COLLEGE STUDENTS’ BINGE DRINKING BEHAVIORS: EXPLORING FACTORS AFFECTING ALCOHOL CONSUMPTION THROUGH THE THEORY OF PLANNED BEHAVIOR

A Manuscript Style Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Public Health

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College of Science and Health
Health Education and Health Promotion

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COLLEGE STUDENTS' BINGE DRINKING BEHAVIORS: EXPLORING FACTORS AFFECTING ALCOHOL CONSUMPTION THROUGH THE THEORY OF PLANNED BEHAVIOR

By Jenna L. Willems

We recommend acceptance of this thesis in partial fulfillment of the candidate's requirements for the degree of Master of Public Health in Community Health Education.

The candidate has completed the oral defense of the thesis.

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Thesis accepted

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Graduate Studies Director
ABSTRACT

Willems, J. College students’ binge drinking behaviors: Exploring factors affecting alcohol consumption at UW-L through the theory of planned behavior. MPH in Community Health Education, August 2014, 58pp. (M. Pettit)

Abstract. Binge drinking, a form of excessive alcohol consumption, is a behavior most common among college students worldwide. Past research has shown this practice to have many negative consequences as well as changing fads and trends. Objective. The purpose of this study was to assess the individual and environmental characteristics that affect excessive alcohol consumption behaviors and trends through the framework of the Theory of Planned Behavior. Participants. A total of 445 undergraduate students from the University of Wisconsin-La Crosse participated in the study in March-April of 2014. Participants completed surveys consisting of demographic items as well as items related to alcohol consumption, Theory of Planned Behavior constructs, self-efficacy, and social belonging. Methods. Data were analyzed using logistic regression and analysis of variance. Results. Results indicated a significant correlation between binge drinking and subjective norm, positive attitude, self-efficacy, and behavioral intention to binge drink. Conclusions. Future binge drinking interventions should target 21-22-year-old college students through strategies related to changing perceptions regarding social approval and expectations, attitudes toward binge drinking, and intentions to binge drink.
I would like to thank the following individuals for their guidance and assistance with this research:

- First and foremost, to my thesis committee chairperson; Dr. Michele Pettit. Thank you for your helpful guidance and instruction throughout the thesis process. You’ve allowed me to take the reins while serving as a resource guide around every turn. I sincerely appreciate your outstanding editing and feedback and your dedication and commitment to my thesis research and education. Lastly, thank you for being so easy to work with, I couldn’t have chosen a better thesis chair for my research.

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- Dr. Brenda Rooney, thank you for your encouragement, guidance, and time spent on my project. Thank you for sharing your expertise with me, it has been wonderful to work with someone who has such a committed passion to reducing risky binge drinking behavior. I can’t thank you enough for your assistance with my data analysis. From the very beginning to the end, you’re support has been abundant and is much appreciated.

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INTRODUCTION

Alcohol Consumption Patterns in the United States

Alcohol consumption among adults has long been an issue studied by health professionals. In the last 25 years, researchers and health professionals have seen an extensive change in the alcohol consumption patterns in the United States (Scutchfield & Keck, 2009). Recent trends have indicated alcohol misuse among larger groups of people (e.g., college students), rather than smaller subgroups of people who struggle with risky alcohol behaviors or alcohol dependency. According to Scutchfield and Keck (2009), alcohol is the most frequently used drug among all socioeconomic, racial, and ethnic groups in the nation. With an increase in the range of alcohol-related problems, health professionals have begun to realize the intricacies and escalation of this issue. A need continues for alcohol accessibility and drinking environments to be monitored and controlled (Scutchfield & Keck, 2009).

The definition of binge drinking (also known as heavy episodic drinking) widely used in reports and studies was created by the National Institute of Alcohol Abuse and Alcoholism (NIAAA). NIAAA (2004) defines binge drinking as:

A pattern of drinking that brings a person’s blood alcohol concentration (BAC) to 0.08 gram percent or above, for the typical adult occurring when men consume five or more drinks and when women consume four or more drinks, in about two hours.

Binge drinking is a form of excessive alcohol consumption, however, excessive alcohol consumption also includes underage drinking, heavy drinking, and drinking while
pregnant (Centers for Disease Control and Prevention [CDC], 2013). Excessive alcohol consumption has been a national issue that has fluctuated based on time, population, race/ethnicity, employment, and geographic location. The latest National Survey on Drug Use and Health (NSDUH) reported that 52.1 percent of persons aged 12 years or older are current alcohol users. Additionally, approximately one-fourth of these drinkers, over 59 million Americans, reported binge drinking in the last 30 days (Substance Abuse and Mental Health Services Administration [SAMHSA], 2012).

A recent study examined binge drinking among those 18 years of age and above, revealing that one in every six adults, approximately 38 million Americans, partake in binge drinking regularly (approximately four times a month), consuming, on average, eight drinks per binge drinking episode (CDC, 2012). This national culture of binge drinking was confirmed by a recent *Morbidity and Mortality Weekly Report* (MMWR) which revealed that the highest intensity of binge drinking occurs among the age group of 18-24-year-old adults with an average consumption of approximately 9.3 drinks per drinking occasion (CDC, 2012).

**Wisconsin Drinking Culture**

While every state in the nation has a prevalence of binge drinking, one Midwest state stands out in comparison. Alcohol has long been engrained in the culture and reputation of the state of Wisconsin (Changing the Culture of Risky Drinking Behavior Coalition [CCRDBC], personal communication, 2013). Recent reports have stated that Wisconsin has the highest prevalence rates for binge drinking (ranging from 25.6 to 28.6 percent) and for intensity of drinking. This information is significant as it demonstrates the average person consumes 8.3 to 9.0 drinks per drinking episode (Black & Paltzer,
In addition to having the highest rate of binge drinking for adults, Wisconsin has the highest rate of drinking and driving in the U.S. According to the 2008 National Survey of Drug Use and Health (NSDUH) report, drinking and driving among those 18 and older ranks first for Wisconsin as reflected by a prevalence rate of 26.4 percent (SAMHSA, 2008). Lastly, per capita consumption, underage drinking, and underage binge drinking rates in Wisconsin are all higher than the national rates (Wisconsin Department of Health Services [WDHS], Division of Public Health, & Division of Mental Health and Substance Abuse Services, 2012).

Consequences of Excessive Drinking

The multi-faceted issue of high-risk drinking behavior in college settings cannot be underestimated. Kanny and colleagues (2011) found that environments that support excessive binge drinking can lead to the development of unintentional injuries and death among alcohol users. They estimated excessive alcohol consumption to be the third leading cause of death in the United States, claiming approximately 79,000 lives annually. Furthermore, poor health consequences often are the result of the practice of excessive or binge drinking. The continuum of health consequences can consist of blacking out, alcohol poisoning, assault or rape, motor vehicle accidents, murder, domestic abuse, burns, hypothermia, drowning, or falls resulting in unintentional injuries or death (NIAAA, 2000). Similarly, other studies have determined that excessive drinking can lead to secondary risk behaviors and comorbidities such as fetal alcohol syndrome, high stress levels, poor academic performance, poor mental health, poor sleep patterns, sedentary lifestyles, sexually transmitted infections, suicide, tobacco and/or drug use, unhealthy eating habits, and unintended pregnancy (Weitzman & Nelson, 2004;
Rooney, 2012; NIAAA, 2000; Interagency Coordinating Committee on the Prevention of Underage Drinking [ICCPUD], 2013). A myriad of studies have documented the numerous risks and consequences of excessive drinking. Among college students in the U.S., the total number of alcohol-related deaths was 1,442 in 1998, and rose 27 percent by 2005, accounting for 1,825 deaths (Hingson, Zha & Weitzman, 2009).

Direct and indirect financial consequences related to excessive alcohol consumption often are not publicized, but are present. For instance, according the CDC’s MMWR in 2012, binge drinking accounted for $167.6 billion in economic costs. Economic costs may consist of productivity losses in the workplace, healthcare costs, and criminal justice system costs (CDC, 2012).

Theory of Planned Behavior Related to Excessive Drinking

The Theory of Planned Behavior (TPB) was developed in 2002 by Icek Ajzen as an extension to Ajzen and Fishbein’s Theory of Reasoned Action (TRA). The TPB, which includes the concept of perceived behavioral control, allows for the exploration of factors that contribute to behavioral intention. Perceived behavioral control—the perceived ease or difficulty of performing a behavior—accounts for the ability to control factors that may affect or determine behavior(s) (Glanz, Rimer, & Viswanath, 2008). Within the TPB, beliefs, motivation, and perceived power determine the three main theoretical constructs: attitude (strength of the favorable or unfavorable valuation of a behavior), subjective norm (perceived social pressure, social expectations, and social standards to include perceptions of approval from others), and PBC. These constructs lead to behavioral intention, which, in turn, leads to the behavior or action (U.S. Department of Health and Human Services, National Cancer Institute, 2005).
The TPB provides a framework for understanding the psychosocial determinants of binge drinking behaviors necessary for professionals to effectively address binge drinking among college students. A Britain University study indicated that attitude and subjective norm may influence binge drinking prevalence revealing that, “sixty-seven percent of students felt that the university culture had made binge drinking more acceptable” (Morton & Tighe, 2011, p. 296). Likewise, a recent study on the TPB and alcohol use among Australian college students determined attitude and subjective norm were the two most significant factors influential to one’s binge drinking intention (Ross & Jackson, 2013). The authors concluded that if students have positive attitudes toward binge drinking and perceived support from parents, peers, or professors, they will have a higher intention to participate in binge drinking, pre-gaming, drinking games, and/or other drinking-related trends among the college student population.

In contrast to the aforementioned studies, additional studies on the TPB and binge drinking have found attitude and perceived behavioral control to be the most significant predictors of binge drinking intention among college students (Norman, 2011). Nonetheless, an understanding of the relationships between attitude, subjective norm, and perceived behavioral control is necessary when studying alcohol consumption of college students on both individual and environmental levels.

Note: See Appendix A for an extended literature review.

**Need for the Study**

It is imperative for higher education administrators, instructors, coaches and public health professionals to understand who is participating in risky alcohol consumption, to what extent, and under what circumstances. According to an Executive
Panel Report regarding the research gaps on high-risk college alcohol consumption, there is a gap in the literature regarding college-specific and setting-specific studies which are important due to the drinking issues and/or trends that might be unique to a particular institution (Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, 2002). Ultimately, an understanding of the risky alcohol consumption practices at a college institution can aid in effective prevention policies, environmental change, and appropriate interventions and education to be enacted on campus.

**Purpose of the Study**

The purpose of this study is to determine the specific binge drinking practices of University of Wisconsin-La Crosse (UW-L) students and to assess the individual and environmental characteristics that affect excessive alcohol consumption behaviors and trends through the framework of the Theory of Planned Behavior. This study aims to provide an accurate understanding of the problems and characteristics of excessive alcohol consumption among the UW-L student population.
Research Questions

Research questions for this study are as follows:

1. What is the prevalence of binge drinking among students ages 18-24 at UW-L in relation to age, year in school, and type of current housing?

2. What are the characteristics of binge drinking episodes among students ages 18-24 at UW-L to include: intensity, frequency, and location?

3. Do UW-L students’ attitudes, subjective norms, and perceived behavioral control significantly predict their intentions to engage in binge drinking or serious binge drinking practices?

4. Do self-efficacy and social belonging significantly predict binge drinking and serious binge drinking among UW-L students?

5. Do gender differences exist regarding binge drinking behavior for UW-L students?
MATERIALS & METHODS

Participants

The sample for this cross-sectional study consisted of undergraduate students from the University of Wisconsin La-Crosse (UW-L). A variety of classrooms participated in the study including classes from all three University colleges (College of Science and Health, College of Business, and College of Liberal Studies). Students from the following courses participated: global macroeconomics (1 class; \( n = 26 \)), therapeutic recreation (2 classes; \( n = 67 \)), college writing (1 class; \( n = 20 \)), literature and the human experience (2 classes; \( n = 47 \)), upper-level English language (2 classes; \( n = 33 \)), state/local government (2 classes; \( n = 45 \)), upper-level urban politics (1 class; \( n = 27 \)), upper-level psychology (1 class; \( n = 66 \)), introduction to public health (1 class; \( n = 24 \)), youth education (2 classes; \( n = 48 \)), and upper-level health education (2 classes; \( n = 41 \)). The 17 classes chosen were selected through convenience sampling and eight of the 17 classes involved general education courses.

Instrument

The instrument used in this study was a 35-item questionnaire (See Appendix B) modified slightly from Ross and Jackson’s (2013) study conducted at Melbourne University in Australia. Minor modifications were made to questions to reflect the name and culture of the university and surrounding community. Additional demographic questions were adopted from Wechsler (2005). The questionnaire consisted of 21 Likert-scale questions of which 11 questions were negatively scaled to prevent response bias from participants. A standard drink was defined in the questionnaire as “a 12-ounce can
or bottle of beer, a 4-ounce glass of wine, a 12 ounce bottle or can of wine cooler, or a shot of liquor straight or in a mixed drink.”

The questionnaire included items to assess alcohol-related behaviors, Theory of Planned Behavior (TPB) constructs (attitude, subjective norm, perceived behavioral control, and behavioral intention), self-efficacy and social belonging, and demographics. Attitude, the strength of the favorable or unfavorable valuation of the behavior, was measured through Q31 using five word pairs of which one of each were chosen. Subjective norm, the perceived social approval and expectations of the behavior, was measured through Q13-Q15 and Q21-Q24. Perceived behavioral control (PBC), described as the amount of perceived control over a behavior, was measured by Q18-Q20. Behavioral intention, described in the TPB as the intent to perform a behavior, was measured via Q10-Q12. Self-efficacy, the perceived confidence to perform a behavior, was measured by Q16 and Q17. Lastly, social belonging, in relation to identity and social standards surrounding a behavior, was measured through Q25-Q30.

All predictor variables (subjective norm, PBC, behavioral intention, self-efficacy, and social belonging), with the exception of attitude, were measured on a scale of 1-7 (1 = low risk, 7 = high risk). Attitude, was measured on a 0-5 scale (0 = negative attitude, 5 = positive attitude). Cronbach’s alpha coefficients were calculated to evaluate internal reliability of the instrument scales for the predictor variables. All scales for the predictor variables had recommended Cronbach’s values of 0.7 or greater (Pallant, 2010), with the exception of PBC which had a Cronbach alpha of 0.62 (attitude, α = 0.84; subjective norm, α = 0.89; intention, α = 0.93; self-efficacy, α = 0.73; and social belonging, α = 0.86), indicating overall strong consistency among the questions for each variable.
Procedures

Approval for this study was obtained from the UW-L Institutional Review Board (IRB). Following IRB approval, students were asked to complete the questionnaire during class time. Prior to completing the questionnaire, participants were given an informed consent form and were verbally informed that their participation was voluntary and anonymous (See Appendix C). Professors were asked for classroom time via e-mail messages stating the purpose of the study and options for participation. Data were collected in-person from March 25, 2014 to April 28, 2014.

Statistical Analyses

Prior to statistical analyses, data were evaluated for outliers and errors by examining the frequencies of each variable. Descriptive statistics (i.e., means and standard deviations) were obtained for each binge drinking predictor variable to include all four theoretical constructs of the TPB, self-efficacy, and social belonging. Statistical Analysis Software (SAS) Institute Inc., Version 9.3, was utilized for statistical analyses. To evaluate the relationships between variables related to the TPB and binge drinking, Pearson Correlation Coefficients ($r$) were performed. Univariate analysis was completed to assess binge drinking prevalence based on demographic variables (i.e., gender, age, school standing, and housing) using chi-square. Analysis of Variance (ANOVA) was performed to compare the mean values of indicators for binge and serious binge drinking. Multivariate analysis was completed in the form of logistical regression to assess the extent to which age, attitude, subjective norm, PBC, behavioral intention, and self-efficacy predicted binge drinking. Alpha levels were set at 0.05 for all analyses.
RESULTS

Demographics

A total of 445 students participated in this research study. Of the 445 participants, 149 (34%) identified as male, 294 (66%) identified as female, and 1 (< 1%) individual identified as transgender. Data were obtained from undergraduates in all five class standings to include: 20.3% \((n = 90)\) freshman, 32.2% \((n = 143)\) sophomore, 23.4% \((n = 104)\) junior, 18.9% \((n = 84)\) senior, and 5.2% \((n = 23)\) fifth-year senior or beyond. Forty-two percent \((n = 186)\) of students reported living in some form of on-campus housing, while the remaining 58% \((n = 257)\) reported living off-campus.

Binge and Serious Binge Drinking Rates

The majority of participants, \((n = 244, 55.2\%)\), reported binge drinking in the last two weeks (See Table 1). Serious binge drinking, classified as 3 or more episodes in the last two weeks, was prevalent among 23.8% \((n = 105)\) of participants. Of the students that reported binge drinking, the average number of drinks consumed in their last binge episode was 6.86. According to univariate analysis, the rate of binge drinking was significantly higher in males than females with 72% \((n = 108)\) of males reporting at least one binge drinking episode in the last two weeks versus 46% \((n = 136)\) of females (See Table 1). In addition to binge drinking, males in the study also were more likely than females to partake in serious binge drinking (33.6% and 18.7% respectively, \(p < 0.01\)). Correspondingly, class standing was positively correlated to binge drinking. As class standing increased, binge drinking (and serious binge drinking) rates did likewise (40%,
50%, 53%, 75%, and 78%, respectively, \( p < 0.01 \). The highest prevalence of reported binge drinking and serious binge drinking was found among those of recent legal drinking age, 21-22 (66.9% and 32.5%, respectively; \( p < 0.01 \)) followed by respondents 23+ years of age (64.9% and 24.3%, respectively; \( p < 0.01 \)). Students who reportedly lived in off-campus housing (off-campus housing or parent/guardian home) had higher rates of both binge drinking and serious binge drinking (66.5% and 28.4%, respectively; \( p < 0.01 \)). Of the 244 participants who reported binge drinking in the last two weeks, the most common locations for binge drinking were an “off-campus bar or club” or an “off-campus party.” Of those who attended an off-campus party in the last 30 days (\( n = 219 \)), 74% (\( n = 162 \)) reported binge drinking the last time. Likewise, of those who attended an off-campus bar/club in the last 30 days (\( n = 156 \)), 78% (\( n = 122 \)) reported binge drinking during their last visit.

**Theory of Planned Behavior and Binge Drinking**

Pearson correlation coefficients indicated intention to binge drink was strongly and positively correlated with attitude (\( r = 0.63 \)), subjective norm (\( r = 0.67 \)), and perceived self-efficacy (\( r = 0.65 \)), but weakly correlated with social belonging (\( r = 0.19 \)) (See Table 2). Perceived behavioral control (PBC) was not statistically correlated with behavioral intention, but was negatively correlated with self-efficacy to binge drink, \( r = -0.17 \). Correlation results suggest attitude, subjective norm, and self-efficacy are interrelated with strong correlations to binge drinking. Furthermore, in evaluating serious binge drinking levels, the strongest theoretical constructs with a moderate correlation to serious binge drinking were attitude (\( r = 0.45 \)) and behavioral intention (\( r = 0.47 \)).
Analysis of variance (ANOVA) was utilized to compare the mean values of indicators for binge and serious binge drinking, with a higher mean signifying higher risk to binge drink or serious binge drink (See Table 3). Of all the predictor variables (except attitude), measured on a seven point scale, the highest risk to binge drink was associated with self-efficacy and social belonging ($m = 5.33$ and $m = 5.34$, respectively; $p < 0.01$) and the highest risk to serious binge drink was associated with behavioral intention and social belonging ($m = 5.68$ and $m = 5.48$, respectively; $p < 0.01$).

Multivariate analysis in the form of logistical regression was used to explore the predictive ability of the independent predictor variables related to the TPB (attitude, subjective norm, and perceived behavioral control) and assess the relative contribution of each predictor variable to the variance of binge drinking (See Table 4). After adjusting for intention, subjective norm, and self-efficacy, additional variables outside of the TPB that held the strongest influence on binge drinking practices were age and self-efficacy. For example, 21-22-year-olds were 4.6 times more likely to binge drink than 18-20-year-olds. Furthermore, for every 1-point increase in intention to binge drink and self-efficacy of binge drinking, there was nearly a 1.5 times odds of binge drinking. The most significant component of the TPB related to binge drinking was subjective norm. For every 1-point increase in the subjective norm scale, individuals were 2.1 times more likely to partake in binge drinking.

Results for serious binge drinking were slightly different as subjective norm was a non-significant predictor of the behavior. Strong intention to binge drink among participants resulted in a 1.6 odds of serious binge drinking, and PBC resulted in a 1.8 odds of serious binge drinking. A positive attitude toward binge drinking showed a 1.4
odds of participating in serious binge drinking. Overall, students with a positive attitude towards binge drinking, a higher intention to binge drink, and higher perceived behavioral control over binge drinking were more likely to serious binge drink.

### Table 1. Demographics and Predictors Related to Binge Drinking (Univariate Analysis)

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Percent who Binge Drank (1+ time(s) in last two weeks)</th>
<th>Percent who Serious Binge Drank (3+ times in past two weeks)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Significance</td>
<td>Significance</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>72.5%</td>
<td>33.6%</td>
</tr>
<tr>
<td>Female</td>
<td>46.3%</td>
<td>18.7%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-20</td>
<td>46.0%</td>
<td>18.0%</td>
</tr>
<tr>
<td>21-22</td>
<td>66.9%</td>
<td>32.5%</td>
</tr>
<tr>
<td>23+</td>
<td>64.9%</td>
<td>24.3%</td>
</tr>
<tr>
<td>School Standing</td>
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</tr>
<tr>
<td>Freshman</td>
<td>40.0%</td>
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</tr>
<tr>
<td>Sophomore</td>
<td>50.4%</td>
<td>18.2%</td>
</tr>
<tr>
<td>Junior</td>
<td>52.9%</td>
<td>26.9%</td>
</tr>
<tr>
<td>Senior</td>
<td>75.0%</td>
<td>34.5%</td>
</tr>
<tr>
<td>Fifth Year +</td>
<td>78.3%</td>
<td>30.4%</td>
</tr>
<tr>
<td>Housing</td>
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<tr>
<td>On-campus</td>
<td>39.3%</td>
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<td>Off-campus</td>
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<td>2</td>
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<td>----------------------------------------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>1. Attitude</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>2. Subjective Norm</td>
<td>0.60**</td>
<td>-</td>
</tr>
<tr>
<td>3. Perceived Behavioral Control</td>
<td>0.10</td>
<td>-0.04**</td>
</tr>
<tr>
<td>4. Behavioral Intention</td>
<td>0.63**</td>
<td>0.67**</td>
</tr>
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<td>5. Self-efficacy</td>
<td>0.49**</td>
<td>0.61**</td>
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<tr>
<td>6. Social Belonging</td>
<td>0.13*</td>
<td>0.12*</td>
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<tr>
<td>7. Binge Drinking</td>
<td>0.52**</td>
<td>0.56**</td>
</tr>
<tr>
<td>8. Serious Binge Drinking</td>
<td>0.45**</td>
<td>0.36**</td>
</tr>
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</table>

*Significant at $p < 0.05$; ** Significant at $p < 0.01$

<table>
<thead>
<tr>
<th>Binge Drinker</th>
<th>Yes</th>
<th>No</th>
<th>Significance</th>
<th>Serious Binge Drinker</th>
<th>Yes</th>
<th>No</th>
<th>Significance</th>
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</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>2.59</td>
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<td>$p &lt; 0.01$</td>
<td>3.25</td>
<td>1.32</td>
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<td>Subjective Norm</td>
<td>4.76</td>
<td>3.38</td>
<td>$p &lt; 0.01$</td>
<td>4.95</td>
<td>3.90</td>
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<td>Perceived Behavioral Control</td>
<td>1.79</td>
<td>1.82</td>
<td>$p &lt; 0.76$</td>
<td>2.08</td>
<td>1.71</td>
<td></td>
<td>$p &lt; 0.01$</td>
</tr>
<tr>
<td>Intention</td>
<td>5.02</td>
<td>2.34</td>
<td>$p &lt; 0.01$</td>
<td>5.68</td>
<td>3.24</td>
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</tr>
<tr>
<td>Self-efficacy</td>
<td>5.33</td>
<td>3.22</td>
<td>$p &lt; 0.01$</td>
<td>5.57</td>
<td>4.01</td>
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<tr>
<td>Social Belonging</td>
<td>5.34</td>
<td>4.96</td>
<td>$p &lt; 0.01$</td>
<td>5.48</td>
<td>5.07</td>
<td></td>
<td>$p &lt; 0.01$</td>
</tr>
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</table>
## Table 4. Predictors of Binge & Serious Binge Drinking (Multivariate Analysis)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Binge Drinking</th>
<th></th>
<th>Serious Binge Drinking</th>
<th></th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Odds Ratios (95% CI)</td>
<td>Odds Ratios (95% CI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>NS</td>
<td>1.44 (1.15, 1.80)</td>
<td>2.08 (1.43, 3.03)</td>
<td>NS</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>2.08 (1.43, 3.03)</td>
<td>NS</td>
<td>1.79 (1.27, 2.53)</td>
<td>NS</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>NS</td>
<td>1.79 (1.27, 2.53)</td>
<td>1.44 (1.16, 1.78)</td>
<td>NS</td>
</tr>
<tr>
<td>Intention</td>
<td>1.49 (1.23, 1.81)</td>
<td>1.64 (1.34, 2.02)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>1.44 (1.16, 1.78)</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>21-22 : 18-20</td>
<td>4.56 (2.16, 9.63)</td>
<td>2.75 (0.86, 8.80)</td>
<td>NS</td>
</tr>
<tr>
<td>23 + : 18-20</td>
<td>2.75 (0.86, 8.80)</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NS = Non-significant
DISCUSSION

The purpose of this exploratory study was to assess the individual and environmental characteristics that affect excessive alcohol consumption behaviors and trends through the framework of the Theory of Planned Behavior (TPB) by examining the binge drinking practices of undergraduate students at the University of Wisconsin-La Crosse (UW-L). The importance of studying this topic at UW-L was confirmed as prevalence results show over half of the sample population (55.2%, n = 244) self-reported binge drinking on at least one occasion in the last two weeks.

In exploring the predictability of the constructs of the TPB, it was found that all major theoretical components predicted binge drinking behaviors with the exception of perceived behavioral control. Subjective norm was found to have a strong correlation to both intention to binge drink (r = 0.67) and binge drinking (r = 0.56), which has been confirmed only in a few other studies (French & Cooke, 2012; Johnston & White, 2003; Morgan & Tighe, 2011). The present study’s findings were consistent with other studies which confirmed attitude and behavioral intention to be significant predictors of binge drinking (Cooke, Sniehotta, & Schuz, 2007; French & Cooke, 2012; Johnston & White, 2003; Norman, 2011). Similarly, studies, including the one conducted by Ross and Jackson (2013), confirmed that perceived behavioral control (PBC) was not a strong predictor of binge drinking, supporting the earlier version of the theory (the Theory of Reasoned Action) to be most effective in predicting binge drinking behaviors (Johnston & White, 2003). With self-efficacy, a similar component to PBC, showing prediction to
intention to binge drink and binge drinking, further research should expand on the role of PBC in relation to binge drinking.

The finding of self-efficacy as a predictive variable to binge drinking is profound as self-efficacy beliefs are personally and socially constructed and often can predict behavior better than actual capabilities and skills (Pajares, 2002). Frank Pajares (2002) acknowledges the power of self-efficacy beliefs by stating, “This helps explain why people's behaviors are sometimes disjoined from their actual capabilities and why their behavior may differ widely even when they have similar knowledge and skills.” Binge drinking, in relation to self-efficacy, can be addressed by understanding that interventions should focus on the four sources from which personal self-efficacy is derived: mastery experience (performance attainment), vicarious experience (“if others can do it”), social persuasion, and physiological states (Bandura, 1977).

The present study analyzed level of binge drinking in two categories—occasional binge drinking (1+ occurrence(s) in the past two weeks) and serious binge drinking (3+ occurrences in the past two weeks)—in conjunction with the TBP. Results confirm that constructs of the TPB more strongly predict serious levels of binge drinking. For example, PBC was not significant in predicting binge drinking, but was significant when predicting serious binge drinking. Additionally, attitude was found to be more predictive of serious binge drinking. A strong positive attitude towards binge drinking is more common among serious binge drinkers than less serious binge drinkers and non-binge drinkers. This finding points to a need to focus on changing attitudes towards binge drinking. With PBC and binge drinking levels, it was more common for those that partake in serious binge drinking to have strong perceived behavioral control, compared
to those who binge drink less frequently and non-binge drinkers. The construct of subjective norm had the strongest odds ratio for binge drinking, meaning of all the variables in the TPB, binge drinkers were most influenced by subjective norm. Seo and Li (2009) have affirmed the influence of school-based subjective norm and climate, stating individuals develop collective perceptions of drinking on their campus and that these perceptions are related to students’ likelihood to binge drink. Lastly, gender was found to be significant as males were more likely than females to binge drink. This finding was supported by a recent study conducted by Iwamoto, Corbin, Lejuez, and MacPherson (2014), who found a connection between binge drinking and masculinity. Likewise, another recent study by Montauti and Bulmer (2014), found gender to be a risk factor to binge drinking. In this study, gender was no longer a strong predictor variable when compared to other variables in multivariate analysis, suggesting males are more likely to binge drink but subjective norm, attitude, and intention have stronger predictability of binge drinking than gender. Nonetheless, this does not discount the finding that 72% of males in the study self-reported binge drinking. Other predictors of binge drinking at UW-L were age and location of residence with those living off-campus and those 21-22-years-old participating in binge drinking most frequently. This could be attributed to living without supervision, a greater sense of independence living off-campus, and to greater accessibility of alcohol, once at the minimum legal drinking age.

**Recommendations**

With the predictive power of subjective norm, college binge drinking prevention programs should address social pressure, expectations, and approval. Additionally, more setting-specific research is needed to explore the cultural influences at particular
institutions that give rise to binge drinking. Furthermore, other studies discuss the need for institutions to conduct binge drinking prevention efforts on the high-risk groups that are particular to their student population versus following the “one-size-fits-all” approach (Seo & Li, 2009; Weschler et al., 2002). Following this recommendation, interventions at UW-L should target the 21-22-year-old and 23+ age groups, males, and students living in off-campus housing.

These populations may be accessed by reaching out to student groups such as fraternities, athletes, or student organizations. Older students, living off-campus can be reached effectively through evidence-based computer programs focused on risky alcohol use (Carey, Scott-Sheldon, Elliott, Bolles, & Carey, 2009). In order to influence attitude, positive alcohol expectancies and education on awareness of the dangers of alcohol use, should be addressed. Likewise, drink size and blood alcohol content (BAC) education should occur as harm reduction techniques. Future recommendations to address subjective norm, in a particular college climate, include student led initiatives and/or peer education which have been proven to be effective approaches (Planken & Boer, 2010). Social norming or social media campaigns on-campus and off-campuses also should be utilized with other interventions as part of a comprehensive approach to decrease binge drinking (NIAAA, 2007). Another recommendation includes mandatory small group education sessions or focus groups. Furthermore, strategies that have been confirmed effective with the college population include community-based efforts that: limit alcohol outlet concentration, promote substance-free housing, ban alcohol marketing on campus, raise alcohol prices and eliminate price specials (e.g., happy hours) (Wechsler et al., 2002; Windle & Zucker, 2010). Ultimately, binge drinking must be addressed from a
community approach meaning higher education administrators, local coalitions, and other public health professionals in the area need to support and prioritize binge drinking interventions and policy change on campus in light of the widespread binge drinking results found in this study.

Research should be continual on this worldwide public health issue. Further research should address the positive alcohol expectancies of college students to determine if expectancies predict binge drinking in conjunction with the theoretical constructs shown to contribute: attitude, subjective norm, and self-efficacy. Other areas for continued research should include examining aspects of pregaming in relation to binge drinking intention and social facilitation of drinking practices (i.e., the effects in social situations that one desires as a result of alcohol consumption). Future studies regarding binge drinking practices and the TPB should be longitudinal in which two surveys are given to participants overtime to more accurately determine the theory’s prediction of the behavior.

**Limitations**

Limitations to the present study include participants self-reported drinking behaviors which could have involved recall bias, in which accuracy of answers may have been affected with participants having to remember events or experiences from the past (Fadnes, Taube, & Tylleskär, 2009). In this study, participants were asked to focus on binge drinking practices in either the last two weeks or last 30 days. Additionally, recall bias may have been heightened due to loss of memory and/or blackouts as consequences of binge drinking. Participants’ responses to the survey also may have been affected by the limitations inherent to survey research (e.g. social desirability) as well as the norms
around alcohol use and the influence of taking the survey next to peers and/or classmates. Additionally, students in 9 of the 17 classes participated in the study within two weeks of the end of UW-L’s spring break. This aspect may have led to inaccuracies of normal binge drinking behaviors and/or skewed the frequency of binge drinking sessions.

Note: This thesis was prepared according to manuscript guidelines for the *Journal of American College Health*. 
REFERENCES


Timberlake, D., Hopfer, C., Rhee, S., Friedman, N., Haberstick, B., Lessem, J., & Hewitt,


APPENDIX A
EXTENDED LITERATURE REVIEW
Literature Search Strategies

For this systematic review of the literature, the online journal databases CINAHL and ERIC were utilized. Various combinations of the following terms were searched: binge, drinking, college, university, alcohol, campus, Wisconsin, consumption, students, characteristics, risk factors, prevalence, environment, culture, exploratory, social norms, and theory of planned behavior or TPB. To lessen the number of relevant results, the searches were limited by peer-reviewed articles and often by the population age range, “adults 18-44.” There were no search limitations placed on the dates the articles were published. Additionally, some sources were located using the reference lists of selected peer-reviewed journal articles. Internet searches via the Google search engine also were conducted to locate relevant websites, publications, and government documents.

Standards Related to Excessive Alcohol Consumption

As drinking to excess has become a common and dangerous activity nationwide, the topic of binge drinking has been added to the Department of Health and Human Services’ Healthy People 2020 objectives. There are ten objectives in Healthy People 2020 that relate to alcohol abuse and three that specifically relate to binge drinking. These include substance abuse goal SA-14- reduce the proportion of persons engaging in binge drinking of alcoholic beverages, SA-15- reduce the proportion of adults who drank excessively in the previous 30 days, and SA-16- reduce average annual alcohol consumption (U.S. Department of Health and Human Services, 2013). It is critical for individual states to take responsibility in accomplishing these national goals, particularly those states with high prevalence rates of binge drinking.
La Crosse County Alcohol Consumption

The total 2010 population in the County of La Crosse, Wisconsin was 114,640 including 45,650 individuals classified as adults, aged 18-44 (Wisconsin Department of Health Services, 2010). La Crosse County has been known to have a high rate of adult binge drinking in the state of Wisconsin. The latest Behavior Risk Factor Surveillance Survey (BRFSS) which measured La Crosse County adult binge drinking in 2008, reported 65 percent of La Crosse County adults currently use alcohol and 22 percent participate in binge drinking practices (WDHS, Division of Public Health, & Division of Mental Health and Substance Abuse Services, 2012).

Characteristics that give rise to the culture of alcohol consumption in La Crosse County include local festivals, nearby college institutions, alcohol outlet concentration, and geographic location. Annually, the city of La Crosse is home to the well-known binge drinking holiday, “Oktoberfest.” In the first 72 hours of Oktoberfest 2013, from September 27th to September 30th, police responded to 1,078 calls for services related to alcohol and issued 266 alcohol violations (Jungen, 2013). Police also stated they have witnessed more on-campus and near-campus drinking activity than in past years. In addition to this festival, the city of La Crosse is located on the coast of the Mississippi River and is home to three major college institutions—the University of Wisconsin-La Crosse (UW-L), Viterbo University, and Western Technical College. UW-L is the largest of the institutions, with an enrollment of 10,427 students in 2013 (UW-La Crosse, 2013). The number of colleges in La Crosse is significant as research states the college environment and atmosphere itself places students at high risk for participating in risky drinking behaviors such as binge drinking (Timberlake et al., 2007).
The area’s college institutions were studied for binge drinking prevalence in the revised 2012 Burden Report for La Crosse County (Rooney, 2012). The report revealed that 64 percent of college students reported drinking alcohol in the past month and 36 percent reported binge drinking within the past two weeks. For UW-L, 2012 data were not available in this report and prevalence data were collected from the 2008 National College Health Survey (NCHS). These data represented 391 students, of which 75 percent were female (Rooney, 2012). Though it is apparent that college students are drinking more and in different ways than in the past, there is a gap in the literature regarding research representative of the UW-L campus population.

One thing is known with certainty; alcohol consumption in this county has had a direct impact on the health and safety of college-aged individuals in recent years. According to the 2012 Burden Report, four individuals, aged 15-24, died as a direct result of alcohol-related incidents from 2008 to 2011 (Rooney, 2012). Another death occurred in February of 2013 when a 23-year-old UW-L student died of hypothermia as a consequence of her BAC and intoxication level (Anderson, 2013).

**Consequences of Excessive Alcohol Consumption in La Crosse**

In La Crosse County alone, in 2011, excessive alcohol consumption led to a total of 28 deaths, 1,285 hospitalizations, and 2,044 alcohol-related arrests (Black & Paltzer, 2013). The numbers of injuries/deaths occurring from alcohol consumption in La Crosse County are stark, yet preventable for future generations. For La Crosse County college students, since 1997, nine students with significant BAC levels have drowned in nearby rivers. Commonality occurred in all nine cases as each individual drowned after consuming alcohol in La Crosse’s downtown area; only two blocks from the river’s edge.
(Anderson, 2013). These notorious cases of preventable deaths have gained UW-L and other surrounding institutions a reputation for their excessive alcohol consumption and safety concerns (CCRDBC, personal communication, 2013). This reputation has been perpetuated by media reports from sources like Rehabs.com, which ranked UW-L as the number one college in the nation for alcohol related arrests in 2012 (Rehabs.com, 2013).

Furthermore, economic influence occurs as a result of alcohol consumption. In 2011, the economic impact of excessive alcohol consumption in La Crosse County reached $105 million, which translates to $916 dollars/year for each La Crosse County resident (Black & Paltzer, 2013). As indicated by the aforementioned data, risky drinking trends in La Crosse County are having significant impacts on the physical and economic wellbeing of the county.

**Alcohol Consumption Trends on College Campuses**

Excessive alcohol consumption among the college population often is viewed as a necessary and typical component of the college experience and is reinforced by peers, parents, and professors in the college setting (Colby, Colby, & Raymond, 2009). This normalization has made binge drinking an acceptable and expected behavior for the average young adult student. Colby and colleagues’ qualitative research confirms that college students perceive drinking consequences to be more severe in the real world than in the college atmosphere. In fact, students perceive excessive alcohol consumption to have minimal negative consequences and to be part of the “college experience” (Colby, Colby, & Raymond, 2009). Researchers have confirmed that college students are more likely to partake in risky drinking behaviors such as binge drinking, than their non-student peers (Stinson et al., 2006). Since 2002, rates of excessive alcohol consumption...
among college students have steadily remained high and above the rates of non-college students 18-22 years of age (SAMHSA, 2012). Further compounding the negative consequences of alcohol misuse experienced by this group are new fads and trends related to binge drinking.

“Pre-gaming” and Drinking Games

Drinking games, which once were considered a main event, are now part of a ritual as drinking before drinking at a planned social event is an increasingly popular activity. The pre-gaming trend is a newer phenomenon on college campuses that has emerged in the last few decades and has been found to increase one’s consumption of alcohol and BAC level (Barry, Stellefson, Piazza-Gardner, Chaney, & Dodd, 2013). The pre-gaming practice is defined as, “the consumption of alcohol prior to attending an event or activity (e.g. party, bar, concert) at which more alcohol may be consumed” (Pedersen & LaBrie, 2007, p. 237). Two recent studies on east coast college students found the range of pre-gaming behaviors to take place in 64 to 67 percent of students that consume alcohol (Read, Merrill, & Bytschkow, 2010), with an average of 4-5 alcoholic drinks being consumed per pregaming session (DeJong, DeRicco, & Schneider, 2010).

Thomas Vander Ven (2011), author of Getting Wasted: Why College Students Drink Too Much and Party Too Hard, provides information to those studying college drinking consumption patterns. Vander Ven’s research discovered approximately 40 percent of students mentioned participating in some form of a drinking game during their usual pregaming rituals. The main motivations for the pregaming and drinking game activities generally included: getting intoxicated, intoxicating others, meeting new people, and having fun (Vander Ven, 2011).
Aside from motivations and perceptions, Clapp and colleagues (2006) found a relationship between alcohol consumption and the physical environment. Their study revealed that greater alcohol consumption among students occurred at house parties where no hosts were present (BYOB-bring your own beer), illicit drug use was present, and/or drinking games occurred. An understanding of the influence of social and environmental factors is imperative as individuals may be unaware of the impact and the perceptions of their peers’ behaviors on their binge drinking behaviors (G. Gilmore, personal communication, July 2, 2013).

**Environmental Determinants of College Student Binge Drinking**

The key determinants of binge drinking at colleges and universities are not fully known and potentially vary for each individual institution (Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, 2002). For example, the UW-L tradition of Oktoberfest plays a large role in the binge drinking epidemic in the city of La Crosse. Another environmental determinant is geographical location. As discussed previously, the city of La Crosse is located directly on the Mississippi River with all three local institutions in close walking distance. In addition, the alcohol outlet concentration, (i.e., number of licensed establishments selling alcohol) (WDHS, 2012) of La Crosse may influence the county’s alcohol issues. The Task Force on Community Preventive Services (2009) has confirmed that high alcohol outlet concentration has a direct correlation to excessive alcohol consumption in communities and the related harms from such alcohol use. In the 2011-2012 calendar year, the city of La Crosse had the highest number of new and renewed alcohol licenses issued in the County. There were a total of 196 licenses issued; 46 of those were class A licenses (licensed to establishments such as grocery
stores or convenience stores), while 143 were class B licenses (licensed to establishments such as bars and restaurants) (WDHS, 2012). Other environmental factors that potentially contribute to binge drinking in La Crosse include alcohol advertising in the area and on-campus advertising specific to the college population. Campus policies on alcohol consumption and students’ awareness of those policies also represent potential environmental determinants (Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, 2002).

Researchers must not ignore the impact of peers when assessing the college population as research confirms that peers have the greatest influence on students’ social norms (Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, 2002). Social, or descriptive norms, are defined by Burger and colleagues as, “our perceptions of how people (or people like us) typically behave in a given situation” (Burger, LaSalvia, Hendricks, Mehdipour, & Neudeck, 2011, p. 220). In their latest study, they discovered a correlation between social norms and drinking behaviors. More specifically, the quantity of alcoholic beverages students consumed was strongly associated with the quantity they perceived other student peers to be consuming. In a similar report from the NIAAA’s task force on college drinking, researchers stated that, “The phenomenon of perceived social norms—or the belief that ‘everyone’ is drinking and drinking is acceptable—is one of the strongest correlates of drinking among young adults and the subject of considerable research” (NIAAA, 2007, p. 7). Understanding the perceived social norms of binge drinking at UW-L is necessary to understand the depth and resolution to this health issue.
Summary

Excessive alcohol consumption and binge drinking among college students are common practices in the United States, the state of Wisconsin, and La Crosse County. These practices have a plethora of unintended consequences, including injury and death, among college students. La Crosse is notorious for issues related to binge drinking due to alcohol-related drownings and one of the largest drinking festivals in the nation. Binge drinking trends on college campuses have changed in the past few decades with the emergence of new drinking games, pregaming practices, and other means of consumption. Preliminary research suggests that constructs of the TPB (i.e., attitude, subjective norm, perceived behavioral control, and behavioral intention) may affect the practice of binge drinking and may be useful when studying alcohol consumption among college students. In order to change the culture of risky drinking, particularly at UW-L, the prevalence of binge drinking episodes and the individual and environmental characteristics related to excessive consumption of alcohol must be identified and further understood.
APPENDIX B

INSTRUMENTATION
Alcohol Consumption Behaviors and Perceptions Questionnaire

Alcohol-related behaviors

The following questions ask about how much you drink. A “drink” means any of the following:

- A 12-ounce can or bottle of beer
- A 4-ounce glass of wine
- A 12-ounce bottle or can of wine cooler
- A shot of liquor straight or in a mixed drink

1. Think back over the last two weeks. How many times have you had five or more drinks in a row? (Choose one answer)
   - None
   - Once
   - Twice

2. During the last two weeks, how many times have you had four drinks in a row (but no more than that)? (Choose one answer)
   - None
   - Once
   - Twice

If you answered “None” to both questions 1 and 2, then skip to question 10.

3. What type of alcohol did you usually have on those occasions when you had four or more drinks in a row? (Choose one answer)
   - Beer
   - Wine
   - “Low alcohol” beer
   - Liquor (or mixed drinks)
   - Wine coolers
   - No “usual” drink

4. The last time that you had four or more drinks in a row, how many drinks did you actually have? (Choose one answer)
   - 4 drinks
   - 5 drinks
   - 6 drinks
   - 7 drinks
   - 8 drinks
   - 9 drinks
   - 10-14 drinks
   - 15 or more drinks

5. On how many occasions have you had a drink of alcohol in the past 30 days? (Choose one answer)
   - 1 to 2 occasions
   - 3 to 5 occasions
   - 6 to 9 occasions
   - 10 to 19 occasions
   - 20 to 39 occasions
   - 40 or more occasions

6. In the past 30 days, on those occasions when you drank alcohol, how many drinks did you usually have? (Choose one answer)
   - 1 drink
   - 4 drinks
   - 7 drinks
7. In the past 30 days, how often did you drink enough to get drunk? (By drunk, we mean unsteady, dizzy, or sick to your stomach.) (Choose one answer)
   - □ Not at all
   - □ 1 to 2 occasions
   - □ 3 to 5 occasions
   - □ 6 to 9 occasions
   - □ 10 to 19 occasions
   - □ 20 to 39 occasions
   - □ 40 or more occasions

8. In the past 30 days, how many drinks did you have the last time you attended any of the following events? (Choose one answer in each row)

<table>
<thead>
<tr>
<th>Event</th>
<th>Didn’t attend</th>
<th>No drinks</th>
<th>1 or 2 drinks</th>
<th>3 drinks</th>
<th>4 drinks</th>
<th>5 or more drinks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residence hall social event or party</td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>Fraternity/sorority event or party</td>
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<tr>
<td>On-campus concert</td>
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<tr>
<td>Intercollegiate home athletic event</td>
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<tr>
<td>Intercollegiate away athletic event</td>
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<tr>
<td>On-campus pub (e.g., The Cellar)</td>
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<tr>
<td>Off-campus party</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Off-campus bar or club</td>
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</tr>
</tbody>
</table>

9. How easy is it for you to obtain alcohol? (Choose one answer)
   - □ Very difficult
   - □ Very easy
   - □ Difficult
   - □ Don’t know, I don’t drink
   - □ Easy

Theory of Planned Behavior Constructs

Please circle the number that best reflects you.

10. I intend to drink four or more standard alcoholic beverages in a single session in the next two weeks.
    Very unlikely  Very likely
    1  2  3  4  5  6  7

11. I _______ drink four or more standard alcoholic beverages in a single session in the next two weeks.
    Do intend to  Do not intend to
    1  2  3  4  5  6  7
<table>
<thead>
<tr>
<th>Question</th>
<th>Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Do you intend to drink four or more standard alcoholic beverages in a single session in the next week?</td>
<td>Definitely intend to 1 2 3</td>
</tr>
<tr>
<td>13. If I drink four or more standard alcoholic beverages in a single session in the next two weeks, most people who are important to me would:</td>
<td>Strongly approve 1 2 3</td>
</tr>
<tr>
<td>14. Most people important to me think that my drinking four or more standard alcoholic beverages in a single session in the next two weeks would be:</td>
<td>Undesirable 1 2 3</td>
</tr>
<tr>
<td>15. Most others who are important to me think that I ____________ drink four or more standard alcoholic beverages in a single session in the next two weeks.</td>
<td>Should 1 2 3</td>
</tr>
<tr>
<td>16. For me to drink five or more standard alcoholic beverages in a single session in the next two weeks would be:</td>
<td>Very difficult 1 2 3</td>
</tr>
<tr>
<td>17. If I wanted to, it would be easy for me to drink five or more standard alcoholic beverages in a single session in the next two weeks.</td>
<td>Strongly agree 1 2 3</td>
</tr>
<tr>
<td>18. For me to drink less than five standard alcoholic beverages in a single session in the next two weeks would be:</td>
<td>Very Difficult 1 2 3</td>
</tr>
<tr>
<td>19. If I wanted to, I could drink less than five standard alcoholic beverages in a single session in the next two weeks.</td>
<td>Definitely false 1 2 3</td>
</tr>
<tr>
<td>20. How much control do you believe you have over drinking less than five standard alcoholic beverages in the next two weeks?</td>
<td>No control 1 2 3</td>
</tr>
<tr>
<td>21. Think about your friends and peers at UW-L. How much would they agree that drinking five or more standard alcoholic beverages in a single session in the next two weeks is a good thing to do?</td>
<td>Agree completely 1 2 3</td>
</tr>
<tr>
<td>22. How many of your friends and peers at UW-L would think that drinking five or more standard alcoholic beverages in a single session in the next two weeks is a good thing to do?</td>
<td>None 1 2 3</td>
</tr>
<tr>
<td>23. How many of your friends and peers at UW-L would drink five or more standard alcoholic beverages in a single session in the next two weeks?</td>
<td>None 1 2 3</td>
</tr>
<tr>
<td>24. Think about your friends and peers at UW-L. What percentage of them do you think would drink five or more standard alcoholic beverages in a single session in the next two weeks?</td>
<td>0% 1 2 3</td>
</tr>
</tbody>
</table>
25. How much do you feel you identify with your friends and peers at UW-L?  
Not very much  Very much  
1 2 3 4 5 6 7

26. With respect to your general attitudes and beliefs, how similar do you feel you are to your friends and peers at UW-L?  
Very dissimilar  Very similar  
1 2 3 4 5 6 7

27. Think about who you are. How important is being a member of your group of friends and peers at UW-L?  
Very important  Very unimportant  
1 2 3 4 5 6 7

28. How much do you feel strong ties with your friends and peers at UW-L?  
Very much  Not very much  
1 2 3 4 5 6 7

29. In general, how well do you feel you fit into your group of friends and peers at UW-L?  
Not very well  Very well  
1 2 3 4 5 6 7

30. How much do you see yourself belonging to your group of friends and peers at UW-L?  
Not very much  Very much  
1 2 3 4 5 6 7

31. What is your attitude towards binge-drinking? Circle the most appropriate of the word pairs.  
Unenjoyable / Enjoyable  Bad / Good  Favorable / Unfavorable  
Unpleasant / Pleasant  Satisfying / Unsatisfying

**Demographics**

32. How old are you? (Choose one answer)

☐ 18  ☐ 22  
☐ 19  ☐ 23  
☐ 20  ☐ 24  
☐ 21  ☐ 25 or older  

33. What is your gender?

☐ Male  
☐ Female  
☐ Transgender

34. What is your current year in school? (Choose one answer)

☐ Freshman (1st year)  
☐ Sophomore (2nd year)  
☐ Junior (3rd year)  
☐ Senior (4th year)  
☐ 5th year or beyond (undergraduate)
35. Where do you currently live? (Choose one answer)

☐ Campus residence hall
☐ Fraternity or sorority house
☐ Other college/university housing
☐ Parent/guardian’s home
☐ Other off-campus housing
APPENDIX C
INFORMED CONSENT
Informed Consent

Protocol Title: College Students’ Binge Drinking Behaviors: Exploring Factors Affecting Alcohol Consumption at UW-L through the Theory of Planned Behavior

Principal Investigator: Jenna Willems, BS, MPH Candidate
Research Contact: Dr. Michele Pettit, MPH
207 Mitchell Hall
608-785-6789

Purpose and Procedure
The purpose of this research is to gain an understanding of the alcohol consumption behaviors of University of Wisconsin-La Crosse (UW-L) students and the factors related to consumption in relation to the Theory of Planned Behavior. The results will be disseminated to college administrators and local groups such as the Changing the Culture of Risky Drinking Behavior Coalition. Results also may be presented and/or published.

In the following questionnaire, you will be asked to answer questions related to your personal alcohol consumption behaviors, your perceptions on alcohol use/peer alcohol use, and brief demographic information.

Potential Risks
Risks for involvement in this research study are minimal. However, if you choose to participate and feel uncomfortable answering any of the questions, you may skip or discontinue participation at any time.

Benefits
By completing this questionnaire, you may gain a better understanding of your personal alcohol consumption behaviors and reflect on the impact of your peers. In addition, through your participation, it is hoped that this research will allow professionals to understand the alcohol consumption practices on and off campus and how to approach harm reduction efforts related to alcohol use.

Rights and Confidentiality
Your participation is completely voluntary. You may withdraw or refuse to participate at any time without consequences. All data obtained from participants will be anonymous. There will be no personally identifiable information on the questionnaire. Please do not write your name on the questionnaire.

By completing this questionnaire, you are acknowledging that you are 18 years of age or older and consenting to participate in this research. This questionnaire is only to be completed one time per student.
Questions about the Research or Your Right as a Research Participant
If you have questions regarding this study, please do not hesitate to contact me, Jenna Willems, at 952-210-9501 or willems.jenn@uwlax.edu, or the study advisor, Dr. Michele Pettit, UW-L Health Education and Health Promotion Department, at 608-785-6789 or mpettit@uwlax.edu. Questions regarding the protection of human subjects may be addressed to the UW-L Institutional Review Board at 608-785-8124 or irb@uwlax.edu.
APPENDIX D

ASSUMPTIONS, DELIMITATIONS, & DEFINITIONS OF TERMS
Assumptions

It was assumed that all participants answered the questionnaire openly, honestly, and to the best of their ability. Accuracy and sufficient recall also were assumed as the questionnaire was designed to focus on events that occurred no longer than the past 30 days. It also was assumed that a proportion of the subjects regularly participated in risky drinking behaviors. A final assumption was made that each participant only completed the questionnaire one time.

Delimitations

This research was focused solely on college students enrolled at the University of Wisconsin-La Crosse, specifically undergraduate students. The population was delimited to college students from this University as recent data on binge drinking prevalence and practices at UW-L had not been gathered, unlike other nearby institutions. As a final delimitation to this research study, participation was not offered to all undergraduate students and thus, a convenience sample of classrooms was utilized.

Definitions of Terms

Alcoholic Drink Standard: in this study is defined as one bottle of beer (12 oz.), a glass of wine (4 oz.), a wine cooler (12 oz.), or a shot of liquor (1 oz.) served straight or mixed in a beverage (Ross & Jackson, 2013).

Alcohol Outlet Concentration: “A significant number of alcohol outlets within a small defined area in comparison to other measures” (WDHS, 2012, p. 8).

Attitude: as a construct in the TPB, refers to the strength of the favorable or unfavorable valuation of alcohol consumption (Ross & Jackson, 2013).
**Behavioral Intention:** is a construct of the TPB and refers to the likelihood of participating in binge drinking (U.S. Department of Health and Human Services, National Cancer Institute, 2005).

**Blood Alcohol Content (BAC) Level:** in this study, is the amount of alcohol in a person’s bloodstream based on number of drinks consumed, time period of consumption, weight, and gender; where 0.08 is considered legal intoxication (Wisconsin Department of Transportation, 2014).

**Binge Drinking:** in this study is a common pattern of excessive drinking that brings a person’s BAC to 0.08 grams percent or above; binge drinking typically occurs when men consume five or more drinks and when women consume four or more drinks, in approximately two hours (NIAAA, 2004).

**Blackout or “Blacking Out:”** in this study refers to a consequence of excessive alcohol consumption in which there is a period of time when alcohol was consumed and an individual cannot remember all parts of the drinking occasion; blackout or blacking out also is known as anterograde amnesia or acute-induced memory dysfunction (LaBrie, Hummer, Kenney, Lac, & Pedersen, 2011).

**Heavy Drinking:** in this study is the average consumption of 2 or more alcoholic beverages a day, or 15 or more per week, for men, and 1 or more alcohol beverages a day, or 8 or more per week, for women (CDC, 2013).

**Excessive Alcohol Consumption:** in this study refers to any of the following behaviors: binge drinking, heavy drinking, alcohol consumption by those under the legal drinking age of 21, and alcohol use by pregnant women (CDC, 2013).
**Perceived Behavioral Control (PBC):** in this study, as a construct of the TPB, refers to the belief an individual has over the control of binge drinking (or abstaining from binge drinking) or over the intensity of binge drinking (U.S. Department of Health and Human Services, National Cancer Institute, 2005).

**Pregaming:** in this study is the consumption of alcohol prior to attending an event or activity (e.g., party, bar, concert) at which more alcohol may be consumed (Pedersen & LaBrie, 2007).

**Self-efficacy:** in this study refers to the perceived confidence to successfully participate in binge drinking (Ross & Jackson, 2013).

**Serious Binge Drinking:** in this study consists of three or more binge drinking episodes in the last two weeks.

**Social Belonging:** in this study is the feeling of inclusion, identification, and connectedness with friends or a peer group.

**Subjective Norm:** in this study, as a construct of the TPB, refers to the perceived social pressure, perceived social expectations, and social standards surrounding drinking behavior, and perceptions of approval from significant others (e.g., peers, teachers, parents, siblings) regarding drinking behavior (Ross & Jackson, 2013).