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Coping, Conforming, and Liquid Courage as Predictors of Binge Drinking Among Female College Students

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Abstract

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by

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MA, Argosy University

MA, George Mason University

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Health Psychology

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Abstract

College-student binge drinking presents a significant health problem on college campuses. Binge drinking has typically been associated with male college students. The rate of binge drinking (4 or more alcoholic drinks on a single occasion) for female college students increased from 46% in 1991-1992 to 52% in 2011-2012. Female alcoholics are more vulnerable to high risk of liver disease, circulatory disorders, breast cancer, fertility issues, and early menopause. Given these risks and increases in the rate of female college student binge drinking, there is a need to identify motivations for/expectations from binge drinking among females. Using the foundation of social learning theory, the purpose of this quantitative survey study was to examine the possible predictive factors for binge drinking. Motives and expectancies included drinking to cope with negative internal moods (i.e., coping), drinking to conform, and drinking with a positive expectancy of "liquid courage." Measurement instruments included the Alcohol Use Disorders Screening Test, Drinking Motives Questionnaire, and Comprehensive Effects of Alcohol. Participants included 244 female college students who consumed alcohol. Results from multiple regression revealed that coping and liquid courage were significant predictors of binge drinking. Conforming was not a significant predictor of binge drinking. The identification of these 2 binge-drinking risk factors provides useful information for effective female-binge-drinking awareness programs. By increasing understanding of the motives behind binge drinking and identifying healthy alternatives to drinking alcohol to cope with stress or gain courage, this study may assist those seeking to curtail the rise in female binge drinking on college campuses.

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Dedication

This dissertation is dedicated to my past, current, and future counseling clients.

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Chapter 1: Introduction to the Study

Introduction

College-student binge drinking presents a significant health problem on college campuses. Binge drinking is a pattern of alcohol use that raises an individual's blood alcohol concentration (BAC) to .08% or above (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2004). *Binge drinking* is defined as four or more drinks during a single occasion for women, and five or more drinks during a single occasion for men, and *heavy alcohol use* is defined as drinking eight or more drinks per week for women and 15 or more drinks for men (Centers for Disease Control and Prevention [CDC], 2018). Drinking too much, including binge drinking, cost the United States $249 billion in 2010, or $2.05 a drink, in losses in productivity, health care, crime, and other expenses (CDC, 2017). Binge drinking was responsible for 77% of these costs, or $191 billion (Sacks, Gonzales, Bouchery, Tomedi, & Brewer, 2015).

About 90% of alcohol consumption by youth under the age of 21 in the United States is the form of binge drinking (Office of Juvenile Justice and Delinquency Prevention, 2005). Accordingly, national surveys have reported a high incidence of binge drinking on college campuses (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014b). The National Survey on Drug Use and Health (NSDUH) found that 38% of young adults (i.e., individuals 18 to 25 years of age) reported having engaged in binge drinking and 11% reported heavy alcohol use within the previous month, indicating a major public health concern. Excessive alcohol use can result in major short-term health effects including blackouts, passing out, and alcohol

overdose (White & Hingson, 2013). Further, White, Hingson, Pan, and Yi (2011) found that 29,372 young adults (19,847 males and 9,525 females), 33% of whom were college students, were hospitalized for alcohol overdose in 2008.

In addition to health emergencies, alcohol use has a negative impact on college students' academic performance and future outcomes. Twenty-five percent of college students report difficulties associated with alcohol use, including missed classes, falling behind, poor grades on exams or projects, and lower grades overall (Wechsler et al., 2002). Binge-drinking college students are also more likely to drop out of college, work in less prestigious jobs, and be dependent on alcohol 10 years after reporting their binge drinking (Jennison, 2004).

Background

Previous research indicates that individual alcohol use among college students is related to peers' use of alcohol (White & Hingson, 2013) and perception of alcohol-use-related rewards (Durkin, Wolfe, & Clark, 2005). However, less is known about associations between motives, expectancies, and the drinking behaviors of individual college females specifically. Although binge drinking has typically been associated with male college students (Wechsler et al., 2002), the rate of binge drinking among college females is increasing (Grucza, Norberg, & Bierut, 2009). The percentage of college females who engaged in binge drinking increased from 46% in 1991-1992 to 52% in 2011-2012 (Hensel, Todd, & Engs, 2014). Binge drinking among college females also yields gender-specific public health concerns: (a) female alcoholics have higher death rates than male alcoholics, and (b) chronic alcohol abuse in women is associated with

high risk of liver disease, circulatory disorders, breast cancer, fertility issues, and early menopause (Kelly-Weeder, 2008).

Given the high rates of binge drinking on campus and the gender-specific health risks for female students, it is important to explore motivations and expectancies for binge drinking among female college students. First, female college students may drink to reduce negative feelings such as anxiety, depression, or unease (Kelly-Weeder, 2008), so another binge drinking risk factor is drinking to cope with negative internal moods (LaBrie, Hummer, & Pederson, 2007). Furthermore, research has indicated that social motives (e.g., drinking to conform, or to avoid alienation) and positive alcohol-related expectancies (e.g., drinking with a positive expectancy of liquid courage, or feeling brave/daring after consumption of alcohol) are risk factors for binge drinking among females **(**Cooper, 1994; Fromme, Stroot, & Kaplan, 1993; LaBrie et al., 2007; Strano, 2004).

However, there are very few studies that address gender-specific motivations for/expectations from binge drinking. In other words, little of the extant literature investigates how college females may use alcohol for reasons different from those of college males. This study addressed this gap, examining the possible predictive factors for binge drinking among female college students and providing more information on which motives influence college females' binge-drinking behavior. The motives and expectancies considered in this study were as follows: (a) drinking to cope with negative internal moods (i.e., coping); (b) drinking to conform (i.e., conforming); and (c) drinking with a positive expectancy of liquid courage (i.e., liquid courage).

Furthermore, previous research has found a need for gender-specific interventions to reduce risky drinking behaviors (Hensel, Todd, & Engs, 2014). This study responds to that recommendation: Collecting data on how motives/expectancies influence binge-drinking behavior among college females can point up risk factors for excessive alcohol use. In turn, by identifying risk factors, it may be possible to equip college administrators and educators, psychologists, medical staff, policymakers, and substance abuse counselors with information needed to tailor binge-drinking interventions to college females.

The study promotes positive social change for the college female population by increasing knowledge about motives that increase the likelihood of binge-drinking behavior. Because 39% of females aged 18-25 engage in binge-drinking behavior, insight into factors that motivate binge drinking would benefit this population (SAMHSA, 2013). This study may generate further positive social change by apprising college administrators and healthcare professionals of high-risk factors that promote college females' binge drinking. In Chapter 1, I illustrate relevant gaps in the literature, state the research problem, summarize the theoretical framework of this study, list the research questions and hypotheses, operationally define the variables, describe the assumptions/scope/limitations, and discuss the significance of the study.

Problem Statement

The spike in binge-drinking behavior among college females is alarming (Johnston, O'Malley, Bachman, & Schulenberg, 2012). In 1975, surveys found a 23-percentage-point difference between male and female college students who self-reported

having consumed 5 or more drinks in one sitting; in 2009, there was only a 10-point difference, with the number of females having risen dramatically (Johnston et al., 2012). Binge drinking among college students results in a heightened risk of negative outcomes such as (a) falling behind in school work, (b) regretting an act while drinking, (c) experiencing a blackout, (d) police involvement, (e) engaging in unplanned sex, and/or (f) driving under the influence (White & Hingson, 2013). College females are increasingly engaging in binge-drinking behavior, indicating that alcohol use is problematic in female college students and justifying research into gender-specific predictive factors in binge-drinking (Linden, Lau-Barraco, & Milletich, 2014).

Past research on the increase in binge drinking among college women revealed the following patterns: (a) female college students were more likely to drink heavily in their freshman and sophomore years; (b) 50% of sorority members reported binge drinking in the 2 weeks prior to being study participants; and (c) female students may drink to reduce negative feelings such as anxiety, depression, or unease (Kelly-Weeder, 2008). Although patterns in drinking behavior among college females have been identified, there is a paucity of studies of gender-specific motives/expectancies associated with binge-drinking behavior, leaving a gap in the research. For example, few studies have explored the links between negative drinking motives/positive expectancies and binge drinking among college females (e.g., Linden et al., 2014). Furthermore, although Linden et al. (2014) did explore certain positive expectancies (e.g., positive affect), other positive expectancies (e.g., liquid courage) were left unexamined. This study has the potential to build upon the extant literature and fill in research gaps by examining the

influence of underexplored negative drinking motives (i.e., coping, conforming) and unexplored positive expectancies (i.e., liquid courage) on binge-drinking behavior among college females.

Purpose of the Study

This study was a quantitative survey designed to determine motives predictive of binge-drinking behavior among college females. Understanding how motives/expectancies influence binge-drinking behavior among college females will inform binge-drinking intervention and prevention efforts on college campuses. This study explored the relationships between (a) coping (independent variable [IV]), (b) conforming (IV), (c) liquid courage (IV), and binge drinking (dependent variable [DV]) among female college students.

Research Questions and Hypotheses

The following research questions and hypotheses addressed how predictive certain factors are of binge drinking among female college students.

Research Question 1: Is coping, as measured by the coping drinking motive subscale of the Drinking Motives Questionnaire (DMQ-R SF), a predictor of binge drinking among college females, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C).

$H_0$1: Coping is not a significant predictor of binge drinking among college females.

H_a1: Coping is a significant predictor of binge drinking among college females.

Research Question 2: Is conforming, as measured by the conformity drinking motive subscale of the Drinking Motives Questionnaire (DMQ-R SF), a predictor of binge drinking among college females, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C).

$H_0$2: Conforming is not a significant predictor of binge drinking among college females.

H_a2: Conforming is a significant predictor of binge drinking among college females.

Research Question 3: Is liquid courage, as measured by the liquid courage alcohol expectancy subscale of the Comprehensive Effects of Alcohol (CEOA), a predictor of binge drinking among college females, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C).

$H_0$3: Liquid courage is not a significant predictor of binge drinking among college females.

H_a3: Liquid courage is a significant predictor of binge drinking among college females.

Theoretical Framework

Bandura's (1973) social learning theory (SLT) served as the theoretical framework for this study. SLT suggests that behavior is learned from observations of others in social settings. Social norms are learned by observing peers, in that an observer is likely to copy observed behaviors that lead to positive outcomes. The elements of SLT (e.g., social reinforcement, modeling, and cognitive processes) explain how college peers

can influence individual alcohol use (Borsari & Carey, 2005). Social reinforcement of drinking behavior occurs when there is acceptance or encouragement of drinking. Modeling occurs when students observe drinking behaviors by their peers. Behaviors leading to positive outcomes (e.g., drinking behavior) create the perception that drinking is normal and acceptable. Individual cognitive processes convert the perceptions or mental constructs into modeled behaviors. Because college is a time of increased social activity where alcohol is present, college students are frequently exposed to alcohol and engage with peers who model high-alcohol-use behaviors (Borsari & Carey, 2005). Peer and individual binge-drinking behavior is reinforced by a student's social activities and friendships (Borsari & Carey, 2005; Fearnow-Kenny, Wyrick, Hansen, Dyreg, & Beau, 2001). SLT predicts a strong association between peer drinking behaviors and individual drinking behaviors, as these behaviors are frequently reinforced in the social environment in college (Bonsari & Carey, 2005; Fearnow-Kenny et al., 2001). The present study hypothesized that conformity is a reason for increased binge drinking among college females. SLT provides a theoretical foundation for alcohol-use norms and engagement in risky behavior (Durkin et al., 2005). Chapter 2 provides a more detailed explanation of SLT as suitable for this study.

Nature of the Study

A quantitative research approach was appropriate for this study because the research questions examined the relationship between the dependent variable and the independent variables. A quantitative survey research design was appropriate to address the research questions because the information gathered would be quantified by

numerical data and statistically analyzed. The research questions required that the design provide quantifiable data that could be analyzed to explore significance in relationships among the variables. In this quantitative survey research design, the research questions were designed to determine whether there is a relationship between the predictor (independent) variables and the outcome (dependent) variable. The dependent variable for this study was binge drinking (i.e., four or more drinks for females in one sitting or five or more drinks for males in one sitting; CDC, 2018). There were three independent variables for this study: coping (i.e., drinking in order to decrease negative internal moods; LaBrie et al., 2007); conforming (i.e., drinking to fit in or avoid social rejection; Cooper, 1994); and liquid courage (i.e., drinking to feel brave and daring; Fromme et al., 1993).

Similar studies have successfully employed this approach in examining college alcohol use. Lienemann and Lamb (2013) designed a quantitative survey approach to examine whether alcohol expectancies and self-efficacy influenced heavy episodic drinking in college females. DeMartini and Carey (2009) used a quantitative survey design study to assess alcohol-use patterns and concomitant health issues among college students.

The chosen sample for this study, undergraduate female college students enrolled at George Mason University, was appropriate in that the research questions pertained to binge-drinking behaviors of college females. The sampling frame and convenience nonprobability sampling approach was used to recruit adult females enrolled at a mid-Atlantic public state university who responded to an electronic message posted by the

psychology department research coordinator. Participants initiated participation by clicking a link in the message to the Survey Monkey survey tool. The participants read a brief description of the study, an informed consent statement, and assurances of confidentiality and anonymity before completing the survey.

The descriptive and inferential (descriptive statistics and multiple regression) analysis selected for this study was appropriate because it would demonstrate any significant linear relationships between the dependent variable and any of the three independent variables.

Descriptive statistics were conducted on the sample demographics. Means and standard deviations wre calculated for continuous data including age, frequency of binge drinking (i.e., less that monthly, monthly, weekly, daily/almost daily), and typical number of drinks consumed in a drinking episode (i.e., 1 or 2; 3 or 4; 5 or 6; 7, 8, or 9; 10 or more). Numerical and visual outputs from SPSS for Mac displayed any significant linear relationships between the dependent variable and any of the three independent variables. Inferential analysis of the research questions were conducted by a multiple regression to examine the relative strength of the predictor variables (X) and the outcome variable (Y). Assumptions of the regression were tested to verify a linear relationship between variables, normality in the variables, multicollinearity, no autocorrelation, and homoscedasticity.

Similar studies successfully employed these statistical and analytic methods to answer their research questions. Lienemann and Lamb (2013) asked whether (a) alcohol expectations, (b) consequences, and (c) use of drinking-refusal strategies (IVs) predict

college females engaging in heavy episodic drinking (HED). Participants completed the Comprehensive Effects of Alcohol (CEOA), Cognitive Appraisal of Risky Events, and Drinking Context Convivial Drinking scales as well as self-efficacy, alcohol use, and demographic items. Descriptive statistics and logistic and linear regression analyses were performed on the data collected to answer the research questions. In DeMartini and Carey's (2009) study assessing alcohol-use patterns and health issues, participants completed a demographic information survey, the Alcohol Use Disorders Identification Test (AUDIT), the Short Form Health Survey, and the Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ) to indicate whether there were relationships between high alcohol consumption (DV) and other demographic and health variables (IVs). The researchers performed descriptive statistics and linear regression models to assess the research questions. Furthermore, the research designs of Lienemann and Lamb (2013) and DeMartini and Carey (2009) provided a rationale for employing the quantitative methodology employed in this study.

Definitions

Standard drink: Quantity of drink that contains 0.6 ounces of pure alcohol, as in 12 ounces of beer, 8 ounces of malt liquor, 5 ounces of wine, or 1.5 ounces of 80-proof distilled spirits or liquor (e.g., gin, rum, vodka, whiskey; CDC, 2018).

Heavy alcohol use: Alcohol consumption of eight or more drinks per week for women or 15 or more drinks for men (CDC, 2018).

Binge drinking: Alcohol consumption of four or more drinks during a single occasion for women, and five or more drinks during a single occasion for me (CDC, 2018).

Drinking motives: The different needs or functions that drive drinking behavior (Cooper, 1994).

Drinking expectancy: An individual's beliefs concerning a result of drinking alcohol that influence how often and how much the individual drinks (Fromme et al., 1993).

Drinking to cope with negative internal moods (i.e., *coping*): A drinking motive to consume alcohol in order to reduce or regulate negative emotions (Cooper, 1994).

Drinking to conform or avoid alienation (i.e., *conforming*): A drinking motive to consume alcohol in order to avoid social censure or rejection (Cooper, 1994).

Drinking with the positive expectancy of liquid courage (i.e., *liquid courage*): A drinking expectancy that one will feel brave and daring after drinking alcohol (Fromme et al., 1993).

Assumptions

This study involved the assumption that participants might be able to understand or recall the reasons or beliefs that informed their alcohol consumption. It was assumed that these beliefs affected alcohol-use behavior. This study also involved the assumption that the participants would be truthful in their responses to survey questions. All measures used in this study were self-report. It was assumed that the description of the study, the assurance of confidentiality and anonymity, and the phrasing of the questions

would encourage honest responses. Further, it was assumed that the instruments used to quantify the variables would accurately measure coping, conforming, and liquid courage as factors (IVs) related to binge drinking among female college students. It was also assumed that the instrument used to quantify the variables would accurately measure binge drinking (DV) among female college students.

Scope and Delimitations

The research questions addressed factors that may influence binge-drinking behaviors among female college students specifically. In addition, this study included only female college students who had consumed alcohol. The target population was selected due to the recent increase in female binge drinking. Existing studies indicated that characteristics associated with binge-drinking behaviors may be different for females than for males (Grucza, Norberg, & Bierut, 2009; Kelly-Weeder, 2008). Toward that end, the sampling frame of this study targeted only female adult undergraduate students. The population frame was guided by gaps in recent literature. Because this sample was limited to female undergraduate students, the results are not generalizable to all young adult females but only to female undergraduate students. Social learning theory provides a theoretical framework for exploring binge-drinking behaviors as influenced by peer and alcohol-use norms.

Limitations

The survey design of this study assumed participant veracity, but wittingly or unwittingly, participants may not have correctly estimated their alcohol-use quantities. To encourage correct estimations, a chart displaying alcohol serving sizes aided the

participants in reporting correctly. Questions about social interactions may prompt participant responses that fall prey to social desirability pressures (Borsari & Carey, 2006; Durkin et al., 2005). Response confidentiality may mitigate these pressures.

Significance

The findings of this research provide insight into reasons why female college students engage in binge-drinking behavior. The quantitative design showed whether there is a significant relationship between coping, conforming, or liquid courage and binge-drinking behavior. These findings have the potential to increase understanding of why binge drinking is increasing among college females. By informing educators and policymakers, this knowledge may be used to create effective prevention and/or intervention strategies and, thereby, address the U.S. Surgeon General's call to reduce heavy alcohol use among college students (Department of Health and Human Services [DHHS], 2000). The research aims to contribute to positive social change by providing useful information to the target population, college females, to address and minimize the many problems associated with binge drinking.

Summary

Binge drinking is a behavior typified by excessive alcohol consumption (i.e., females consuming four or more drinks in a single session, males consuming five or more drinks in a single session) (CDC, 2018). Increased alcohol use is an expensive public health concern and can result in health emergencies (White & Hingson, 2013; White, Hingson, Pan, & Yi, 2011). College females are engaging in binge drinking at increased rates (Grucza, Norberg, & Bierut, 2009), and the social settings of colleges provide

numerous drinking opportunities (Bonsari & Carey, 2005). Social learning theory provides a theoretical foundation to explain how the social environment influences individual drinking behaviors (Bonsari & Carey, 2005). A quantitative survey design determined which factors may motivate college females to engage in binge-drinking behaviors. Understanding of these factors will aid in intervention and prevention efforts for college campuses, health care professionals, and policymakers to reduce binge drinking. Chapter 2 provides both a literature review and a detailed theoretical framework that informs/contextualizes the variables addressed by the research questions. Gaps in the literature pertaining to the variables of interest are identified to justify the need for this study.

Chapter 2: Literature Review

Introduction

The epidemic of binge drinking on college campuses has captured even the attention of the Office of the U.S. Surgeon General, which has set a goal of curbing it (DHHS, 2000). This binge-drinking epidemic has been particularly pronounced among college females (Grucza, Norberg, & Bierut, 2009), resulting in risky sexual behaviors and concomitant poor scholastic performance within that population (Lanza-Kaduce, Capece, & Alden, 2006). Binge drinking is defined as five or more drinks on the same occasion on at least one day in the past 30 days, and heavy alcohol use is defined as drinking this same quantity (five or more drinks) on five or more days in the past 30 days (NIAAA,n.d.). The purpose of this quantitative study was to identify and examine factors that may contribute to binge drinking in college females. Comprehension of motivations, social influences, and patterns related to binge drinking among college females can inform effective interventions.

Chapter 2 underpins the examination of factors that contribute to binge drinking behavior among college females. This chapter provides a review of the relevant literature, including the theory that informs the present research questions and gaps in the existing research. Bandura's (1973) social learning theory served as the theoretical framework for this study. The literature review begins by describing patterns and statistics related to alcohol abuse and binge drinking on college campuses. Next, the increase of female binge drinking in college, along with its consequences, is reviewed. In order to understand the spike in binge-drinking behavior, (a) motives for drinking and (b) alcohol

expectancies are reviewed. Each section of the literature review addresses a research variable and identifies gaps in exploring/documenting college females' motivations for binge drinking.

Literature Search Strategy

Research articles compiled in this review were accessed through Walden University's EBSCOhost, Thoreau, and the Walden University Library. Databases searched were PsycINFO, PsycARTICLES, Academic Search Complete, and MEDLINE. The Google Scholar database was used to access both some sources and published statistics from the National Institute on Alcohol Abuse and Alcoholism (NIAAA), Department of Health and Human Services (DHHS), Centers for Disease Control (CDC), and Substance Abuse and Mental Health Services Administration (SAMHSA). Searches targeted peer-reviewed articles from the years 2000 to 2015.

Search keywords used in the Walden University Library, EBSCOhost, and Google Scholar included the following (combinations of the following): *alcohol use*, *binge drinking*, *college*, *university*, *female*, *women*, *motives*, *motivation*, *reason*, *intent*, *intentions*, *expectancy*, *expectancies*, *belief*, and *social learning theory*.

The literature review emphasizes peer-reviewed research from the past 10 years. Several publications predate that because they give context and establish the prevalence and patterns of alcohol use on college campuses. Seminal sources on social learning theory are referenced.

Theoretical Foundation

Social Learning Theory

Social learning theory (SLT) posits that behavior is learned through observations of others in social settings (Bandura, 1973). The observer may be likely to copy/repeat observed behaviors that lead to positive outcomes. Conversely, observed behaviors that lead to negative outcomes are not likely to be copied/repeated. Social norms are learned by observing socializing agents (e.g., peers).

The elements of SLT (e.g., social reinforcement, modeling, and cognitive processes) illustrate how college peers can influence individual alcohol use (Bonsari & Carey, 2005). Social reinforcement of drinking behaviors occurs when there is acceptance or encouragement of drinking, such as at a party. Modeling occurs when students observe behaviors by others. Peers demonstrate how college students use alcohol; the student observes reactions to the drinking behavior, and if reaction/reinforcement is positive, the observer will likely drink as well. Behaviors leading to positive outcomes (e.g., drinking behavior) create the perception that drinking is normal and acceptable. Individual cognitive processes convert these thoughts/mental constructs into overt behaviors. Cognitive processes can then be reinforced or undermined by the college student's subsequent social environments or experiences. College students frequently engage in cognitive processing in relation to alcohol expectancy and/or drinking outcomes (Werner, Walker, & Greene, 1996).

SLT can help explain excessive drinking behavior when alcohol use is integral to peer interaction (Bonsari & Carey, 2005). In college environments where alcohol use is

present, accepted, and encouraged, friendships may develop around alcohol-use events. Students may drink heavily to improve their social situation or standing, gain peer acceptance, and cultivate peer intimacy; realizing those objectives may lead students to seek subsequent interactions that involve high alcohol use. Friendships may be reinforced or additional friendships formed during these subsequent drinking experiences, positively reinforcing the behavior. Highly esteemed peers are likely to be more influential than strangers or acquaintances. In college, alcohol-use events are bonding events where social bonding reinforces friendships. The esteemed peers model excessive drinking behavior, making it more likely that the excessive drinking behavior will be copied (Bonsari & Carey, 2005).

SLT has proven to be a useful framework in other studies examining college drinking. Participation in team sports affected the drinking behaviors of female college athletes: Peer relationships and companionship are essential to teamwork, and team activities lead to team cohesion (Zamboanga, Rodriguez, & Horton, 2008). Risky drinking behaviors tend to increase if student athletes observe alcohol use as acceptable and expected in team settings. Zamboanga et al. (2008) hypothesized that a higher frequency of team social events would result in elevated alcohol use by the athletes. Participants were 189 female athletes from a northeastern college who completed the following self-report questionnaires: (a) Alcohol Use Disorders Screening Test (AUDIT), which measures elevated alcohol use; (b) question concerning whether the participant had ever participated in a drinking game with teammates; (c) question concerning the frequency of team social events with alcohol; and (d) Group Environment Questionnaire

(GEQ), which assesses group cohesion. Collected data were grouped by specific club sport (i.e., ultimate frisbee, ice hockey, rugby, swimming, softball, soccer, crew) to examine whether the drinking behaviors were sport specific. Findings revealed that social influences (e.g., team events involving alcohol) increased alcohol use among female college athletes. Because there were cross-team differences in drinking behaviors (i.e., some teams reported more drinking than other teams), certain teams may influence alcohol use more than others. Therefore, an SLT model indicates that individual athletes may conform to team drinking norms. In addition, the higher the reported frequency of team social events involving alcohol, the higher the reported individual use of alcohol. This supports the SLT principle that normative alcohol use influences individual drinking behavior.

Ward and Gryczynski (2009) applied SLT to college student living arrangements (e.g., on- or off-campus) to ascertain whether peer and/or family alcohol-use norms had effects on binge drinking. Using data from the 2001 Harvard School of Public Health College Alcohol Study, which surveyed full-time undergraduate students in the United States, Ward and Gryczynski plugged student living arrangements and social norms variables into regression models to predict binge drinking. Results of the study showed that social norms and on-campus living arrangements of college students were significant predictors of excessive alcohol use.

Britton (2004) applied SLT to cognitive processes, speculating that (a) alcohol consumption is a coping strategy for drinkers who hold positive expectancies about the effects of alcohol and (b) college students who frequently observe peers using substances

to cope may themselves be more likely to use alcohol to cope. Study participants were 196 undergraduate students who had consumed alcohol in the previous month and completed self-report questionnaires, including (a) the COPE questionnaire, measuring coping strategies; (b) the Quantity Frequency Variability (QFV) scale, assessing alcohol consumption; and (c) the Rutgers Alcohol Problem Index (RAPI), measuring negative consequences of alcohol use. Britton found that individual coping strategies were associated with levels of alcohol use and alcohol-related consequences. Students who drank to cope reported higher drinking levels than students who coped by expressing emotions. From an SLT perspective, this study showed that some students may reinforce positive alcohol-related expectancies by using avoidance coping strategies (i.e., coping via substance use). Other students may use substances to cope because they observe their peers doing so, even if they know other coping strategies may pose less risk. Britton recommended that college-based alcohol use-prevention programs advocate alternative coping strategies.

In sum, alcohol is present at functions and integral to peer interaction in multifarious social settings. In particular, college students are frequently exposed to alcohol in social settings and engage with peers who model high alcohol-use behaviors. Binge drinking behavior is reinforced by a student's environment and friendships. These studies underscore the utility of SLT as a theory that frames binge-drinking behaviors.

How Social Learning Theory Relates to the Study

The college setting brings students increased opportunity for peer-related social activity (Bonsari & Carey, 2005). Ramped-up social activity increases the likelihood and

number of alcohol-use events (Wechler et al., 2002; White & Hingson, 2013). More drinking events offer more opportunities to drink, which may increase alcohol use (Zamboanga, Rodriguez, & Horton, 2008). Moreover, use of alcohol by peers is related to individual alcohol use in college students (White & Hingson, 2013). In short, SLT provides a strong association between peer drinking behaviors and individual drinking behaviors, as these behaviors are frequently reinforced in the social environment of college (Bonsari & Carey, 2005; Fearnow-Kenny et al., 2001).

How the Research Questions Relate to the Theory

In the study, I sought to determine whether factors such as positive alcohol expectancies, a search for a stress-coping mechanism, or a desire for social conformity may be reasons for increased binge drinking among college females. SLT provides a theoretical foundation for peer influence on alcohol-use norms and engagement in risky behavior (Durkin et al., 2005). In the context of SLT, social reinforcement of binge drinking may result in adopting binge drinking as a way of coping with stress and conforming to peers.

Literature Review Related to Key Variables

Alcohol Abuse in College

Numerous national surveys have documented increased alcohol use among 18- to 21-year-olds (SAMHSA, 2014b). The National Survey on Drug Use and Health (NSDUH) found that 38% of young adults (i.e., 18- to 25-year-olds) reported having engaged in binge drinking and 11% reported “heavy alcohol use” within the previous month (SAMHSA, 2014b). These numbers constitute a major public health concern. In

another annual survey, 43% of male and 32% of female college-age students reported having engaged in binge drinking during the previous 2 weeks (during the previous month, 44% of males and 37% of females) (Johnston et al., 2012). Johnston et al. (2012) reported that the gender difference in alcohol use is narrowing, with the rate for males declining and the rate for females increasing.

Considering the high rate of binge drinking among young people generally, it is not surprising that binge drinking is a significant public health problem on college campuses specifically (NIAAA, 2015b). According to a national survey, 60% of college students aged 18-22 reported having consumed alcohol in the previous month, with two out of three students having engaged in binge drinking in the previous month (SAMHSA, 2014a).

White and Hingson's (2013) review of college drinking surveys indicates that certain individual characteristics and campus-related variables influence binge-drinking behaviors. The Harvard College Alcohol Study (CAS) surveyed 15,000 students from 100 campuses at various times (1993, 1997, 1999, and 2001) and aggregated data concerning college drinking patterns and alcohol-related consequences (Wechsler et al., 2002). The Harvard CAS reported that (a) male gender, (b) Caucasian race self-identification, (c) membership in a Greek organization, (d) participation on a sports team, (e) on-campus access to alcohol, (f) access to discounted alcohol beverages, (g) access to off-campus bars, and (h) self-identification as "coping with stress" are all factors related to excessive drinking behavior.

The following celebratory events prompt college students to increase alcohol consumption: sporting events, spring break, and 21st birthday celebrations. During spring break (the annual spring ritual wherein college students across the U.S. travel to party destinations), 42% of students get drunk on at least one day, with 11% reporting having blacked out or passed out, and 2% reporting contact with police (Litt et al., 2013). At 21st birthday celebrations, four out of five college students drink alcohol, with 33% of all females reporting having consumed 21 or more drinks on this occasion (Rutledge, Park, & Sher, 2008).

Alcohol use has been shown to affect college students' academic performance. Twenty-five percent of college students report having had problems due to alcohol use, including missing classes, falling behind, receiving poor grades on exams or projects, and earning lower grades overall (Wechsler et al., 2002). The Harvard CAS reported that frequent binge drinkers were 6 times more likely to miss class and 5 times more likely to fall behind in classes than their non-binge-drinking peers (Wechsler et al., 2002). Ultimately, college students who binge drink are more likely to drop out of college, work in less prestigious jobs, and be dependent on alcohol 10 years after reporting their binge drinking (Jennison, 2004).

Excessive alcohol use can have major short-term health effects, including blackouts, passing out, and alcohol overdose (White & Hingson, 2013). An *alcohol blackout* is an amnesiac period where the person is able to walk and talk but unable to store events in long-term memory. Passing out from alcohol use involves falling asleep or being unconscious pursuant to heavy drinking. Blackouts are dangerous, in that the

person may participate unwittingly in additional high-risk behaviors (e.g., using other substances, getting in physical fights, or having sexual intercourse) with no recall of the events. The Harvard CAS reported that 27% of college students had experienced blackouts in the previous month (Wechsler et al., 2002). Furthermore, a binge-drinking episode can trigger an alcohol overdose, in which a high amount of alcohol suppresses function in the brain stem nuclei that control breathing and clearing airways (Miller & Gold, 1991). White et al. (2011) found that 29,372 young adults (19,847 males and 9,525 females), 33% of whom were college students, were hospitalized for alcohol overdose in 2008 alone.

Due to increasingly high incidence of alcohol use and its deleterious health impact on the college student population, investigating reasons for high alcohol use could inform interventions and preclude emergencies.

Binge Drinking in College

In 2006, Cranford, McCabe, and Boyd (2006) changed the duration variable from episodes of binge-drinking in the last 2 weeks to episodes in the previous year. The authors administered a survey about alcohol and drug use to a randomized sample of college students, of whom 53.2% reported binge drinking episodes in the past 2 weeks and 63.8% reported binge-drinking variables for prevention or intervention efforts. While the 2006 study found more males than females reporting binge-drinking behavior (which is consistent with the literature), recent statistics show that gender differences are decreasing as more females binge drink (Johnston et al,, 2012). In the study, I aimed to explore further the reasons behind female binge-drinking rates.

Chiauzzi, DasMahapatra, and Black (2013) used latent class analysis (LCA) both to separate college students into subgroups based on drinking/drug-use behaviors and to clarify inter-relationships of risk factors for alcohol use. In the 2013 study, LCA identified four subgroups or classes based on consumption of alcohol and drug use: Class 1, low risk drinking/low prevalence drug use; Class 2, lower intake drinking/moderate prevalence drug use; Class 3, moderate intake drinking/moderate prevalence drug use; and Class 4, high risk drinking/high prevalence drug use. Study participants were first-year students from 89 US colleges who completed an online alcohol and drug prevention course. After successfully dividing the participants into the four classes listed above, LCA then compared survey respondents for (a) drug-harm views, (b) social norms, (c) protective behaviors for alcohol use (e.g., switching between alcoholic and non-alcoholic beverages), and (d) substance use.

In order to evaluate the social norms for alcohol use, all four classes reported (a) the number of peers who drink, (b) the quantity they drink, and (c) the actual number they drank. Students who reported high levels of alcohol and drug use by their peers were more likely to engage in high levels of alcohol and drug use. Class 4 (High risk drinking/high drug use) reported higher amounts and numbers of students who drank then Class 1 (Low risk drinking/low drug use). Class 4 (High risk drinking/high drug use) reported using fewer protective strategies than Class 1 (Low risk drinking/low drug use). Because this study found that social norms perceptions had an effect on substance use, the current study will examine if social norms perception affects college substance use. Chiauzzi et al. suggested that health educators and clinicians promote a realistic social

norms perspective of peer drinking on campus as there is a disparity between perceived and actual alcohol use rates while educating health promotion strategies.

Female Binge Drinking

Binge drinking among female college students has increased (Grucza, Norberg, & Bierut, 2009). White and Hingson (2013) reported that 32 percent of female college students binged on alcohol within two weeks of survey administration. This growing prevalence of female binge drinking is the result of factors unique to females. This section will summarize existing research regarding binge drinking among female college students.

Hensel, Todd, and Engs (2014) examined changes in alcohol- and tobacco-use patterns over a 20-year period by comparing self-report Student Health and Lifestyle Questionnaire survey data from university students in 1991-1992 and 2011-2012. Findings showed that (a) alcohol intake increased overall, (b) female abstainers increased from 27% to 31%, and (c) female binge drinkers increased from 46% to 52%. Hensel et al. recommended that future research examine gender-specific interventions to reduce risky drinking behaviors in female college students. The implications of findings from this study will be discussed in Chapter 5..

Murugiah (2012) conducted in-depth, one-hour interviews with 20 female Australian university students about alcohol-use frequency/patterns, reasons for drinking, and perceptions of binge drinking. Study-eligible participants were 18 to 24-year-old females who had consumed more than four drinks on a single occasion in the previous six months. The study found that females' primary motivation to drink was to facilitate pre-

game or other social interaction. All participants admitted to having had more than four drinks on an occasion, and some did not understand that this was the benchmark of binge drinking. Most participants were confused about the binge-drinking benchmark, and in fact, study participants defined "binge drinking" not as the drinking behavior itself, but rather as a set of behaviors that occur after heavy drinking.

In other words, according to study respondents, the standard for binge drinking is subjective. If the consequence of an alcohol-use event is vomiting, passing out, aggression/violence, or inappropriate sexual behavior, then that instance of alcohol use can retroactively be classified as binge drinking. If none of these behaviors is the consequence of the alcohol-use event, then binge drinking has not occurred, regardless of the actual quantity of alcohol consumed. Therefore, the participants considered binge drinking to be a post-drinking lack of self-control, as opposed to a lack of control pre- or mid-drinking, which differs markedly from public health definitions of binge drinking. Murugiah recommended more research with similar focus groups but larger sample size to determine if a clearer understanding of what constitutes binge drinking could reduce the number of female binge-drinking episodes.

Young, Morales, McCabe, Boyd, and D'Arcy (2005) conducted focus groups of female, alcohol-consuming undergraduate students to investigate if females binge drink as an expression of gender equality. Young et al. approached the focus groups by phone first, screening participants on the basis of drinking pattern. The participants were then divided into four groups: stable high-drinking, stable low-drinking, affiliated with a sorority, and not affiliated with a sorority. Each focus group had eight to ten members,

and group meetings ran for about 90 to 120 minutes in a casual setting, encouraging open expression on topics such as the following: (a) the association between "drinking large amounts" and "drinking like a guy"; (b) the association between "drinking like a guy" and "being liked by a guy"; and (c) the association between "building alcohol tolerance" and "lowering loss of control." Study results indicated that the binge drinkers were trying to "drink like a guy" to emulate male peers and thereby elevate their social status. The authors recommended that the study's focus group-driven, qualitative results be used to inform subsequent, larger quantitative studies able to evaluate links between gender roles and excessive alcohol consumption. The proposed study will use quantitative design to examine motivations and social expectations associated with increased female alcohol consumption.

Kelly-Weeder (2008) reviewed research on the increase in binge drinking among college women to educate nurse practitioners who may treat college women seeking medical attention. Female alcoholics have higher death rates than males. Chronic alcohol abuse in women is associated with high risk of liver disease, circulatory disorders, breast cancer, fertility issues, and early menopause (NIAAA, 2015a). The author's meta-study found that (a) female college students were more likely to drink heavily in their freshman and sophomore years; (b) 50% of sorority members having reported binge drinking in the two weeks prior to being study participants; (c) female athletes reported engaging in more frequent binging episodes than female non-athletes; and (d) female students may drink to reduce negative feelings such as anxiety, depression, or unease. The author recommended that nurse practitioners use motivational interviewing techniques in

routine, screening, or urgent care visits to educate female college students about the risks and consequences of alcohol consumption. The proposed research will examine female-specific factors that drive binge drinking to develop female-specific binge drinking interventions.

Negative Alcohol-Related Consequences

Researchers and national survey data have compiled an extensive list of negative alcohol-related consequences among college students (White & Hingson, 2013). Hingson, Zha, and Weitzman (2009) documented the number of alcohol-related injuries, deaths, and other problems among college students from 1998-2005: (a) a 3% increase in alcohol-related deaths over the seven-year period; (b) a 3% increase of (i.e., 41.7% to 44.7%) in instances of binge drinking; (c) 599,000 college students injured in alcohol-related incidents; (d) 696,000 assaults by intoxicated college students; and (e) 97,000 victims of alcohol-related sexual assault.

Mallett et al.(2013) provided an overview of factors, events, and activities that put college students at high risk of negative alcohol-related consequences. Mallett et al. reported that members of Greek student organizations and students reporting mental health issues experience a higher number of alcohol-related consequences. Students who "drink to cope" may incur alcohol-related consequences such as academic problems, risky behaviors, and poor self-care. Students who already have a history of alcohol issues or alcohol-related violations are also at high risk for these types of consequences. Activities and events with the potential for consequences include the initial transition to college, holidays, 21st birthday celebrations, pre-game parties/tailgating, and Spring

Break. The authors found potential differences in perception between researchers/administrators and students: while the former may see an alcohol-related consequence as a negative one, a student may view the same consequence positively. Students who viewed drinking as positive or fun, reinforce the belief that drinking is rewarding. The authors concluded that this cognitive mechanism, where some students' evaluation of an event as "reward" when the event may commonly be categorized as "punishment", influences whether or not students will engage in binge-drinking behavior. Furthermore, students motivated by binge-drinking peers may be more willing to experience negative alcohol-related consequences. Although individual factors (interpretation of alcohol-related consequences, motives for drinking) are helpful in predicting alcohol use, environmental decision-making factors (e.g., alcohol availability, college policies, economic status) were not included in this review. Comprehensive studies are needed to incorporate both individual and environmental factors. The proposed study will consider both individual and environmental predicates of binge-drinking behavior.

Drinking Motives

Examining reasons for high levels of alcohol consumption, generally, may shed light on factors that predict binge drinking among college females, specifically. In a review of personal motivators for heavy drinking in college students, LaBrie et al. (2007) looked at gender differences in the impact of peers on drinking behavior and drinking consequences. The study design included two groups of college students: one group consisted of volunteer study participants; the other group was composed of adjudicated

students who had violated campus alcohol policy and at high risk for alcohol-related consequences. The authors had hypothesized that social stimuli would have divergent impacts on drinking behavior depending on the gender of the individual subject to the stimulus. In other words, females may use alcohol for social reasons differently from males. LaBrie et al.'s study participants (106 student volunteers and 119 adjudicated students) completed detailed drinking logs for the previous month, noting (a) total drinks, (b) total number of days when drinking took place, (c) number of drinks per event, and (d) heavy drinking episodes. Participants completed both the Rutgers Alcohol Problem Index (to assess alcohol-related consequences in the previous month) and the Reason for Drinking Scale (to assign reasons for drinking (e.g., mood enhancement, social camaraderie, and tension reduction).

Study findings indicated that social camaraderie was correlated with all four documented categories from the participant drinking log. Data showed that all three reasons for drinking (i.e., mood enhancement, social camaraderie, and tension reduction) resulted in higher alcohol-related consequence scores for female volunteer participants; on the other hand, only two of the reasons (i.e., social camaraderie and tension reduction) resulted in high scores for female adjudicated participants. In sum, then, social camaraderie was a motive for all female participants, both volunteer and adjudicated. The data reveal a relationship between female social motives for drinking and female assessment of drinking-related consequences. These data suggest that females may accept some of the perceived adverse effects of drinking in order to make friends, establish intimacy, and improve social interactions, i.e., the perceived positive effects of drinking.

Future research could focus on females' reasons for social drinking to understand if it reflects low self-esteem, need for social affiliation, or a need for intimacy. Results of LaBrie et al.'s study are generalizable. Still, future research into social motivators for college drinking could use alternative scales such as the Drinking Motives Questionnaire, which looks at social conformity (LaBrie et al., 2007). The proposed study will use the Drinking Motives Questionnaire and quantify the social conformity motive to assess its impact on binge drinking among female college students.

O'Brien, Hunter, Kypri, and Ali (2008) examined gender differences in binge drinking among college athletes at a university in New Zealand. O'Brien et al. (2008) administered the Alcohol Use Disorders Identification Test (AUDIT) and Drinking Motives Survey to university athletes, who were the study participants. There were no gender differences in the overall AUDIT scores, but binge drinking was reported frequently (35%). For male students, social enhancements motives significantly predicted high AUDIT scores. For female students, social enhancement and coping motives significantly predicted high AUDIT scores. Conformity was not found to be a significant motive. Because there were some differences in drinking motives between male and female study participants, the authors recommended further research. Although this study did not find conformity to be a significant drinking motive, the proposed study will be using a different instrument to measure drinking motives, which may yield different findings for conformity.

Drinking Expectations

Alcohol expectancies are the beliefs a drinker has about the effects of consuming alcohol (Ham & Hope, 2003). The following research studies have indicated that high positive alcohol expectancies (i.e., expectations of positive reinforcement from alcohol use) have been shown to predict heavy drinking more than a combination of background variables such as gender, class level, ethnicity, marital status, socioeconomic status, religion, immigration status, and family history of alcoholism.

Zamboanga, Horton, Leitkowski, and Wang (2006) conducted a longitudinal study of female college athletes to see if there is a link between positive/negative drinking expectancies and hazardous/non-hazardous drinking behavior. Previous studies of alcohol expectancies and alcohol use among college students had generally been cross-sectional; Zamboanga et al.'s study was longitudinal, focusing on correlations between expectancies and use to see the impact on future behavior. The authors hypothesized that positive expectances (e.g., feeling friendly, acting calm) would result in increased alcohol use and that negative expectances (e.g., acting clumsy, feeling guilty) would reduce or limit alcohol use. Study participants were female college students who completed two surveys (i.e., AUDIT, measuring alcohol use and Comprehensive Effects of Alcohol, measuring drinking expectancies) at two time points (i.e., baseline and one year later). Results confirmed that positive expectancies of alcohol use increased hazardous drinking both at the baseline and one year later. These longitudinal results were consistent with the literature about studies using cross-sectional design. However, while this study did find

that positive expectancy influenced behavior, the authors did not look at other influences of drinking behavior, such as peer groups and cultural norms.

Herschl, McChargue, MacKillop, Stoltenberg, and Highland (2012) looked at implicit motivations (e.g., alcohol-related cognitions and attitudes and economic costs of alcohol) and explicit motivation (e.g., positive alcohol expectancies) in relation to alcohol use in college binge drinkers. The alcohol purchase task (APT) measures estimated alcohol consumption at a hypothetical financial cost (i.e., "How many drinks would you consume if they were $__ each?"). Study participants were college students who completed four questionnaires: the AUDIT (measuring binge behavior), the Rutgers Alcohol Problem Index (measuring past drinking issues), the CEOA (measuring positive alcohol expectancies), and the APT (measuring implicit motivations). Herschl et al. found that both implicit and explicit motivations resulted in binge-drinking behavior, with implicit motivation a stronger predictor of heavy alcohol use, which corroborated the findings of previous studies. The authors recommended that future studies look at any underlying aspects of both implicit and explicit motivations, as both predict binge drinking behavior.

Gaher and Simons (2007) examined the potential relationship between anticipated alcohol consumption-related outcomes (either positive or negative) and problem drinking among college students. Prior research had not found the expected connection between "anticipation of negative alcohol consumption-related consequences" and "non-risky, moderate alcohol-consumption behavior". The authors of this study explored that relationship again, hypothesizing that if study participants expected negative

consequences, then those participants would drink less and consequently experience fewer problems. Study participants were college students who (a) self-reported on alcohol-use frequency and binge drinking and (b) completed the Rutgers Alcohol Problem Index and the Drinker Inventory of Consequences survey instruments. Study data revealed the following: respondents who held more favorable views of alcohol-related consequences engaged more frequently in binge drinking; respondents who perceived no negative consequences engaged in the highest rate of binge drinking among all study participants; female respondents, being far more likely than males to have negative views of alcohol-related consequences, reported a much lower binge-drinking rate. Therefore, study findings confirmed the authors' hypothesis that favorable/unfavorable perception of alcohol-related consequences is directly proportional to rate of binge-drinking behavior. However, the findings did not explain how a positive expectancy for alcohol use impacts binge drinking patterns. Therefore, there may be differences in binge drinking behaviors as students who do not expect problems may binge, whereas other may binge and feel they are in control.

Drinking Motives, Expectancies, and Social Network

Lienemann and Lamb (2013) examined if (a) positive or negative expectancies of alcohol use and (b) self-efficacy in using drinking-refusal/protective strategies predict binge-drinking or non-binge-drinking behavior. Drinking-refusal/protective strategies include ability to refuse alcoholic beverages, non-proclivity to mix other drugs with alcohol, and practicing safe sex under the influence of alcohol. Study participants were female college students who had consumed alcohol at least once. Participants were

divided into two groups: heavy episodic drinkers (HED), or binge drinkers; and non-HED (NED). Participants were asked to complete a web-based survey which included the following: demographic information; the CEOA (measuring positive and negative alcohol expectancies); Cognitive Appraisal of Risky Events (assessing perceptions about likelihood of positive/negative consequences while binge drinking and self-efficacy in using drinking-refusal/protective strategies); and the Drinking Context Scale (DCS) (measuring favorable attitudes toward drinking in various social settings). The authors found that HED females were likely to report higher positive expectancies than NED females, consistent with previous findings that positive expectancies of alcohol are associated with higher alcohol use. Higher positive expectancies of alcohol use in social contexts included "being able to talk to more people" and "feeling relaxed." NED females reported higher self-efficacy beliefs and ability to use drinking-refusal strategies, which resulted in less social drinking. Lienemann and Lamb suggested future research expand the study to include more information about the students' social network, as the social networks of HED included more alcohol consumers. The proposed study will ask if the positive expectancies of alcohol and liquid courage influence a student to drink more to enhance social experiences.

Linden, Lau-Barraco, and Milletech (2014) created a conceptual model that looked at expectancies, motives, and protective behavioral strategies (PBSs) in predicting drinking behavior among college students. PBSs are a cognitive means of decreasing alcohol consumption and avoiding potentially negative alcohol-related consequences. Examples of strategies include alternating between alcoholic and non-alcoholic

beverages, choosing an activity that does not involve drinking, choosing not to participate in drinking games, limiting alcoholic intake, and assigning a designated driver. Previous research had showed a relationship between positive expectancies, drinking motives, and PBSs; a relationship between positive expectancies and positive drinking motives; and a relationship between positive motives and PBSs. Study participants were college students who had consumed at least one drink in the month prior to study participation. Data collected were from self-report questionnaires: (a) the CEOA (measuring alcohol expectancies); (b) the Drinking Motives Questionnaire (DMQ-R) (measuring social and enhancement motives); (c) the Protective Behavioral Strategies Survey (PBSS) (measuring use of protective behavioral strategies while partying); (d) the Daily Drinking Questionnaire (DDQ) (measuring alcohol use); and (e) the Young Adult Alcohol Consequences Questionnaire (YAACQ) (measuring alcohol-related problems in the previous year).

Study results supported the authors' hypothesis that students who expected positive outcomes (i.e., enhanced positivize affect and heightened sociability) were more motivated to drink. Increased drinking motivation resulted in use of fewer PBSs, leading to more alcohol-related problems (i.e., the opposite outcome from what initially motivated the drinking behavior). The authors suggested that drinking interventions for college students include education about PBSs; other suggested elements for interventions were self-awareness activities, as claiming one's motivation and sense of self-efficacy may increase PBS use and result in a different alcohol-use outcome. The authors indicated that research has not yet examined other positive expectancies (e.g.,

liquid courage as a positive expectation of alcohol consumption) or negative drinking motives (e.g., drinking to cope with negative internal moods, social conformity) as they related to binge drinking and alcohol problems. The proposed study will examine if there is a relationship between positive alcohol expectancies, negative drinking motives, and rates of binge drinking in college female students.

Conclusion

The purpose of this study is to determine if there are factors that motivate college females to engage in binge-drinking behavior. Binge drinking on college campuses is a public health concern with a wide variety of associated negative health risks. Social learning theory provides a theoretical framework for learned binge drinking behaviors. However, studies examining negative motives or positive expectations as reasons for college students to experience negative consequences are sparse. This dissertation study hypothesizes there are relationships between binge drinking behaviors of college females and drinking to cope, and positive social outcomes. The findings of this research could assist health care workers and college administrators in education and prevention strategies to reduce binge drinking.

To examine fully if there are significant relationships between binge drinking, negative drinking motives, and positive alcohol expectancies, Chapter 3 will describe the research design and approach used to answer the research questions. Sampling, instruments, and the statistical methods utilized to analyze the data will be provided.

Chapter 3: Research Design and Methodology

Introduction

College campuses report that student binge drinking represents a significant health problem (NIAAA, 2015b). Given the high rates of binge drinking on campus and the gender-specific health risks for female students, it is important to explore the risk factors for binge drinking among female college students. Both male and female college students who reported high levels of alcohol and drug use by their peers were found to be more likely to engage in high levels of alcohol and drug use (Chiauzzi, DasMahaptra, & Black, 2013). Female college students may drink to reduce negative feelings such as anxiety, depression, or unease (Kelly-Weeder, 2008), so another binge-drinking risk factor is drinking to cope with negative internal moods (LaBrie et al., 2007). Furthermore, some studies have indicated that social motives (e.g., drinking to conform, or to avoid alienation; Cooper, 1994) and positive alcohol-related expectancies (e.g., drinking with a positive expectancy of liquid courage, or to feel brave/daring after consumption of alcohol; Fromme et al., 1993) are risk factors for binge drinking among females (LaBrie et al., 2007; Strano, 2004).

However, there are very few studies of gender-specific motivations for/expectations from binge drinking; in other words, little of the extant literature investigates how college females may use alcohol for reasons different from those of college males. The current study addresses this gap, examining the possible predictive factors in binge drinking among female college students and providing more information on which risk factors influence college females' binge-drinking behavior. The risk factors

considered in this study were as follows: (a) drinking to cope with negative internal moods (i.e., coping); (b) drinking to conform (i.e., conforming); and (c) drinking with a positive expectancy of liquid courage (i.e., liquid courage). The purpose of this quantitative study was to determine the impact of coping, conforming, and liquid courage on binge drinking among female college students. Capturing/quantifying the impact of these factors may help to inform campus programs designed to reduce binge-drinking levels.

Chapter 3 lays out in detail the quantitative research design and statistical methods used to explore the research questions. Sample size, sampling procedures, and study-participation criteria (including demographic criteria) are outlined. In this chapter, study instruments are defined/described to justify their appropriateness in measuring research variables. The data-analysis plan (a) describes the statistical tests used to analyze the variables and (b) links the data-interpretation procedures to the testing of research hypotheses. In conclusion, the chapter addresses threats to study validity and any ethical considerations.

Research Questions

Research Question 1: Is coping, as measured by the coping drinking motive subscale of the Drinking Motives Questionnaire (DMQ-R SF), a predictor of binge drinking among college females, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C

$H_0$1: Coping is not a significant predictor of binge drinking among college females.

H_a1: Coping is a significant predictor of binge drinking among college females.

Research Question 2: Is conforming, as measured by the conformity drinking motive subscale of the Drinking Motives Questionnaire (DMQ-R SF), a predictor of binge drinking among college females, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C).

$H_0$2: Conforming is not a significant predictor of binge drinking among college females.

H_a2: Conforming is a significant predictor of binge drinking among college females.

Research Question 3: Is liquid courage, as measured by the liquid courage alcohol expectancy subscale of the Comprehensive Effects of Alcohol (CEOA), a predictor of binge drinking among college females, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C).

$H_0$3: Liquid courage is not a significant predictor of binge drinking among college females.

H_a3: Liquid courage is a significant predictor of binge drinking among college females.

Research Design and Rationale

Engagement in binge drinking was the dependent variable (DV) in this quantitative study. The score for the DV was measured by the first three items on the Alcohol Use Disorders Screening Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). Because 32% of female college students report having recently engaged

in binge-drinking behavior (White & Hingson, 2013), more information was needed to assess which factors influenced this behavior. Three independent variables (IV) provided this information. The first and second IVs were the coping and conformity drinking motives measured by the Drinking Motives Questionnaire (DMQ-R SF) subscale scores (Kuntsche & Kuntsche, 2009). The third IV was the positive alcohol expectancy score (i.e., liquid courage) as measured by the liquid courage subscale on the Comprehensive Effects of Alcohol (CEOA) questionnaire (Fromme et al., 1993).

The research questions were intended to assess whether there are any statistically significant relationships among coping (IV), conforming (IV), and liquid courage (IV) and binge drinking (DV). To examine the research questions, a quantitative survey research design was selected to determine if the independent variables predict the dependent variable (i.e., binge drinking). Quantitative research has the following features: (a) the researcher has a clear research objective; (b) the researcher uses questionnaires or other measures to collect numerical or statistical data; (c) research data are evaluated using statistical tests; and (d) the researcher is objective about the subject matter (McCusker & Gunaydin, 2015). Quantitative research relies more on statistical information than does qualitative research, which examines individual perceptions. Quantitative research is preferable to qualitative research in that accessing data is simpler, faster, and less expensive (McCusker et al., 2015). The study was a good fit for quantitative design because the variables were quantified subject to statistical analysis rather than the textual/anecdotal data generated by qualitative research. Using the research design, I sought both to provide more information about and to quantify the

potential influence of individual factors on binge drinking among college females. A multiple regression analysis was used to examine the relative strength of coping, conforming, and liquid courage in predicting binge drinking among college females.

Methodology

Population

The target population was undergraduate females enrolled at George Mason University (GMU) in Fairfax, VA, a mid-Atlantic public state university. As of 2015-2016, there were 22,304 undergraduate students enrolled at the university (GMU, 2016). Study participants needed to be over 18 years old and able to communicate in the English language. As the purpose of this study was to examine high alcohol use, only participants who had engaged in alcohol consumption in the past year were included in the study.

Sampling

Research data were collected from GMU students who responded to a posted electronic recruitment message; student self-selection to participate entailed a convenience nonprobability sampling approach. There are over 20 million undergraduate college students in the U.S. (National Center for Education Statistics, 2015), so probability sampling was not feasible given the large population size.

Power Analysis

A power analysis completed using G*Power 3.1 analysis (Faul, Erdfelder, Buchner, & Lang, 2009) with an alpha level of .01 and three predictor variables (coping, conforming, and liquid courage) recommended a sample size of 157, given a predicted effect size of .15. The sample size is recommended to be 20 times the number of

predictor variables in a multiple regression analysis (Tabachnick & Fidell, 2013). The small alpha level of .01 is selected to minimize a Type I error.

Recruitment

To initiate participation in the study, the psychology department research coordinator at GMU posted a message on the psychology department message board and Facebook page requesting female subjects. This electronic message provided potential participants with a brief description of the study and access information for the secure Survey Monkey website. Other than age (i.e., > 18), no demographic information was collected.

Data Collection

On the first page of the survey ink, the participants viewed the informed consent form. The informed consent provided the study's purpose, a brief study description, assurance of confidentiality, anticipated average duration (15-20 minutes), and an option to decline survey participation. Although the potential for harm was minimal, the participants were informed of their right to discontinue study participation at any point if they began to experience discomfort from reflecting on social habits or alcohol use. There were no consequences for declining participation in or withdrawing from the study. By continuing to the subsequent page of the survey link, the participant issued consent. The participant]answered the survey questions. Upon completion of the online survey, the participant received a "thank you" message and investigator contact information.

Instruments and Operationalization of Constructs

Measures

Four measures used: (a) a demographic question; (b) the Drinking Motives Questionnaire (DMQ-R) (Kuntsche & Kuntsche, 2009); (c) Comprehensive Effects of Alcohol (CEOA; Fromme et al., 1993); and (d) the Alcohol Use Disorders Screening Test (AUDIT) (Saunders et al., 1993).

Demographic Question

The demographic question requested the age of the participant to ensure that each was older than 18. The current study examined only female consumers of alcohol. A consumer of alcohol is one who drinks beer, wine, or liquor that contains ethyl alcohol. A participant meets the criteria for a consumer of alcohol if his or her response to the first question on the AUDIT questionnaire is greater than 0 (e.g., "How often do you a drink containing alcohol?"). The first question is measured on a scale from 0 to 4 (e.g., 0 = *never*; 1 = *monthly or less*; 2 = *2-4 times a month*; 3 = *2-3 times a week*; 4 = *4 or more times a week*).

Drinking Motives Questionnaire—Revised Short Form (DMQ-R SF)

The DMQ-R SF (Appendix C) was designed to examine the association of four motives with alcohol-consumption patterns and consequences (Cooper, 1994). The four motives are as follows: enhancement (i.e., to achieve a desired emotional state, such as positive mood or well-being); social (i.e., to obtain an external reward, such as social acceptance or approval); coping (i.e., to mitigate negative emotions, such as frustration or sense of loss); and conforming (i.e., to avoid social censure or rejection). In sum, this

instrument is based on the assumption that the motivation to drink is to obtain positive outcomes or to avoid negative ones (Cooper, 1994). The DMQ-R SF is published and permitted to be reproduced and used for educational research without seeking written permission from the developers. The DMQ-R SF takes approximately two to five minutes to complete. While the instrument items explore four motives, the study used items exploring only two of the motives: coping and conforming. The shortened questionnaire for this study consisted of six questions measuring two of the independent variables. The four-item Likert scale ranges from 1 (i.e., *never*) to 5 (i.e., *almost always*). To measure the independent variable coping as a drinking motive, the participant answered three questions (e.g., "Do you drink because it helps you when you feel depressed or nervous?"). To measure the independent variable conforming as a drinking motive, the participant answered three questions (e.g., "Do you drink so you won't feel left out?").

Reliability and validity. The DMQ was tested for construct validity across gender, race, and age and was shown to be reliable and valid by running a chi-square difference test with the normed fit index of .93 and comparative fit index of .94 (Cooper, 1994). Consistency of a scale demonstrates reliability, and both the normed fit and comparative fit indices were .90 or higher.

Instrument used in similar populations. Nemeth, Kuntsche, Urban, Farkas, and Demetrovics (2011) demonstrated the validity and reliability of this measure in a similar population of $N = 390$ adults in a recreational setting. Specifically, they found that the reliabilities for each of the four factors measured in the DMQ-R SF were measured by calculating Cronbach's alpha for each of the dimensions; results indicated that the

Cronbach's alphas were .65 (for the enhancement factor), .80 (for social), .76 (for conformity), and .82 (for coping). Cronbach's alphas of .70 demonstrate satisfactory reliability, leading the researchers to suggest that the reason for the low alpha for the enhancement be explored and that a particular item within that factor be potentially reworded (Nemeth et al., 2011). The validity of the DMQ-R-SF was demonstrated by correlating the totals of each of the four factors with participants' answers to two questions about their alcohol use and alcohol-related problems, such as academic problems, risky sexual intercourse, and violent behavior. Each of the four factors was significantly correlated with answers to at least one of the two questions about alcohol use and at least one of the alcohol-related problems; the exception to this was the enhancement factor, which did not significantly correlate with any alcohol-related problem. Kuntsche and Kuntsche (2009) reported similar findings when the DMQ-R-SR was administered to a similar population of 2,398 Swiss adolescent students. In this study, the authors were comparing a new factor structure with the original format. They found that the confirmatory analysis and all correlations were significant. To test for reliability, all four drinking-motive items had a Cronbach's alpha range of .66 to .83, with the target satisfactory alpha value of at least .7, demonstrating internal consistency.

Instrument suitability to research questions. The DMQ is the most frequently used instrument to assess drinking motives in a younger population (Kuntsche, Knibbe, Gmel, & Engels, 2005). Therefore, it is a good fit for this study. It was appropriate to use the DMQ in this study to measure negative drinking motives (e.g., coping and

conforming) because it has been found to be reliable and valid for measuring drinking motives (Cooper, 1994; Kuntsche & Kuntsche, 2009; Nemeth et al., 2011).

Comprehensive Effects of Alcohol (CEOA)

The CEOA (Appendix B) is a 76-item questionnaire designed and developed to measure positive and negative effects of alcohol (Fromme et al., 1993). The CEOA was informed by previous research, which had indicated that positive and negative expectancies influence drinking decisions (Fromme et al., 1993). CEOA questions are divided into four positive subscales (i.e., sociability, tension reduction, liquid courage, sexuality) and three negative subscales (i.e., cognitive and behavioral impairment, risk and aggression, self-perception). Although the CEOA examines seven factors of alcohol outcome expectancies, the study utilized only one positive expectancy subscale—liquid courage. The shortened questionnaire consisted of five questions (e.g., "I would feel brave and daring") to determine if the participant held a positive expectancy of alcohol use. The four-item Likert scale ranges from 1 (i.e., *disagree*) to 4 (i.e., *agree*). This scale measured the independent variable (i.e., liquid courage). The CEOA is published and permitted to be reproduced and used for educational research without seeking written permission from the developers. The questionnaire takes approximately 10-15 minutes to complete.

Reliability and validity. Fromme et al. (1993) found that the CEOA has adequate construct and criterion-related validity, as well as test-retest reliability. Specifically, the construct validity of the CEOA was demonstrated through the results of confirmatory factor analyses (CFAs) of the four-factor model, which showed that individual item

loadings ranged from .15 to .84 (for the positive expectancy factor), .35 to .78 (for the positive value factor), .32 to .69 (for the negative expectancy factor), and .61 to .80 (for the negative value factor; Fromme et al., 1993). Further, the criterion-related validity of the negative factors was demonstrated by regressing three measures of alcohol use (i.e., quantity, frequency, and weekly consumption, as measured by two measures of alcohol use) onto each of the factors (Fromme et al., 1993). The results of these regressions indicated that negative expectancy and negative value had a significant negative impact on the quantity and frequency of drinking. Finally, the reliability of the CEOA was demonstrated in a test-retest study of 129 participants over a 2-month interval. The test-retest correlations for all four factors were significant (Fromme et al., 1993). The CEOA was developed for use with college student samples but can be applied to the general population (Fromme et al., 1993).

Instrument used in similar populations. There are several previous studies that show CEOA effectiveness. The CEOA was administered to 1004 college students to ensure the questionnaire's factorial validity (Valdivia & Stewart, 2005). The investigators used Principal Components Analysis (PCA) with weighted sums of variables as an analytic strategy to measure the validity and reliability of the summary scores. Results shows that the internal consistency of each subscale ranged from 0.63 to 0.81. Ham, Stewart, Norton, and Hope (2005) compared the validity of the standard CEOA and a brief version, B-CEOA, finding support for the validity of both assessments among undergraduate students (N=734). For the full-scale CEOA, Cronbach's alpha ranged from

.66 to .84 for all seven factors of alcohol expectancy. For the brief CEOA, Cronbach's alpha ranged from .60 to .81 for all seven alcohol-expectancy factors.

Instrument suitability to research questions. Again, the CEOA was developed for use with college student samples (Fromme et al., 1993). Because the target sample for this study is college females, the CEOA is an appropriate screening tool for measuring liquid courage, i.e., a metric of positive alcohol expectancy and an independent variable. The CEOA has been shown to be a reliable, valid survey for measuring alcohol expectancies (Fromme et al., 1993; Ham et al., 2005; Valdivia & Stewart, 2005).

Alcohol Use Disorders Screening Test (AUDIT)

The AUDIT was designed by the World Health Organization (WHO) as a simple assessment of excessive drinking (Saunders et al., 1993). The AUDIT was developed over a period of 20 years in different countries and cultures as a simple screening assessment to be administered orally or by self-report questionnaire. The wording in the AUDIT was designed to be appropriate cross cultures for either gender. The AUDIT is published and permitted to be reproduced and use for educational research without seeking written permission from the developers. The 10 questions in the AUDIT inquire about alcohol use in the past year, alcohol dependence symptoms, and consequences of alcohol use (e.g., "How often do you have six or more drinks on one occasion?"). The survey takes two to four minutes to complete. Each item is measured on a scale from 0 to 4 with anchor points (i.e., 0 = Never to 4 = Daily or almost daily). To score the AUDIT, numbers from answered items are totaled for interpretation: a total score of 8 to 15 results in advice to reduce drinking behavior; 16 to 19 results in counseling and monitoring; a

total score of 20 or more my indicate alcohol dependence (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). A score of 1 or more on question two and/or question three indicates potentially hazardous levels of alcohol consumption.

Reliability and validity. The reliability and validity of the AUDIT have been demonstrated empirically in various clinical and community settings worldwide (Babor et al., 2001). The developers of the AUDIT (Saunders, et al., 1993) set out to test instrument reliability and validity by interviewing 1888 individuals in six countries about their medical history, diet, alcohol consumption/drinking behaviors, alcohol-related issues, and self-perceptions of alcohol problems. Results in intra-scaled reliability for each conceptual domain was determined by computing Cronbach's alpha coefficient (>.70). Results indicated that the alpha coefficients of the alcohol dependence scales showed higher inter-scale reliability (mean=0.93 and 0.81; Cronbach's alpha of drinking behavior = 0.80 to 0.97). AUDIT test scores correlate to known alcoholics and non-drinkers with a 99% and 98% accuracy, respectively (Saunders et al., 1993).

Instrument used in similar populations. The Alcohol Use Disorders Screening Test-Consumption (AUDIT-C, Appendix B) consists of the first three consumption questions on the AUDIT (Bradley et al., 2007). AUDIT-C has been shown to be a valid, effective brief screening tool for alcohol misuse in ethnically diverse US male (*N*=392) and female (*N*=927) primary care populations (Bradley et al., 2007). Bradley et al. evaluated the receiver operating characteristic (ROC) curve that plotted sensitivity (true positive rate of patients who met criteria for alcohol use disorder and whose AUDIT scores tested positive for alcohol use disorder) versus specificity (true negative rate of

patients who met criteria for alcohol use disorder and whose AUDIT scores tested negative for alcohol use disorder) with 95% confidence intervals. The area under the ROC curve (AUROC) intends to measure the screening performance in all screening thresholds where closeness to 1.0 indicates better performance. Bradley et al. found that the AUDIT-C's AUROC curve to validate for alcohol use was 0.91 for women and 0.89 for men. The AUDIT-C was found to be more accurate in identifying alcohol misuse or alcohol-use disorders than a single-item screen (e.g., AUDIT question #3), especially among women (Bradley et al., 2007; Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998). Another study found that 261 random participants completed the AUDIT-C with and AUROC of 0.89, further demonstrating the reliability of the AUDIT-C.

Instrument suitability to research questions. The AUDIT has been shown to be efficacious (i.e., brief, easy to administer, valid, and reliable) in assessing alcohol dependence among university students (Cook, Chung, Kelly, & Clark, 2005). Because the target sample for this study is college females, the AUDIT-C which inquires about alcohol consumption and drinking levels is well-suited to identifying which participants engage in binge drinking, i.e. the dependent variable in the research questions. The AUDIT-C has been established as a reliable and valid screening instrument for measuring potentially hazardous drinking behavior, making it appropriate and suitable as to examine the research questions in this study.

Data Analysis Plan

Data collected through Survey Monkey was downloaded into the Statistical Package for the Social Sciences (SPSS) for Mac data analyses. Data was screened to

include only female participants who are over 18 years of age and who have engaged in instances of alcohol use. Any incomplete surveys were eliminated from the study. SPSS was used to conduct multiple linear regression to evaluate the research questions. Prior to SPSS input, cleaning, and screening of all data values wasconducted to reinforce accuracy.

Descriptive Analysis

Descriptive statistics were conducted on the sample demographics. Means and standard deviations were calculated for continuous data including age, frequency of binge drinking (i.e., less that monthly, monthly, weekly, daily/almost daily) and typical number of drinks consumed in a drinking episode (i.e., 1 or 2; 3 or 4; 5 or 6; 7, 8 or 9; 10 or more).

Inferential Analysis

A multiple regression examined the relative strength of the predictor variables (X) in predicting the dependent variable (Y). The dependent variable is binge drinking and the predictor variables are coping, conforming, and liquid courage analyzed by multiple regression using a standard entry method.

Prior to conducting the multiple regression analysis, all data was checked to validate the assumptions of multiple regression. Because all variables are continuous, the first two assumptions are met. Multiple regression assumes a linear relationship between the independent and dependent variables, normality in the variables, multicollinearity, no auto-correlation, and homoscedasticity. A scatterplot in SPSS was used to test the linearity of the data. To check for normality in the data, all variables were checked for a

normal curve by Q-Q-Plots. Collinearity diagnostics in SPSS confirmed if all the independent variables are independent from one another. A Durbin-Watson's d tests on the null hypothesis showed if the residuals are not linearly auto-correlated. A standardized residual plot (ZPRED on the x-axis and ZRESID on the y-axis) determined homoscedasticity of the variables.

Threats to Validity

There are several threats to the validity of this study. This research is based on self-report questionnaires in one session, so significance of predictors variables cannot lead to estimation of causality. The researcher did not infer any causality or used statistical analysis to determine causality. Because the research questions pertain to social activity, participant responses may fall prey to social desirability pressures. To mitigate this, participants were informed of their anonymity at the beginning of the study.

Participants may be confused about alcohol-serving amounts and may underestimate their drinking behaviors. A survey of 133 college students found that students incorrectly defined "single servings" of alcohol and concluded that students may be underestimating their true alcohol-consumption levels (White et al., 2005). To mitigate this effect, participants in the proposed study were shown a chart equating serving sizes of various alcohol beverages (e.g., 12 ounces of beer equals 5 ounces of wine equals a 1.5 ounce-shot of 80 proof liquor).

Ethical Procedures

This study was conducted within the ethical standards of and approvals by the Institutional Review Boards of Walden University and George Mason University. The

participants were informed that participation is voluntary. Participants were shown the informed consent form at the outset of the study. The informed consent included assurance of confidentiality and a description of how the study data will be used. Participation was anonymous as there will be no signature or name data fields. Participants were informed that if any negative consequences arise from completing this survey about binge drinking, it is recommended that the participant seek counseling at the university's counseling center. The researcher has no professional role in relation to potential study participants. The participant can exit the study at any time. Data was secured by a protected password known only to the researcher on Survey Monkey and SPSS. When participation is complete, data records will be accessed only the researcher, with analysis done on a password-protected personal computer. Data on a flash drive will be kept for at least five years in a bank-housed safety deposit box accessible only to this researcher. The researcher does not have any conflict of interest with the target population and does not plan to use incentives for this study.

Summary

This chapter provided details about research design and methodology. This quantitative survey study seeks to determine if (a) drinking to cope with negative internal moods (i.e., coping), (b) drinking to fit in with or conform to a social group (i.e., conforming), and/or (c) having the positive expectation of liquid courage as an outcome of drinking (i.e., liquid courage) are predictors of binge drinking among college females. The sample for this study wre undergraduate females in a mid-Atlantic public state university. Participants are individuals 18 years of age or older who have engaged in

alcohol consumption. Participants are recruited via a message sent from the college's Psychology Department Research Coordinator. A power analysis calculated 157 participants are needed for this study, but the researcher aims for a minimum of 200 participants due to the possibility of incomplete surveys, age restrictions or participants who have not consumed alcohol. Data was collected using a demographic question (i.e., age), the DMQ-R SF survey instrument to measure coping and conforming, the CEOA survey instrument to measure liquid courage, and the AUDIT-C survey instrument to measure binge drinking. Data was analyzed using a multiple regression to determine if there are any significant relationships between the predictors and outcome variable using the SPSS software program for Mac. The data was collected and password protected. This study was conducted in accordance with the ethical standards set by the Institutional Review Boards of Walden University and George Mason University. Chapter 4 describes the study results.

Chapter 4: Results

Introduction

The purpose of this study was to quantitatively assess the relative strength of coping drinking motivation, conforming drinking motivation, and liquid courage in predicting the behavior of binge drinking among female college students. The three research questions in the study were tested using a standard multiple regression. In this chapter, I describe the data collection and screening procedures, provide the descriptive statistics for the study variables, and summarize the results of the multiple regression analysis.

Research Questions

Research Question 1: Is coping, as measured by the coping drinking motive subscale of the Drinking Motives Questionnaire (DMQ-R SF), a predictor of binge drinking among college females, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C).

$H_0$1: Coping is not a significant predictor of binge drinking among college females.

H_a1: Coping is a significant predictor of binge drinking among college females.

Research Question 2: Is conforming, as measured by the conformity drinking motive subscale of the Drinking Motives Questionnaire (DMQ-R SF), a predictor of binge drinking among college females, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C).

$H_0$2: Conforming is not a significant predictor of binge drinking among college females.

H_a2: Conforming is a significant predictor of binge drinking among college females.

Research Question 3: Is liquid courage, as measured by the liquid courage alcohol expectancy subscale of the Comprehensive Effects of Alcohol (CEOA), a predictor of binge drinking among college females, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C).

$H_0$3: Liquid courage is not a significant predictor of binge drinking among college females.

H_a3: Liquid courage is a significant predictor of binge drinking among college females.

Data Collection

Data collection occurred for a 1-week period in June 2017, and study participants were drawn from the Survey Monkey participation pool based on their having met inclusion criteria. Participants were required to be undergraduate university-enrolled females. Survey Monkey did not reveal how many individuals in the participation pool met inclusion criteria, so it is not possible to calculate a response rate. Skip logic features were used to identify disqualified participants who did not meet the age requirement: The first survey question inquired, “In what year were you born?” Respondents who were born before 1998 were routed to the disqualification page (i.e., “end of survey”); respondents who were of adult age were routed to take the rest of the survey beginning

with the consent form. The informed consent included the purpose of the study, procedures, voluntary nature of the study, risks and benefits, and privacy and contact information for participants who had questions about the study. To protect participant privacy, identifying information was not collected, and continuation of the survey indicated consent to participate.

The participants then answered the survey portion of the study. The score for the dependent variable was measured by the answers to the first three items on the Alcohol Use Disorders Screening Test (AUDIT; Saunders et al., 1993). The first and second independent variables were measured by the answers to the coping and conformity drinking motives subscale scores on the Drinking Motives Questionnaire (DMQ-R SF; Kuntsche & Kuntsche, 2009). The third independent variable was measured by the positive alcohol expectancy score (i.e., liquid courage) as measured by the liquid courage subscale on the Comprehensive Effects of Alcohol (CEOA) Questionnaire (Fromme et al., 1993).

After an evaluation of the data, 10 responses were removed due to incomplete or missing data, leaving a total of 314 participants who had completed the questionnaire. The current study examined only female consumers of alcohol, and a participant met the criterion of being a consumer of alcohol if her response to the first question on the AUDIT questionnaire (i.e., "How often do you have a drink containing alcohol?") was greater than 0. The first question was measured on a scale from 0 to 4 (i.e., 0 = *never*; 1 = *monthly or less*; 2 = *2-4 times a month*; 3 = *2-3 times a week*; 4 = *4 or more times a week*). Seventy-nine participants were not consumers of alcohol and were excluded for

not meeting that criterion. The final sample size was 244 female college students, providing sufficient power with an alpha level of .01. This study had an *n* of 244 with three predictor variables (coping, conforming, and liquid courage) to analyze the research questions and hypotheses.

As indicated in the previous chapter, participants were to be recruited from the population of George Mason University students. However, after a period of 1 month, no George Mason University student had signed up to participate in the study, so the Survey Monkey participation pool was used. This change was approved by Walden's IRB.

Table 1 displays demographics (i.e., age, income level, and geographical area) for the participants. Most participants were aged 18 to 29 (*n* = 162, 66.4%). The most frequently reported income range for the participants was $25,000 to $49,999 (*n* = 51, 20.9%). Participants reported living in all areas of the United States, with the most frequently reported living areas being Pacific (*n* = 56, 23%), East North Central (*n* = 32, 13.1%), and South Atlantic (*n* = 34, 13.9%).

The convenience nonprobability sampling method used to recruit participants restricted my ability to calculate the extent to which this sample represents all adult college females. Therefore, the findings of this study cannot be generalized to all college females. This limitation may result in a low external validity. However, this sample included participants from all geographical areas of the United States. Ideally, participants from international colleges would produce a more representative sample of all adult college females and thereby increase generalizability.

Table 1

Frequencies: Age, Income Level, and Geographical Area of Participants

Variable	*n*	*%*
Age		
18-29	162	66.4
30-44	54	22.1
45-59	20	8.2
Income level		
$0-$9,999	39	16.0
$10,000 to $24,999	29	11.9
$25,000 to $49,999	51	20.9
$50,000 to $74,999	27	11.1
$75,000 to $99,999	8	3.3
$100,000 to $49,999	9	3.7
$125,000 to $74,999	2	.8
$150,000 to $49,999	5	2.0
$175,000 to $74,999	1	.4
$200,000 and up	7	2.9
Prefer not to answer	66	27.1
Geographical area in which you live		
East North Central	32	13.1
East South Central	14	5.7
Middle Atlantic	29	11.9
Mountain	20	8.2
New England	12	4.9
Pacific	56	23.0
South Atlantic	34	13.9
West North Central	16	6.6
West South Central	18	7.4
No answer	13	5.3

The convenience non-probability sampling method used to recruit participants restricts the ability of this However, this sample included participants from all geographical areas of the United States. Ideally, participants from international colleges would produce a more representative sample of all adult college females and thereby increase generalizability.

Results

Descriptive Statistics

The sample consisted of 244 college females who completed the study. Table 2 displays drinking patterns. Approximately one-third of the participants reported drinking alcohol monthly or less (*n* = 113, 35.9%), and approximately one-quarter reported drinking 2-4 times a month (*n* = 81, 25.8%). I found that over 44% (*n* = 108, 44.2%) of the participants reported meeting the binge-drinking criterion of four or more drinks on an occasion by totaling data for three or four drinks (*n* =75, 30.7%); five or six drinks (*n* =22, 9%); seven, eight, or nine drinks (*n* =9, 3.7%); and 10 or more drinks (*n* =2, .8%). Some participants reported that the frequency of consuming six-plus drinks was once per month or less often (*n* = 93, 38.1%).

Table 2

Frequencies: Drinking Patterns

Variable	*n*	*%*
How often do you have a drink containing alcohol?		
Never	70	22.2
Monthly or less	113	35.9
2-4 times a month	81	25.8
2-3 times a week	37	11.8
4 or more times a week	13	4.1
How many drinks containing alcohol on a typical drinking day?		
1 or 2 drinks	136	55.7
3 or 4 drinks	75	30.7
5 or 6 drinks	22	9.0
7, 8, or 9 drinks	9	3.7
10 or more	2	.8
How often do you consume 6+ drinks?		
Never	128	52.5
Monthly or less	93	38.1
2-4 times a month	19	7.8
2-3 times a week	2	.8
4 or more times a week	2	.8

Table 3 displays the means and standard deviations of the following variables. Alcohol Use Disorders Screening (AUDIT) total score, or dependent variable binge drinking, had a mean of 3.02 (*SD* = 1.96). Question 1 of the AUDIT ("How often do you have a drink containing alcohol?") had a mean of 1.8 (*SD* = .89). Question 2 of the AUDIT ("How many drinks containing alcohol do you have on a typical drinking day?") had a mean of .63 (*SD* = .86). Question 3 of the AUDIT ("How often do you consume 6+ drinks?") had a mean of .59 (*SD* = .74). The Drinking Motives Questionnaire (DMQ-R SF) survey provided the independent variables of coping (*M* = 2.85, *SD* = 3.28) and

conforming (*M* = 1.57, *SD* = 2.26). The Comprehensive Effects of Alcohol (CEOA) survey provided the independent variable liquid courage (*M* = 7.59, *SD* = 4.06).

Table 3

Descriptive Statistics for Binge Drinking, Coping, Conforming, and Liquid Courage

Variable	*M*	*SD*	*n*	Min	Max
Binge drinking	3.02	1.97	244	0	11
How often do you have a drink containing alcohol?	1.8	.89	244	1	4
How many drinks containing alcohol on a typical drinking day?	.63	.86	244	0	4
How often do you consume 6+ drinks?	.59	.74	244	0	4
Coping	2.85	3.28	244	0	12
Conforming	1.57	2.26	244	0	12
Liquid courage	7.59	4.06	244	0	15

Evaluation of Statistical Assumptions

Assumptions of multiple regression were analyzed to ensure a linear relationship between variables, normality in the variables, multicollinearity, no autocorrelation, and homoscedasticity (Tabachnick & Fidell, 2013). To check for a linear relationship between variables, scatterplots (Appendix D) between the dependent variable (binge drinking) and each of the independent variables (coping, conforming, and liquid courage) all demonstrated a good linear relationship. The assumption of a linear relationship for this model was confirmed.

To test for normality of variables, the Shapiro-Wilk test was conducted. Table 4 displays the results for the Shapiro-Wilk test for normality, skewness, and kurtosis.

The Shapiro-Wilk test showed that the data were not normally distributed for all variables and that the assumption of normality was not met. The kurtosis of conforming (3.903) indicated that the distribution was not normal.

Table 4

Normality Testing for Binge Drinking, Coping, Conforming, and Liquid Courage

	Statistic	*df*	*p*	Skewness	Kurtosis
Binge drinking	.880	244	.000	1.014	1.367
Coping	.823	244	.000	1.107	.266
Conforming	.728	244	.000	1.904	3.903
Liquid courage	.954	244	.000	-.284	-.558

Q-Q plots of each variable (Appendix E) demonstrated that the distribution for liquid courage is normal, in that the data points are very close or on the line. However, the distribution for binge drinking, coping, and conforming skews, and normality cannot be assumed for these variables. The assumption of normality was closely met for the data.

The predictors should not be highly correlated with each other to show no multicollinearity in this model. Table 5 presents the variance inflation factor (VIF) for the predictor variables. Multicollinearity was not present in the multiple regression model because tolerance for all three predictors was > .01 and all VIF are < 10.

Table 5

Collinearity Diagnostics

Model	Tolerance	VIF
(Constant)		
Coping	.819	1.222
Conforming	.890	1.123
Liquid courage	.883	1.113

The data should demonstrate little or no autocorrelation and independence from each other. The Durbin-Watson test was used to test for the presence of serial correlation among the residuals. A value around 2 indicates no autocorrelation. This study had a Durbin-Watson $d = 2.050$, so little or no autocorrelation was found in the data.

The points of the regression standard residual were normally distributed with no strong deviations, and the distribution was not curved (Appendix F). This confirmed that the residuals were normally distributed and homogeneity of the variance was not present.

Homoscedasticity verifies that the variance of error terms is similar across the independent variables. The scatterplot of the standarized residual and standardized predicted value indicates that there was no violation in linearity of homoscedasticity (Appendix G). In that the plot shows random data, heteroscedasticity was not present in the data; therefore, homoscedasticity is assumed in the data.

Statistical data were examined to assess the reliability of the measures used. A Cronbach's alpha coefficient was conducted on the three measures for a reliability analysis (Tabachnick & Fidell, 2013). The Alcohol Use Disorders Screening Test (AUDIT-C) had a Cronbach's alpha coefficient of .696, indicating that the AUDIT-C had

suitable internal consistency. The Comprehensive Effects of Alcohol (CEOA) had a Cronbach's alpha coefficient of .870, indicating that the CEOA had good internal consistency. The Drinking Motives Questionnaire (DMQ-R SF), had a Cronbach's alpha coefficient of .816, indicating that the DMQ-R SF had good internal consistency.

Multiple Regression Analysis

A standard multiple linear regression was conducted to evaluate the relative strength of the predictor variables of coping, conforming, and liquid courage on the criterion variable of binge drinking. The multiple regression results (Tables 6-7) indicated that the model significantly predicted binge drinking as measured by the Alcohol Use Disorders Screening Test (AUDIT-C), R^2 = (.255), Adjusted R^2 = (.246), F(3,243) = 27.414, $p < .01$. The effect size was .255, and it is interpreted as small to medium if it is greater than .1 (small) and less than .3 (medium). Table 8 presents the coefficients for each predictor variable.

Table 6

Model Summary: Binge Drinking on Coping, Conforming, and Liquid Courage

R	*R* square	Adjusted *R* square	Std. error of the estimate
.505	.255	.246	1.709

Table 7

ANOVA Results for the Regression Model

	SS	*df*	*MS*	*F*	*p*
Regression	240.137	3	80.046	27.414	.000
Residual	700.760	240	2.920		
Total	940.898	243			

Table 8

Coefficients

	B	*SE*	β	*t*	*p*	*VIF*
(Constant)	1.526	.237	0.22	6.450	.000	
Coping	.225	.037	.376	6.102	.000	.883
Conforming	.024	.051	.027	.462	.089	.890
Liquid courage	.107	.029	.222	3.736	.000	.819

Coping and Binge Drinking

Research Question 1 asked if there was a relationship between coping, as measured by the coping drinking motive subscale of the Drinking Motives Questionnaire (DMQ-R SF), and binge drinking, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C), among college females. The multiple regression analysis showed that coping was a significant predictor of binge drinking, ß = .376, $p < .01$. Coefficients based on a regression analysis showed that coping was a significant predictor of binge drinking, with higher coping scores resulting in higher binge drinking scores ($t = 6.102$, $p = .000$, *ß* = .376). Thus, the null hypothesis was rejected.

Conforming and Binge Drinking

Research Question 2 asked if there was a relationship between conforming, as measured by the conformity drinking motive subscale of the Drinking Motives Questionnaire (DMQ-R SF), and binge drinking, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C), among college females. The multiple regression analysis showed that conformity was not a significant predictor of binge drinking, ß = .027, $p > .01$. Coefficients based on a regression analysis showed that conformity was not

a significant predictor of binge drinking (t = .462, p = .089). The null hypothesis was not rejected.

Liquid Courage and Binge Drinking

Research Question 3 asked if there was a relationship between liquid courage, as measured by the liquid courage alcohol expectancy subscale of the Comprehensive Effects of Alcohol (CEOA), and binge drinking, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C), among college females. The multiple regression analysis-showed that liquid courage was a significant predictor of binge drinking, ß = .222, p < .01. Coefficients based on a regression analysis showed that liquid courage was a significant predictor of binge drinking, with higher liquid courage scores resulting in higher binge drinking scores (t = 3.736, p = .000, ß = .222). Thus, the null hypothesis was rejected.

Summary

Multiple regression analysis was utilized to evaluate if there were any significant relationships between the three predictors (coping, conforming, and liquid courage) and the outcome (binge drinking) variable. Results showed coping and liquid courage were significant predictors of binge drinking. Results showed that conforming was not a significant predictor of binge drinking. Chapter 5 will interpret the findings, discuss possible implications for social change, and provide recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to determine if negative drinking motives (i.e., coping, conforming) and positive expectancies (i.e., liquid courage) would predict binge drinking among female college students. Heavy and problematic drinking by male college students has been well documented in the literature (Ham & Hope, 2003). The rate of binge drinking among college females has been increasing (Grucza, Norberg, & Bierut, 2009). Hensel, Todd, and Engs (2014) reported that the percentage of college females who engaged in binge drinking increased from 46% in 1991-1992 to 52% in 2011-2012. Kelly-Weeder (2008) reported that females are vulnerable to gender-specific public health concerns: (a) female alcoholics have higher death rates than males, and (b) chronic alcohol abuse in women is associated with high risk of liver disease, circulatory disorders, breast cancer, fertility issues, and early menopause. With this research, I sought to address a gap in the literature by investigating how college females may use alcohol for reasons different from those of college males by examining the influence of underexplored negative drinking motives (i.e., coping, conforming) and unexplored positive expectancies (i.e., liquid courage).

To answer this study's research questions, a quantitative, nonexperimental survey research design was used to examine the relationship between the dependent variable (binge drinking) and the three independent variables, which were quantified by numerical data and statistically analyzed. Quantitative surveys were used to gather data from adult college females. The dependent (outcome) variable was binge drinking (i.e., four or more

drinks for females in one sitting; CDC, 2018). The independent (predictor) variables were coping (i.e., drinking in order to decrease negative internal moods; LaBrie et al., 2007); conforming (i.e., drinking to fit in or avoid social rejection; Cooper, 1994); and liquid courage (i.e., drinking to feel brave and daring; Fromme et al., 1993). A standard multiple regression model showed that coping and liquid courage were significant predictors of binge drinking; however, conforming was not. In this chapter, I discuss the interpretation of the study's findings, limitations, recommendations for future research, and implications for social change.

Interpretation of the Findings

Coping and Binge Drinking

The first research question examined whether there was a relationship between coping, as measured by the coping drinking motive subscale of the Drinking Motives Questionnaire (DMQ-R SF), and binge drinking among college females, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C). The null hypothesis was rejected, showing that higher coping scores resulted in higher binge drinking scores. This finding is consistent with results of previous studies and aligns with this study's theoretical framework.

Kelly-Weeder (2008) reported that female college students may drink to reduce negative feelings such as anxiety, depression, or unease. Similarly, LaBrie et al. (2007) found that drinking to cope with negative internal moods is a binge-drinking risk factor. Britton (2004) found that students who drank to cope reported higher drinking levels than students who coped by expressing emotions. In addition, coping is a motivator for

problematic alcohol-use socializing behavior (O'Brien et al.,2008). Therefore, if a female college student tries binge drinking as a way to cope, and if she finds that the behavior is an effective way to cope, then that binge-drinking female is more likely to socialize with peers who binge drink and regard binge drinking positively (Durkin et al., 2005).

Social learning theory (SLT; Bandura, 1973) posits that behavior is learned and reinforced by observations of others in social settings. The SLT social-reinforcement-of-existing-behavior component (i.e., as opposed to the SLT initial-adoption-of-a-behavior component) illustrates how college peers can socially amplify individual alcohol use initially triggered by the highly personal coping motivator (Bonsari & Carey, 2005).

Thus, after the motivator of coping prompts the individual to binge drink, the social atmosphere of college exposes binge-drinking individuals to alcohol and clusters binge drinkers with peers who also model high alcohol-use behaviors (Borsari & Carey, 2005). Peer and individual binge-drinking behavior is reinforced by a student's social activities and friendships (Borsari & Carey, 2005; Fearnow-Kenny et al., 2001). In sum, female students may be vulnerable to turning to alcohol for maladaptive coping and then having that maladaptive behavior reinforced through the unique social environment of college. This application of SLT is not specific to the initial motivator of coping, but it is distinct and independent from the conforming motivator. These results confirm the need for more research into this phenomenon, which is underrepresented in the literature.

Conforming and Binge Drinking

The second research question asked if there was a relationship between conforming, as measured by the conformity drinking motive subscale of the Drinking

Motives Questionnaire (DMQ-R SF), and binge drinking among college females, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C). The null hypothesis was not rejected, indicating that conformity was not a significant predictor of binge drinking.

Social conformity (i.e., drinking to fit in or to avoid social rejection) was not found in this study to be a predictor of binge drinking. Similarly, O'Brien et al.((2008) examined gender differences in binge drinking among college athletes at a university in New Zealand and found that females were not motivated by conformity to engage in drinking behavior. In contrast, LaBrie et al. (2007) looked at gender differences in the impact of peers on drinking behavior and drinking consequences and found that social camaraderie was a motive for all female participants. LaBrie et al. used the Reason for Drinking Scale instrument to assign reasons for drinking (e.g., mood enhancement, social camaraderie, and tension reduction); the different instrument used in the present study, the DMQ-R SF, could generate different results. A comparison of the two reasons-for-drinking instruments could be a subject for future studies. Moreover, Chiauzzi, DasMahaptra, and Black (2013) reported that both male and female college students who reported high levels of alcohol and drug use by their peers were themselves more likely to engage in high levels of alcohol and drug use; however, no causation was found by Chiauzzi et al., meaning that individuals with similar habits may be congregating, not that individuals are conforming to group behavior. Given that these two studies were conducted some time ago and included males, perhaps a more current trend indicates that

social conformity is not a strong motivator for binge drinking among female college students.

The social atmosphere of college frequently exposes college students to alcohol-use events with peers who model high-volume alcohol use (Bonsari & Carey, 2005). SLT provides a useful theoretical foundation for explaining how observation of peers' binge-drinking behaviors can reinforce the individual's binge-drinking proclivity (Fearnow-Kenny et al., 2001; White & Hingson, 2013). Particularly, there is strong evidence that binge drinking is frequent among U.S. college students who are participating in Greek life (i.e., fraternity and sorority memberships). These student organizations provide social events with alcohol and encourage secrecy and rituals (Scott-Sheldon, Carey, & Carey, 2008; Turrisi, Mallett, Mastroleo, & Larimer, 2006). Fraternity and/or sorority parties attract underage students who may already be heavy drinkers by promoting an image or atmosphere of heavy drinking (Borsari, Hustad, & Capone, 2009; Wechscler, Kuo, & Dowdall, 2000).

However, social conformity was not found in this study to be a significant predictor of binge drinking; these findings may indicate that SLT explains how social contexts can reinforce binge-drinking behavior but not instill it. This study did not include membership in Greek life, which may have influenced the motive for binge drinking. The idea that social conformity can amplify incipient binge-drinking behavior but may not elicit the behavior ex nihilo should be examined in future research.

Liquid Courage and Binge Drinking

The third research question asked whether the expectation of liquid courage measured by the subscale of the Comprehensive Effects of Alcohol (CEOA) predicts binge drinking among college females, as measured by the Alcohol Use Disorders Screening Test (AUDIT-C). The null hypothesis was rejected, showing that higher liquid courage scores result in higher binge-drinking scores.

This finding was consistent with results of previous studies. Past research has found that positive alcohol-related expectancies (e.g., drinking with a positive expectancy of liquid courage, or to feel brave/daring after consuming alcohol) are risk factors for female binge-drinking behaviors (Cooper, 1994; Fromme et al., 1993; LaBrie et al., 2007; Strano, 2004).

In the context of SLT, these findings dovetail with the results from analysis of the previous two dependent variables: Binge-drinking behavior originates from individual, personal motivators, and binge-drinking behavior is reinforced by social motivators. Again, college presents a unique environment with ready collections of social/peer groups, frequent socialization, and the presence of easily available alcohol (Ham & Hope, 2003). If an individual identifies "acquisition of liquid courage" as a personal motivator for binge-drinking behavior, this in itself indicates a desire for social contact; liquid courage has little application in isolation. Thus, an individual's incipient binge-drinking behavior may again (a) result in participation in group-level binge-drinking behavior (e.g., at Greek parties) in the unique sandbox of the college campus and (b) be reinforced (in an SLT context) by social dynamics. Future investigations of female binge-drinking

tendencies may explore both how suboptimal individual behavior is exacerbated within social environments and how "courage" is defined by those who self-identify as seeking it through alcohol use. Due to the wide evidence of Greek system membership's influence on binge-drinking behavior (Borsari, Hustad, & Capone, 2009), a future study could examine the relationship between sorority membership and specific individual positive expectancies of alcohol use (e.g., liquid courage).

The present study contributes to the body of knowledge by investigating an increasing number of instances of binge drinking among female college students. Because this is a recent trending issue (Hensel, Todd, & Engs, 2014; Sacks, Gonzales, Bouchery, Tomedi, & Brewer, 2015; SAMHSA, 2014b), few studies have investigated reasons behind this increase. This study provided two predictors of binge drinking (i.e., coping and liquid courage), justifying more research on other risk factors to understand this rising health epidemic.

Limitations of the Study

Although this study contributes to knowledge on risk factors for college female binge-drinking behavior, there were limitations to this research. The study's need for individuals who were willing to answer online survey questions with no compensation or incentive may have limited the number of participants. Individuals who chose not to participate might have offered different responses from those who chose to participate in this study, which might have resulted in different findings. The target population included female adult college student consumers of alcohol. Results of this study, as displayed in Table 2, indicated that of the 244 participants, 55.7% did not report meeting the binge-

drinking criterion of four or more drinks during a single occasion (CDC, 2018). The results of the data analysis might have been different if a larger number of participants had met the binge-drinking criterion. A greater number of participants would provide more statistical power and more generalizability. Furthermore, the external validity of the study is limited to adult female college students in the United States and is not representative of international female college populations or all female adults.

Another limitation to this study may have involved data collection through self-report and recall bias. College students may suffer negative consequences associated with violating college alcohol policies and may thus underreport alcohol use (Walker & Cosden, 2007). Past studies have also demonstrated recall bias for alcohol consumption, in that some college students incorrectly estimate alcohol-use quantities (White et al., 2005). This study displayed a chart of alcohol serving sizes (e.g., 12 oz. of beer = 5 oz. of wine = a 1.5-ounce shot of 80-proof liquor) as a reminder for correct reporting of alcohol use.

Social desirability bias was another potential limitation of this study. Participants in this study may have responded to survey questions with a social desirability bias, which can prompt participants to self-report inaccurately on sensitive topics to present themselves favorably (Borsari & Carey, 2006; Durkin et al., 2005). Tourangeau and Yan (2007) reviewed reporting errors on surveys with questions on sensitive topics (e.g., drug use, abortion, sexual behavior). Participants may overreport socially desirable behaviors and underreport socially undesirable behaviors. Response confidentiality may mitigate these pressures and result in more accurate data: Self-administered and computerized

anonymous surveys result in more truthful responses to sensitive topics versus face-to-face, telephone, or nonanonymous interviews (Tourangeau & Yan, 2007). The results of this research were dependent on the veracity of the data, and honest reporting was encouraged through the confidentiality of online data collection and by providing participants with the option to exit the survey at any time.

Davis, Thake, and Vilhena (2010) assessed the impact of social desirability biases (impression management and self-deception) on self-reports of alcohol consumption (AUDIT scores) and harms using an online confidential survey of 391 Canadian college students. The investigators defined *impression management* as a conscious behavior to deny socially deviant behavior or underestimate behavior to appear more attractive or virtuous. *Self-deception* was defined as exaggerating socially positive characteristics. The study found that impression managers underestimated their alcohol consumption but self-deceivers did not inaccurately report alcohol consumption. Davis et al. speculated that college students' underestimation or accurate estimation of alcohol consumption depended on the valorization/pejoration of alcohol consumption within their respective peer groups. This result underscores the strength of social desirability pressure.

The final limitation of this study is found in the method of data analysis. The statistical analysis provides information on predictor variables for binge drinking. Although the multiple regression found relationships between two of the predictor variables and the outcome variable, significant multiple regression findings cannot conclude causation (Tabachnick & Fidell, 2013). Research reviewed on female binge drinking indicated a gap in drinking motives and outcomes (Linden, Lau-Barraco, &

Milletech, 2014), justifying the need for this study. However, other possible study confounds that may have influenced the results were not controlled for, such as membership in Greek life on college campuses, individual stressors, dependence on alcohol or other substances, culture/ethnicity, or a cormorbid mental health diagnosis (e.g., depression or anxiety). Future research could explore whether these possible confounds, which have been found in past literature to be risk factors linked to college drinking, increase binge-drinking behavior (Ham & Hope, 2003; Mallett et al., 2013).

Recommendations

This study aimed to increase the knowledge base of risk factors for rapidly rising female binge drinking in college. More knowledge is needed in this field, which has not been extensively researched (Linden, Lau-Barraco, & Milletich, 2014).

To enhance the generalizability of the findings, it would be beneficial to repeat this study on a larger scale with an increased number of participants. Previous research provides strong evidence that male college students engage in higher levels of substance use than female college students (Ham & Hope, 2003; Wechsler et al., 2002); however, the rate of binge drinking among college females is increasing (Grucza, Norberg, & Bierut, 2009). Only adult females in U.S. colleges were included in the study. Expanding the sample to include international colleges would provide a better understanding of this phenomenon and a better ability to address this increasing public health concern. Kuntsche, Knibbe, Gmel, and Engels (2006) found that country-level data indicate differences in specific drinking motives but that ethnic subcultures have similar motives, even in the same country. Therefore, if the sample frame expands to include a higher

number of ethnically diverse participants, future research may take into account the impact of culture-specific beliefs or ethnicity on binge drinking.

The present study demonstrates a relationship between coping and binge drinking; however, future research could explore "coping" with far more specificity. Britton (2004) found that students who drank to cope reported higher drinking levels than students who coped by expressing emotions. Britton measured coping strategies with a COPE questionnaire consisting of subscales such as positive reinterpretation, mental disengagement, venting of emotions, active coping, humor, and drinking. Britton recommended that alternative coping strategies would be useful in college-based alcohol use-prevention programs. My findings suggest that future research may expand upon the present study not only by looking at the coping drinking motive subscale of the Drinking Motives Questionnaire (DMQ-R SF) but also by including the COPE questionnaire to find alternatives to using substances to cope. In addition, comorbidity with another mental health disorder such as anxiety or depression may contribute to binge drinking in females (Cranford, Eisenberg, & Serras, 2009), but these clinical conditions are beyond the scope of my study and should be the focus of future research.

Binge drinking is associated with alcohol dependence (CDC, 2017). Knight et al.(2002) examined alcohol abuse and dependence in U.S. college students and reported frequent binge drinkers are thirteen times more likely to be diagnosed with alcohol abuse and 19 times more likely to be diagnosed with alcohol dependence. Knight et al. concluded the college environment increased alcohol abuse and alcohol dependence. McKetin, Chalmers, Sunderland, and Bright (2014) surveyed young adults and found that

stimulant intoxication (e.g., ecstasy, cocaine, amphetamine or methamphetamine), was associated with binge drinking, but they did not find a relationship with cannibus intoxication. The current study focused on how SLT helps explain college female binge drinking, but future studies could examine the impact of binge drinking in college environments on clinical conditions such as alcohol and drug dependence.

Although this study found that individual factors (interpretation of alcohol-related expectancies, motives for drinking) predicted alcohol use, environmental decision-making factors (e.g., alcohol availability, college policies, economic status, Greek membership) were not included as predictors in this study. Mallett et al.(2013) recommended comprehensive studies incorporating both individual and environmental factors to better address and understand why this rise in binge drinking is occurring with college females. Bosari, Hustad, and Capone (2009) stated that fraternity and sorority members experienced higher alcohol-use levels and greater numbers of alcohol-related problems than non-Greek students. Conversely, Larimer, Anderson, Baer, and Marlatt (2000) found that sorority members reported fewer negative alcohol-related consequences than other frequent female college drinkers who lived in residence halls. This suggested that residence in a sorority may serve as a protective factor for college women.

Membership in Greek organizations may provide a unique setting for fostering effective campus efforts to reduce heavy alcohol use. Brown-Rice, Furr, and Jorgensen (2015) examined college students in Greek organizations to see if educational interventions changed individual perceptions of high-risk drinking. Their research

revealed college males reported higher binge drinking levels than females. Brown-Rice et al. initiated alcohol-education sessions at fraternities (Greek organizations for men) and sororities (Greek organizations for women) on college campuses. The authors found that attending the educational sessions did change students' perspectives. The authors further concluded that, owing to Greek organizations' focus on leadership, future programs could encourage drinking norms and positive coping behaviors modeled by leaders. Consideration of environmental factors (e.g., alcohol availability, college policies, economic status, Greek membership), in conjunction with individual factors, is needed to develop more effective intervention strategies.

Implications for Social Change

National surveys have documented a high incidence of binge drinking on college campuses (SAMHSA, 2014b). Binge drinking is a major public health concern due to the 38% of young adults (i.e., 18 to 25) who reported having engaged in binge drinking during the previous month (SAMHSA, 2014b). Hensel, Todd, and Engs (2014) reported a need for gender-specific interventions since the number of college females who engaged in binge drinking increased from 46% in 1991-1992 to 52% in 2011-2012. Excessive alcohol use can result in adverse health effects including blackouts and alcohol overdose (White & Hingson, 2013). Alcohol use by college students has a negative impact on academic performance and increases the likelihood of life-long alcohol dependence (Jennison, 2004). Kelly-Weeder (2008) illustrated that binge drinking among females has alarming long-term, gender-specific concerns: female alcoholics have higher death rates than male alcoholics and have a higher risk of liver disease, circulatory disorders, breast

cancer, fertility issues, and earlier menopause. Given how risky binge drinking is for females, the findings of this study may be beneficial in many ways.

Health Care Interventions

Health care professionals may use the results of this study to understand why this rise in female binge drinking is occurring. Britton (2004) recommended alternative coping strategies for health care professionals developing college-based alcohol use-prevention programs. Health care providers may develop group therapy or instructional programs, properly educating the college-age population about the true effects of even short-term binge-drinking behavior. The individual college female, with the support of her family, can engage in effective treatment through services such as individual counseling, residential/partial hospitalization/intensive outpatient treatment, 12-step groups (SAMSHA, 2016). Psychiatric mental health professionals can also provide health alternatives to coping with feelings and stress instead of turning to alcohol.

College Administrative Interventions

College administrators may implement campus practices that adjust students' perceptions of social norms associated with alcohol consumption (Chiauzzi, DasMahapatra, & Black, 2013). Colleges can provide alternatives to the traditional alcohol-centered social activities (e.g., Greek parties and tailgating) by implementing alcohol-free, expanded late-night student activities. Campus policies could alter "party school" perceptions by having Friday classes, suspending students who drink, and working with local police and businesses to be more vigilant in checking student IDs (Sher & Rutledge, 2007). SAMSHA (2017) highlighted several recommendations to

colleges made by the 2007 Surgeon Generals Call to Action to Prevent and Reduce Underage Drinking. Colleges can (a) provide alcohol-free spaces for students; (b) enforce rules against underage drinking; (c) restrict the sale of alcohol on campus; and (d) educate parents, students, and faculty about the dangers of drinking on college campuses.

The current study found two significant risk factors (i.e., coping and liquid courage) for college female binge drinking. Since educational programs are most effective in the short term (Brown-Rice, Furr, & Jorgensen, 2015), it is recommended that prevention programs or social media campaigns be implemented right before college students attend Greek fraternity/sorority events and/or other high-risk social events (e.g., tailgating, spring break), when excessive drinking is likely. This strategy would be beneficial to public health agencies, campuses, and community task forces. The results of this study can assist college prevention programs, psychologists, medical staff members, policymakers, and substance-abuse counselors in designing binge-drinking interventions specifically for females, focusing on these risk factors.

On the other hand, social conformity was not a significant predictor of female college binge drinking. This study did not include investigating Greek membership, which may influence a college student's motives for drinking. Future studies are needed to identify specific social motives that influence binge drinking in sororities and fraternities to make a greater positive social change within college Greek life.

In sum, the findings of this study to understand what factors influence the increase of college female binge drinking provided several social change implications. SLT has shown to be a useful theoretical framework for understanding individual coping

behaviors and social environments with respect to drinking motives. Confounds identified in previous studies as risk factors linked to college heavy drinking (e.g., Greek life, individual stress or other mental health disorder, and alcohol or drug dependence) should be examined in future research. Exploring environmental factors and repeating the study on a larger scale will increase knowledge of this public health concern and help inform robust strategies for managing and decreasing binge drinking on college campuses.

Conclusion

This study aimed to examine whether drinking motives and expectancies predict binge-drinking behavior among college females. The US Surgeon General announced a call to research to reduce the epidemic of college binge drinking (DHHS, 2000). Findings demonstrated that coping and liquid courage were two high-risk factors that motivate college females' binge drinking. If made available to health care practitioners and college administrators, these risk factors can inform alcohol-use warning programs. Awareness of the rise in college female binge drinking is the first step to identifying all risk factors so binge drinking can be reduced on college campuses.

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Appendix A: Alcohol Use Disorders Screening Test—Consumption

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

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

   0 - Never

   1 – Monthly or less

   2 – 2-4 times a month

   3 – 2-3 times a week

   4 – 4 or more times a week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

   0 – 1 or 2

   1 – 3 or 4

   2 – 5 or 6

   3 – 7, 8, or 9

   4 – 10 or more

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

   0 - Never

   1 – Monthly or less

   2 – 2-4 times a month

3 – 2-3 times a week

4 – 4 or more times a week

Appendix B: Comprehensive Effects of Alcohol

Instructions: The following questions ask what you would expect to happen if you were under the influence of ALCOHOL. Circle from disagree to agree – depending on whether you expect the effect to happen to you if you were under the influence of alcohol. These effects will vary, depending upon the amount of alcohol you typically consume. This is not a personality test. We want to know what you would expect to happen if you were to drink alcohol, not how you are when you are sober. Example: If you are always emotional, you would not circle agree as you answer unless you expected to become more emotional if you drank.

1. I would feel courageous

Disagree	Slightly Disagree		Slightly agree	Agree
0	1	2	3	4

2. I would feel brave and daring

Disagree	Slightly Disagree		Slightly agree	Agree
0	1	2	3	4

3. I would feel unafraid

Disagree	Slightly Disagree		Slightly agree	Agree
0	1	2	3	4

4. I would feel powerful

Disagree	Slightly Disagree		Slightly agree	Agree
0	1	2	3	4

5. I would feel creative

Disagree	Slightly Disagree		Slightly agree	Agree
0	1	2	3	4

Appendix C: Drinking Motives Questionnaire—Revised Short Form

In the last 12 months, how often did you drink…

1. To fit in with a group you like?

Never	Some of the Time	Half of the Time	Most of the Time	Almost Always
1	2	3	4	5

2. To be liked?

Never	Some of the Time	Half of the Time	Most of the Time	Almost Always
1	2	3	4	5

3. So you won't feel left out?

Never	Some of the Time	Half of the Time	Most of the Time	Almost Always
1	2	3	4	5

4. Because it helps you when you feel depressed or nervous?

Never	Some of the Time	Half of the Time	Most of the Time	Almost Always
1	2	3	4	5

5. To cheer you up when you're in a bad mood?

Never	Some of the Time	Half of the Time	Most of the Time	Almost Always
1	2	3	4	5

6. To forget about your problems?

Never	Some of the Time	Half of the Time	Most of the Time	Almost Always
1	2	3	4	

Appendix D: Scatterplots of Variables

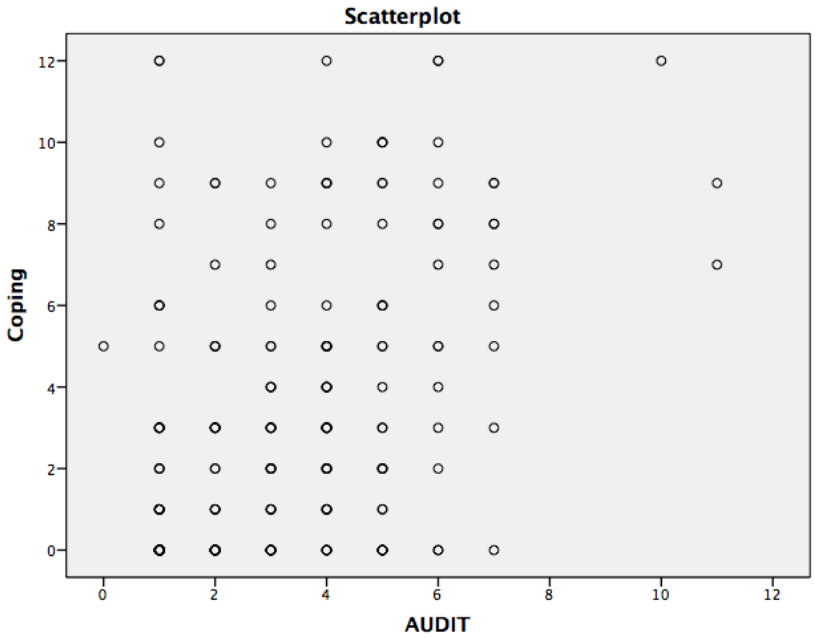

Figure D1. Scatterplot of AUDIT and coping.

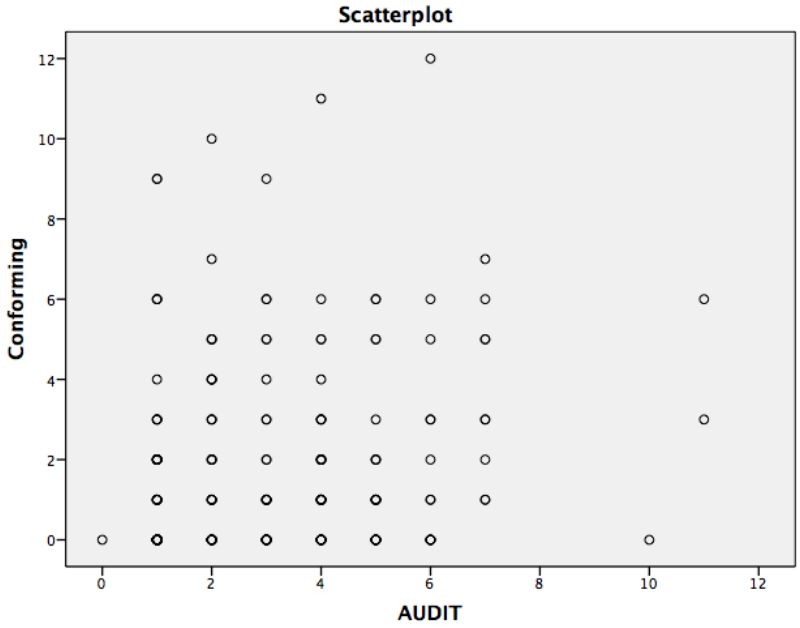

Figure D2. Scatterplot of AUDIT and conforming.

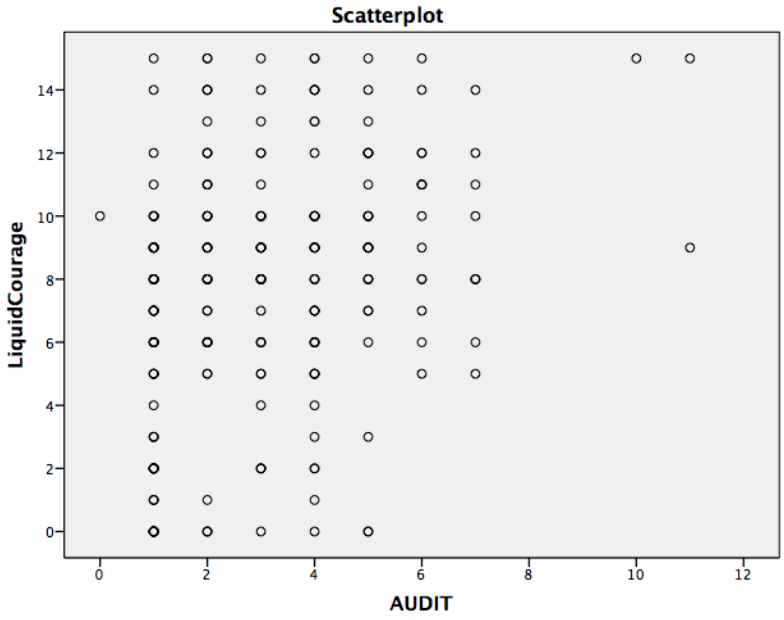

Figure D3. Scatterplot of AUDIT and liquid courage.

Appendix E: Q-Q Plots of Variables

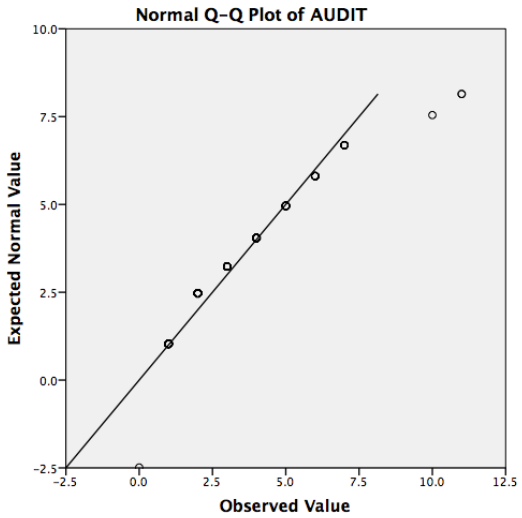

Figure E1. Q-Q plot of AUDIT, demonstrating normality.

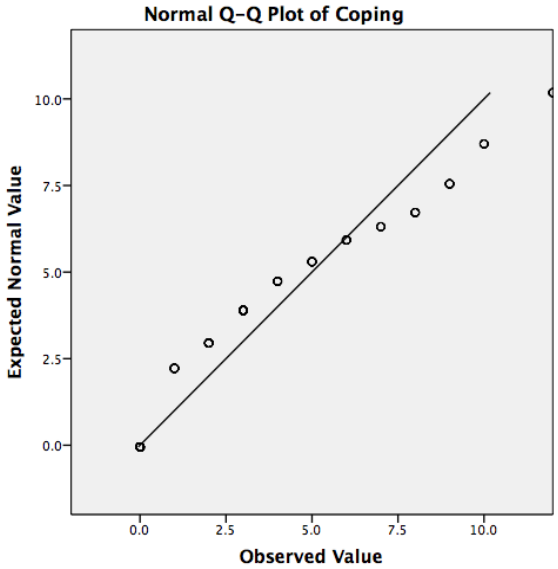

Figure E2. Q-Q plot of coping, demonstrating normality.

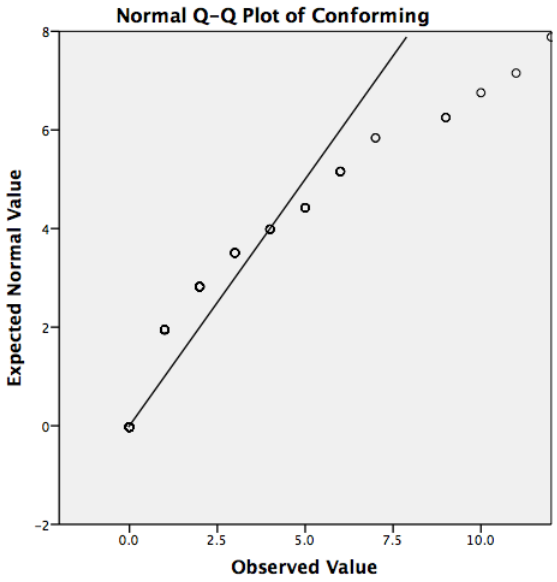

Figure E3. Q-Q plot of conforming, not demonstrating normality.

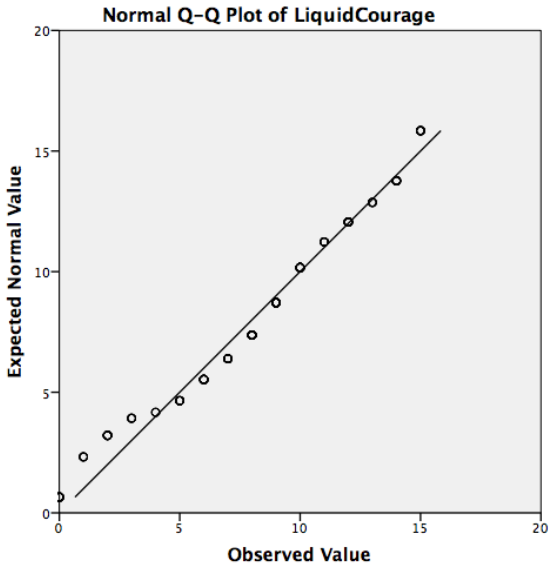

Figure E4. Q-Q plot of liquid courage, demonstrating normality.

Appendix F: Histogram and P-Plot of Regression Standardized Residual

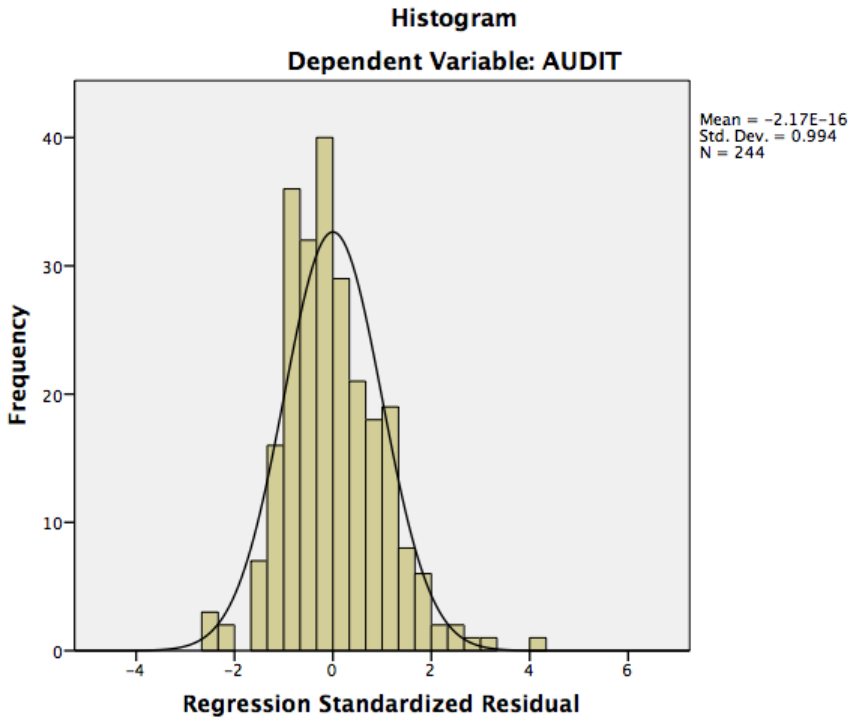

Figure F1. Histogram of residual.

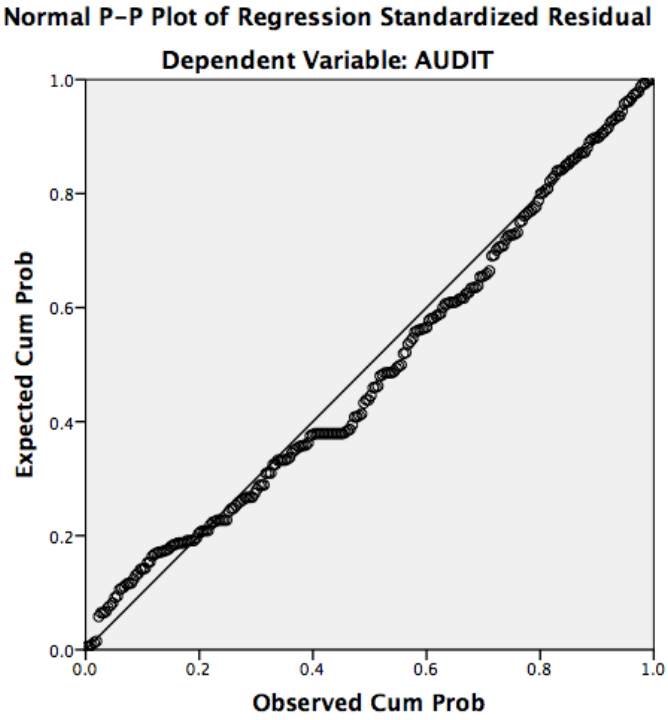

Figure F2. Normal P-P plot of residual.

Appendix G: Assumption of Heteroscedasticity: Scatterplot of Standardized Residual and Standardized Predicted Value