DMQ-Conformity	-----	.-----	-----	.39**	.53**	.36**	.45**	.102
5. AEI-Positive	-----	-----	-----	-----	.691**	.82**	.79**	.46**
6. AEI-Negative	-----	-----	-----	-----	-----	.75**	.72**	.51**
7. AEI-Arousal	-----	-----	-----	-----	-----	-----	.53**	.43**
8. AEI-Sedative	-----	-----	-----	-----	-----	-----	-----	.36**

Notes. $N = 62$. DMQ = Drinking Motives Questionnaire; AEI = Alcohol Expectancy Inventory; YAP = Young Adult Alcohol Problem Screening Test.

Figure 1. Interaction between Binge-Drinking and SES for Social Motives.

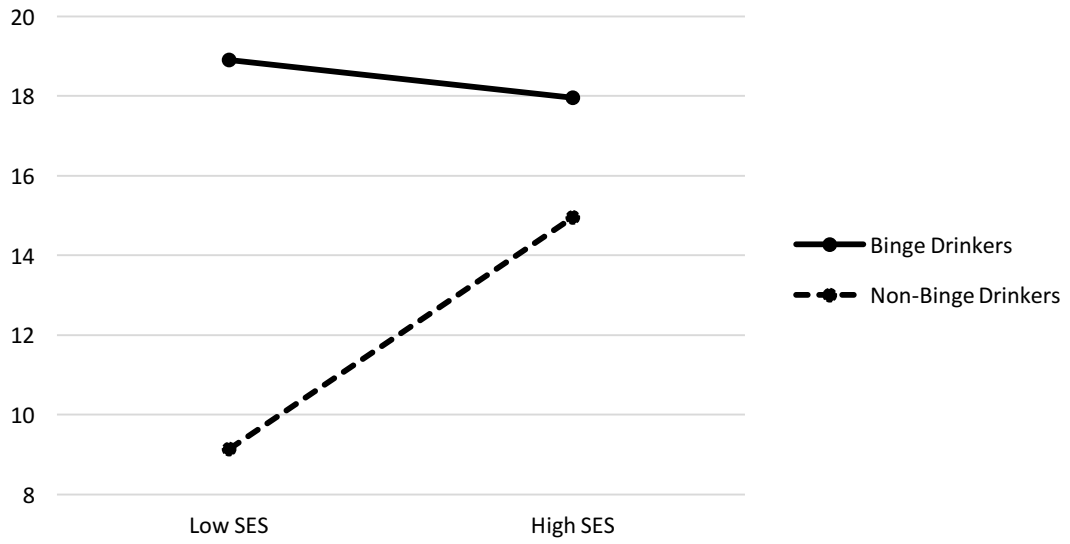


Figure 2. Interaction between Binge-Drinking and SES for Positive Expectancies.

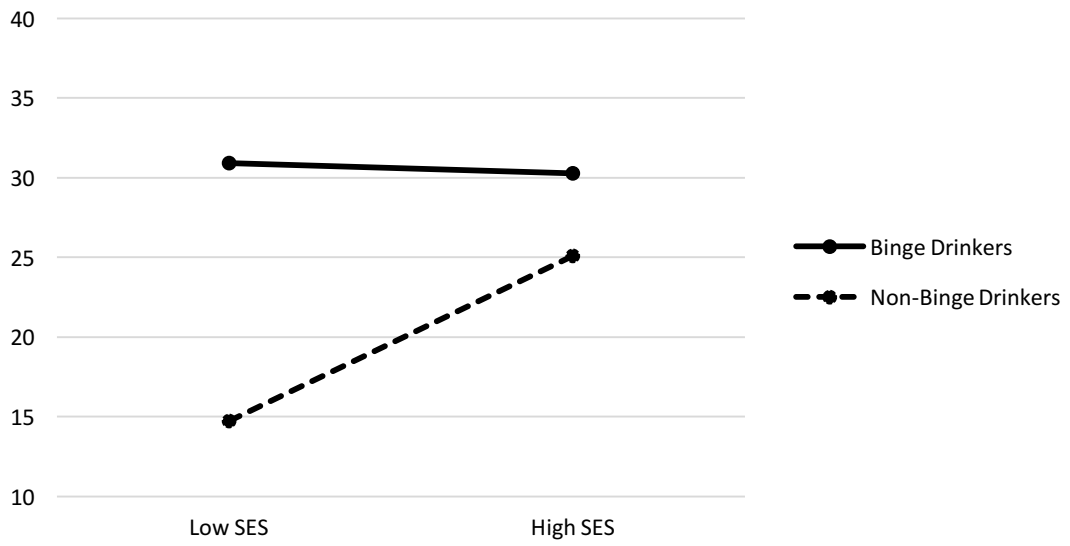


Figure 3. Means of Motivations for Binge-Drinkers.

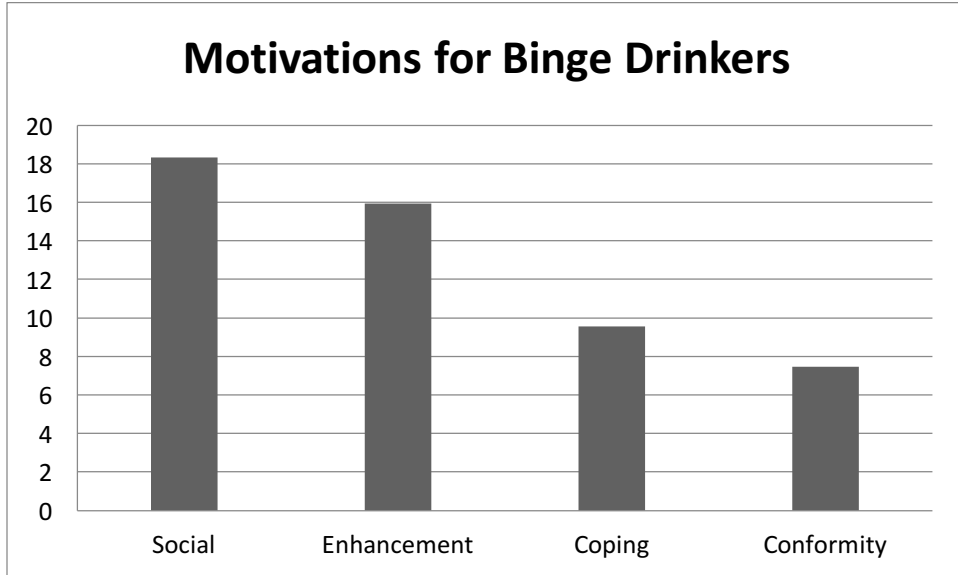
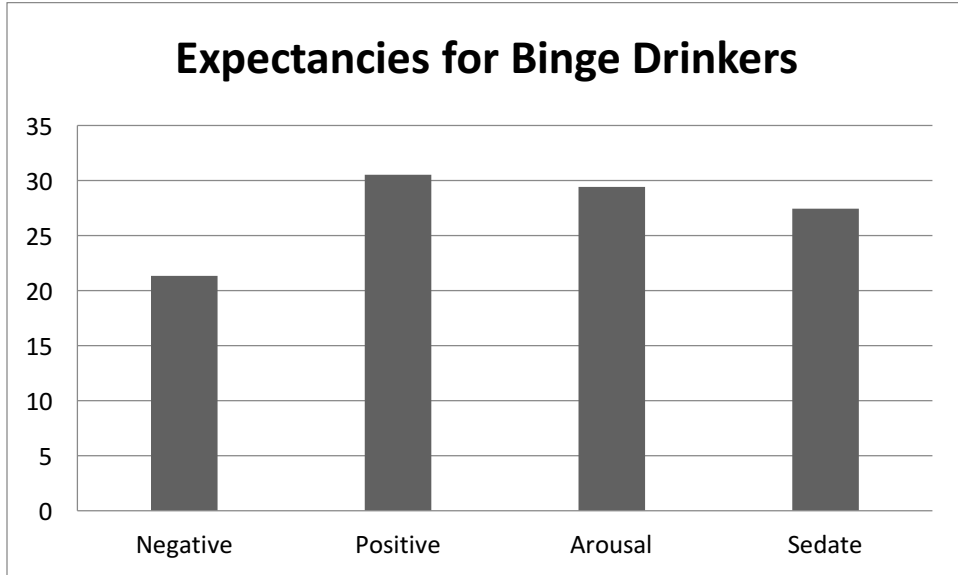


Figure 4. Means of Expectancies for Binge-Drinkers.



Appendix A: Informed Consent

Drinking Behaviors and Motivations

Primary Investigators: Julia Black
Faculty advisor: Caitlin Shepherd, Ph.D

Purpose

I am conducting a research study to examine students' drinking behaviors. I feel that your responses and participation would be valuable for my research in understanding the factors and motivations behind different drinking behaviors.

Procedures

Participation in this study will involve completing an anonymous online questionnaire based on personal experiences. I anticipate that your involvement will require approximately **30 minutes or less**. We have no criteria for excluding anyone from participating in our study. If for any reason, however, the study makes you feel uncomfortable at any point, you are welcome to stop participating. To do so, you can click the "Discontinue" button on your screen, which will direct you to a debriefing form that provides details of the study. If you are a student in PSYC105 participating through the psychology pool you will receive 1/2 research credit for this study. If you are not a PSYC105 student, you will be financially compensated for your participation (\$5).

Risks and Benefits

One potential risk is a breach of confidentiality. This is extremely unlikely due to efforts to maintain confidentiality, as described in the next section. Another potential risk is that participants may experience distress or discomfort due to the sensitive nature of the questions included in this study. You are welcome to decline to participate or discontinue participation at any time, if at any time you are experiencing distress. If you currently have or are dealing with drinking behavior issues, these questionnaires may be particularly sensitive and you are welcome to decline to participate in the study. After you complete the study, you will be directed to the electronic debriefing form which includes information about how to get in touch with Counseling and Psychological Services if you feel these services would be helpful to you.

Confidentiality

Only the researchers involved in this study and those responsible for research oversight will have access to the information you provide. I am aware that it is possible for online data to be hacked and accessed by an outside party. For this reason, the only identifying information for this study will be your name on the electronic copy of this form. This form will in no way be linked with the information you provide on the online questionnaire. This means that not even the researchers in this study will know that the responses you provide came from you. Therefore, in the case of an online security breach, no identifying details will be accessible. Your

anonymous responses will be stored in a password-protected database online and moved to a protected server for long-term storage.

Your information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. You will not be identified in these written materials. We may publish the results of this study; however, we will keep your name and other identifying information private.

Voluntary Participation

Participation in this study is completely voluntary. You are free to decline to participate or to discontinue participation at any time for any reason without penalty.

Questions

If you have any questions about this study, you may contact the primary investigator, Julia Black at jmblack@wesleyan.edu, or the faculty advisor, Caitlin Shepherd Ph.D. at cshepherd@wesleyan.edu. If you would like to talk with someone other than the researchers to discuss problems or concerns, you may contact the Wesleyan University Institutional Review Board chair, Jennifer Rose, electronically at jrose01@wesleyan.edu or by phone at (860) 685-2406 or refer to www.wesleyan.edu/IRB.

Agreement to Participate

[I am at least 18 years of age.] I have read the above information, have had the opportunity to have any questions about this study answered and agree to participate in this study.

Printed name

Date

Signature

Appendix B: Debriefing

Drinking Behaviors and Motivations

Thank you for your participation in this study – I appreciate your time and contribution.

The data collected from this study are for research purposes only. The primary purpose of this study is to gain a deeper understanding of the prevalence, severity, and nature of binge drinking culture on college campuses. In particular, I am looking at social influences and motivations for binge drinking among both athletes and non-athletes. The knowledge gained from this study will hopefully be used to inform the general public and university resources about the extent of this issue among college students.

In this study, participants were asked to complete a short questionnaire include several different measures assessing binge drinking. Surveys included the Drinking Behavior Questionnaire – Revised, Drinking Motives Questionnaire – Revised, Alcohol Expectancy Inventory, and Young Adult Alcohol Problems Screening Test. I hope my results will provide insight into how binge drinking behaviors might differ across different social circles. Additionally, I believe the results of this study will highlight misconceptions that students have about binge drinking and point to specific areas to target in hopefully reducing its presence. While there's significant evidence that binge drinking behaviors are occurring at high rates – especially on college campuses – there is less research that explores viable programs for addressing and reshaping this issue. I hope these results will contribute to our understanding of motivations and influences behind binge drinking behavior.

For PSYC105 students, further information regarding the drinking behavior and the effects of alcohol can be found in **Chapter 4: Consciousness of your course textbook (Gazzaniga, Psychological Science, 5th ed. (2015), W.W. Norton & Company, Incorporated).**

Additionally, you may find the following resources and articles helpful for further information on these topics:

General Information:

Hingson, R., Zha W., & White A. M. (2017). Drinking Beyond the Binge Threshold: Predictors, Consequences, and Changes in the U.S. *American Journal of Preventive Medicine*, 52(6), 717-727.

Please contact Julia Black at jmblack@wesleyan.edu or Caitlin Shepherd, Ph.D. at cshepherd@wesleyan.edu if you have any further questions about the study or would like to receive a summary report with the results of this research when it is completed.

If you feel that you are experiencing distress as a result of this study, please contact Wesleyan's Counseling and Psychological Services (CAPS). The Counseling Center provides free short-term services to all Wesleyan students and can connect students with community resources for long-term services. You may make an appointment with CAPS by phone at 860-685-2910 during business hours (Monday-Friday, 9AM-5PM) or electronically at any time by sending your availability to counseling@wesleyan.edu. If you are experiencing distress that requires immediate attention, same day appointments are available each afternoon (M-F) on a limited basis. You may call CAPS during business hours to request a same day appointment. If you are in need of urgent assistance after business hours, you may call CAPS at any time to speak with the on-call therapist. Below is the comprehensive information for the counseling center at Wesleyan as well as other resources that are available if you are experiencing distress:

Counseling and Psychological Services

Davison Health Center

327 High Street, 2nd Floor

Telephone: 860-685-2910

Email: counseling@wesleyan.edu

Hours: Monday-Friday, 9 AM – 5 PM (with some evening appointments available)

Website: www.wesleyan.edu/caps/

Wesleyan 8-to-8:

Online chat: <http://8-to-8.group.wesleyan.edu/>

Phone: 860-685-7789 (campus ext. 7789)

Thank you again for your participation.

Julia Black

Caitlin Shepherd, Ph.D.

Appendix C: Drinking Motives Questionnaire

Drinking Motives Questionnaire - Revised

	YOU DRINK...	Almost Never/ Never	Some of the time	Half of the time	Most of the time	Almost Always/ Always
1.	To forget your worries.	1	2	3	4	5
2.	Because your friends pressure you to drink.	1	2	3	4	5
3.	Because it helps you enjoy a party.	1	2	3	4	5
4.	Because it helps you when you feel depressed or nervous.	1	2	3	4	5
5.	To be sociable.	1	2	3	4	5
6.	To cheer up when you are in a bad mood.	1	2	3	4	5
7.	Because you like the feeling.	1	2	3	4	5
8.	So that others won't kid you about <i>not</i> drinking	1	2	3	4	5
9.	Because it's exciting.	1	2	3	4	5
10.	To get high.	1	2	3	4	5
11.	Because it makes social gatherings more fun.	1	2	3	4	5

12.	To fit in with a group you like.	1	2	3	4	5
13.	Because it gives you a pleasant feeling.	1	2	3	4	5
14.	Because it improves parties and celebrations.	1	2	3	4	5
15.	Because you feel more self-confident and sure of yourself.	1	2	3	4	5
16.	To celebrate a special occasion with friends.	1	2	3	4	5
17.	To forget about your problems.	1	2	3	4	5
18.	Because it's fun.	1	2	3	4	5
19.	To be liked.	1	2	3	4	5
20.	So you won't feel left out.	1	2	3	4	5

Appendix D: Alcohol Expectancy Inventory

Alcohol Expectancy Inventory

INSTRUCTIONS: This page contains words describing possible effects of alcohol. For each word, imagine it completing the sentence: "**DRINKING ALCOHOL MAKES ME _____.**" Then, for each word mark the number that indicates how often you think that this effect happens or would happen to you after drinking several drinks of alcohol. "Drinking alcohol" refers to drinking any alcoholic beverage such as beer, wine, wine coolers, whiskey, scotch, gin or mixed drinks. There are no right or wrong answers. Answer each item quickly according to your first impression and according to your own personal beliefs about the effects of alcohol.

Drinking alcohol makes me

...

		Never	Very Rarely	Rarely	Occasionally	Frequently	Very Frequently	Always
1.	Appealing	0	1	2	3	4	5	6
2.	Arrogant	0	1	2	3	4	5	6
3.	Attractive	0	1	2	3	4	5	6
4.	Beautiful	0	1	2	3	4	5	6
5.	Cocky	0	1	2	3	4	5	6
6.	Dangerous	0	1	2	3	4	5	6
7.	Deadly	0	1	2	3	4	5	6
8.	Dizzy	0	1	2	3	4	5	6
9.	Drowsy	0	1	2	3	4	5	6
10.	Egotistical	0	1	2	3	4	5	6
11.	Erotic	0	1	2	3	4	5	6
12.	Hazardous	0	1	2	3	4	5	6
13.	Horny	0	1	2	3	4	5	6

14.	Ill	0	1	2	3	4	5	6
15.	Lightheaded	0	1	2	3	4	5	6
16.	Lustful	0	1	2	3	4	5	6
17.	Nauseous	0	1	2	3	4	5	6
18.	Outgoing	0	1	2	3	4	5	6
19.	Sick	0	1	2	3	4	5	6
20.	Sleepy	0	1	2	3	4	5	6
21.	Sociable	0	1	2	3	4	5	6
22.	Social	0	1	2	3	4	5	6
23.	Tired	0	1	2	3	4	5	6
24.	Woozy	0	1	2	3	4	5	6

Appendix E: Young Adult Alcohol Problem Screening Test

Young Adult Alcohol Problem Screening Test

Please read all directions carefully. Circle the number choice(s) you feel best answers the question being asked of you. You may have more than one number circled.

Using the tables below, answer questions 1-8.

First, use this table to determine whether the experience mentioned has occurred in your lifetime.

NO, NEVER	YES, BUT NOT IN THE PAST YEAR
0	1

If your answer is yes, AND this experience has occurred within the past year, use the table below to choose how many times this has occurred within the past year:

1 TIME	2 TIMES	3 TIMES	4-6 TIMES	7-11 TIMES	12-20 TIMES	21-39 TIMES	40 OR MORE TIMES
2	3	4	5	6	7	8	9

1.	Have you driven a car when you knew you had too much to drink to drive safely?	0	1	2	3	4	5	6	7	8	9
2.	Have you had a headache (hangover) in the morning after you had been drinking?	0	1	2	3	4	5	6	7	8	9
3.	Have you felt very sick to your stomach or thrown up after drinking?	0	1	2	3	4	5	6	7	8	9
4.	Have you showed up late for work or school because of drinking, a hangover, or an illness caused by drinking?	0	1	2	3	4	5	6	7	8	9
5.	Have you not gone to work or missed classes at school because of drinking, a hangover, or an illness caused by drinking?	0	1	2	3	4	5	6	7	8	9
6.	Have you gotten into physical fights when drinking?	0	1	2	3	4	5	6	7	8	9
7.	Have you ever gotten into trouble at	0	1	2	3	4	5	6	7	8	9

	work or school because of drinking?										
8.	Have you ever been fired from a job or suspended or expelled from school because of your drinking?	0	1	2	3	4	5	6	7	8	9

Now, for questions 9-20, use the tables below:

First, use this table to determine whether the experience mentioned has occurred in your lifetime.

NO, NEVER	YES, BUT NOT IN THE PAST YEAR
0	1

If your answer is yes, AND this experience has occurred within the past year, use the table below to choose how many times this has occurred within the past year:

1 TIME	2 TIMES	3 OR MORE TIMES
2	3	4

9.	Have you damaged property, set off a false alarm, or other things like that after you had been drinking?	0	1	2	3	4
10.	Has your boyfriend/girlfriend (or spouse), parent(s), or other near relative ever complained to you about your drinking?	0	1	2	3	4
11.	Has your drinking ever created problems between you and your boyfriend/girlfriend (or spouse) or another near relative?	0	1	2	3	4
12.	Have you ever lost friends (including boyfriends or girlfriends) because of your drinking?	0	1	2	3	4
13.	Have you ever neglected your obligations, your family, your work, or school work for two or more days in a row because of your drinking?	0	1	2	3	4
14.	Has drinking ever gotten you into sexual situations you later regretted?	0	1	2	3	4
15.	Have you ever received a lower grade on an exam or paper than you should have because of your drinking?	0	1	2	3	4
16.	Have you ever been arrested for drunk driving, driving while intoxicated, or driving under the influence of alcohol?	0	1	2	3	4
17.	Have you ever been arrested, even for a few hours, because of other drunken behaviors?	0	1	2	3	4
18.	Have you awakened the morning after a good bit of	0	1	2	3	4

	drinking and found that you could not remember a part of the evening before?					
19.	Have you ever had “the shakes” after stopping or cutting down on drinking (for example, your hands shake so that your coffee cup rattles in the saucer or you have trouble lighting a cigarette)?	0	1	2	3	4
20.	Have you ever felt like you needed a drink just after you’d gotten up (that is, before breakfast)?	0	1	2	3	4

For questions 21-27 use the following table to aid you in choosing your answers:

NO, NEVER	YES, BUT NOT IN THE PAST YEAR	YES, IN THE PAST YEAR
0	1	2

21.	Have you ever found you needed larger amounts of alcohol to feel any effect, or that you could no longer get high or drunk on the amount that used to get you high or drunk?	0	1	2
22.	Have you ever felt that you needed alcohol or were dependent on alcohol?	0	1	2
23.	Have you ever felt guilty about your drinking?	0	1	2
24.	Has a doctor ever told you that your drinking was harming your health?	0	1	2
25.	Have you ever gone to anyone for help to control your drinking?	0	1	2
26.	Have you ever attended a meeting of Alcoholics Anonymous because of concern about your drinking?	0	1	2
27.	Have you ever sought professional help for your drinking (for example, spoken to a physician, psychologist, psychiatrist, alcoholism counselor, clergyman about your drinking)?	0	1	2