Hazardous drinking among university students remains a significant public health crisis on college campuses. According to the Core Institute (2012), nearly 44% of college students reported heavy episodic drinking during the previous two weeks. Alcohol use results in numerous problems experienced by college students, including impaired driving and death (Hingson, Zha, & Weitzman, 2009). In response, there has been a call within the literature to develop theoretically derived mediation models to investigate the complex array of variables that influence collegiate drinking behaviors (Baer, 2002; Oei & Morawska, 2004). By examining the multiple pathways of alcohol use, tailored interventions can be designed that target appropriate contributing factors for high-risk drinking groups (Dowdall & Wechsler, 2002).

The purpose of this study was to test a model of collegiate drinking comprised of several key determinants of alcohol use: descriptive norms, injunctive norms, positive alcohol outcome expectancies, negative alcohol outcome expectancies, and four types of drinking motives (coping, conformity, social reinforcement, and enhancement). The motivational model of alcohol use (Cox & Klinger, 1988, 2011) was used as a framework for conceptualizing the unique role that each variable played in contributing to drinking outcome variables (alcohol use intensity and alcohol-related negative consequences). It was posited that drinking motives would fully mediate the associations between psychosocial determinants of drinking (social norms and alcohol outcome expectancies) and drinking outcome variables.

Path analysis was utilized to examine associations among the variables and to assess the fit of the hypothesized model with a sample of 445 full-time undergraduates between the ages of 18 and 24 years old. A final, revised model accounted for 45% of the variance in both alcohol use intensity and alcohol-related negative consequences. Whereas enhancement drinking motives and social norms variables emerged as important predictors of alcohol use intensity, negative drinking motives acted as key predictors of alcohol-related negative consequences. Results of bootstrapping analyses indicated that drinking motives significantly mediated the indirect relationships between several psychosocial determinants and drinking outcome variables. Multiple group tests of invariance indicated that the revised model was an acceptable fit among male and female students as well as underclassmen and upperclassmen. Several implications for counselors and counselor educators were gleaned from the results. In the future, researchers should design and evaluate targeted interventions that are tailored for college drinkers based on their primary motives for alcohol consumption.

PERCEIVED NORMS, ALCOHOL OUTCOME EXPECTANCIES, AND

COLLEGIATE DRINKING: EXAMINING THE MEDIATING

ROLE OF DRINKING MOTIVES

by

Edward Wahesh

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Approved by

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APPROVAL PAGE

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Ad Majorem Dei Gloriam

Writing this dissertation has been a journey that I did not walk alone. As I look over this document, I am filled with great pride and am overwhelmed with gratitude for all those people in my life who have encouraged me throughout this process. Before describing those who have helped me during this journey, I want to begin by recognizing the Society of Jesus, also known as the Jesuits. These Catholic priests, and the laypersons inspired by their approach to education, played an important role in my educational and personal development. Specifically, these educators instilled the belief in me that I not only could, but should make a difference in the world. Early on in my educational career, I was taught to write a phrase in the heading of any important paper as a way to signify the purpose of the work. Hence, I began this section with the Latin motto of the Jesuits, translated as "For the Greater Glory of God," as a way to demonstrate my gratitude for the experiences that have led me to this point in my life and to emphasize my desire to engage in work that has a greater purpose.

From start to finish, the process of writing my dissertation would not have been possible without the support of my committee. Since I first started writing, Dr. Lewis has shown tremendous flexibility, encouragement, and patience throughout the process. The approach that Dr. Lewis has taken, including his balance of both sense of humor and high expectations, has been a model for student mentoring that I will strive to emulate as a counselor educator. Dr. DiAnne Borders also played an instrumental role in this process.

me to reach my ambitious goal of having close to 500 participants in my study. Further, without the five hundred and thirty eight students who agreed to participate, this dissertation study would not have been possible. I am greatly appreciative of the time and effort that these students put into completing my survey.

Finally, this acknowledgements section would not be complete without thanking my family who walked with me on this journey. In particular, I would like to thank my parents, who made great sacrifices to ensure that I was able to pursue my educational and life goals. Further, both my brother, Eli, and my sister, Vanessa, have played an important role in my personal development and greatly influenced how I am in my professional life. Finally, I want to express sincere gratitude to my wife, Rachel. She has made many sacrifices along the way, including leaving her dream job to move to Greensboro and financially support me as I returned to school. As I look back, I can say with no reservations that none of this would have been possible without her love and support. Rachel, I love you very much and hope that you recognize that this work, and any other accomplishment I have, is because of you.

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CHAPTER I

INTRODUCTION

Excessive alcohol consumption is a pervasive problem on college campuses. According to the Core Institute (2012), over 82% of college students consumed alcohol during the past year and among these students, nearly 44% reported heavy episodic drinking (five or more drinks in a sitting) during the previous two weeks. Alcohol use does not appear to be restricted to those college students over the minimum legal drinking age. Although underage students consume alcohol less frequently than their peers above the minimum legal drinking age, when they do drink they are more likely to engage in heavy drinking (Wechsler, Lee, Nelson, & Kuo, 2002). Rates of heavy drinking among college students are higher in comparison to young adults (18 to 24 years old) not enrolled in college (Johnston, O'Malley, Bachman, & Schulenberg, 2012) and place undergraduates at risk for alcohol-related negative consequences (Wechsler, Lee, Nelson, et al., 2002).

The staggering rates of problems linked to college student drinking present a bleak picture. Among college drinkers, nearly 35% reported some form of public misconduct (i.e., fighting, DWI, vandalism) and 23% reported experiencing some kind of serious personal problem, such as suicidal ideation, injury, or sexual assault during the past year (Core Institute, 2012). Despite efforts to prevent harmful collegiate drinking, rates of negative consequences have not declined (NIAAA, 2007; Wechsler, Lee, Kuo, et

al., 2002). In a study of hospital entry rates for alcohol and drug overdoses, White, Hingson, Pan, and Yi (2011) found that among traditional college age adults (ages 18-24) hospitalization rates of acute alcohol intoxication and alcohol-related injury increased 25% from 1999 to 2008. Furthermore, the percentage of unintentional alcohol-related injury deaths increased 3% (from 1,442 to 1,825) per 100,000 college students aged 18 to 24 years old from 1998 to 2005 (Hingson, 2010).

Among undergraduates, male students are more likely to engage in heavy episodic drinking (i.e., five or more drinks in a sitting for men and four or more drinks in a sitting for women) compared to their female counterparts (Wechsler, Lee, Nelson, et al., 2002). Recent data, however, have indicated that the gender gap in alcohol use among college students has decreased. Johnston et al. (2012) reported that from 1998 through 2008 there was a closing of the gender gap in heavy episodic drinking, as the rate among college females rose from 31% in 1998 to 34% in 2008, while it declined, from 52% to 49%, among college males. Although female college students continue to report lower rates of heavy drinking compared to male students, due to physiological differences (e.g., women achieve higher blood alcohol concentrations than men at equivalent consumption levels) they are at a greater risk for several negative consequences, such as blacking out and getting injured (Sugarman, DeMartini, & Carey, 2009). Further, female college students report higher rates of alcohol-related sexual assault than male students (Howard, Griffin, & Boekeloo, 2008).

First-year students are another population on college campuses who appear to be particularly susceptible to negative consequences due to heavy drinking (Borsari,

Murphy, & Barnett, 2007). In one study of first-year student drinking, approximately 1 in 5 males had consumed ten or more drinks and 1 in 10 females had consumed eight or more drinks at least once in the past two weeks (White, Krauss, & Swartzwelder, 2006). In a national study of college student drinking, Harford, Wechsler, and Muthén (2002) found that first-year students reported higher rates of disruptive behaviors, such as damaging property, having trouble with the police, and getting hurt or injured compared to upperclassmen. The first-year of college represents a unique time of transition for young adults, which may explain this period of heightened risk for drinking and negative consequences. To explain the rates of alcohol consumption and negative consequences among college students, several theories regarding social, cognitive, and motivational influences have been discussed within the literature.

Peer influence is a powerful determinant of collegiate drinking behaviors. More specifically, indirect peer influence or perceived social norms explain considerable variation in drinking and the occurrence of negative consequences among college students (Borsari & Carey, 2001). Two types of social norms have been assessed within the collegiate drinking literature, descriptive norms and injunctive norms (Borsari & Carey, 2003). Descriptive norms are the perception of other's quantity and frequency of drinking, whereas injunctive norms reflect the perceptions of others' approval of drinking. When college students overestimate the levels of permissiveness and use by their peers, they increase their own use so that it adheres to the misperceived norms. Students are impacted most by normative groups with whom they share similarities; therefore, the influence of social norms tends to increase as a function of how close a

reference group of peers is to the student. As such, norms related to the "typical college student" tend to have less of an impact on drinking than norms of one's "closest friend." Stated differently, the greater the proximity of the reference group, the greater the impact on drinking (Borsari & Carey, 2003).

In addition to studying the social factors that influence drinking, researchers also have examined the role that beliefs about the anticipated chemical effects of alcohol play in collegiate drinking behaviors. Alcohol outcome expectancies have been linked to alcohol use and occurrence of negative consequences among college students (Baer, 2002). Outcome expectancies are beliefs about the effects of alcohol. According to expectancy theory (Fromme, Stroot, & Kaplan, 1993), beliefs in the positive effects of alcohol (i.e., tension reduction, liquid courage) encourage drinking behaviors, whereas beliefs that drinking produces undesirable or negative effects (i.e., cognitive impairment, risk and aggression) discourages alcohol use. Considerable research has indicated that both positive and negative outcome expectancies are positively associated with drinking and alcohol problems (Hasking, Lyvers, & Carlopio, 2011; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Sher, Wood, Wood, & Raskin, 1996) suggesting that the perceived effects of alcohol grouped together by researchers as "negative" actually are outcomes desired by some collegiate drinkers. When examined together, beliefs about the negative effects of alcohol play an important role in explaining collegiate drinking. Valdivia and Stewart (2005) found that negative outcome expectancies improve prediction of drinking behavior and alcohol problems above-and-beyond that of positive expectancies. It has been argued that beliefs about the desired effects of alcohol influence

drinking behaviors indirectly by increasing motivation to consume alcohol (Jones, Corbin, & Fromme, 2001).

Drinking motives represent the value placed on the desired effects of alcohol and are assumed to be the final common path to alcohol use in which more distal influences (i.e., perceived norms, outcome expectancies) are mediated (Cox & Klinger, 1988, 2011). Motives for drinking have been conceptualized along two dimensions: valence (positive or negative) and source (internal or external) of expected effect (see Figure 1).

Valance

	Positive	Negative
Internal	Drinking to enhance positive mood	Drinking to reduce negative emotions
External	Drinking to obtain social rewards	Drinking to avoid social rejection

Source of Expected Effects
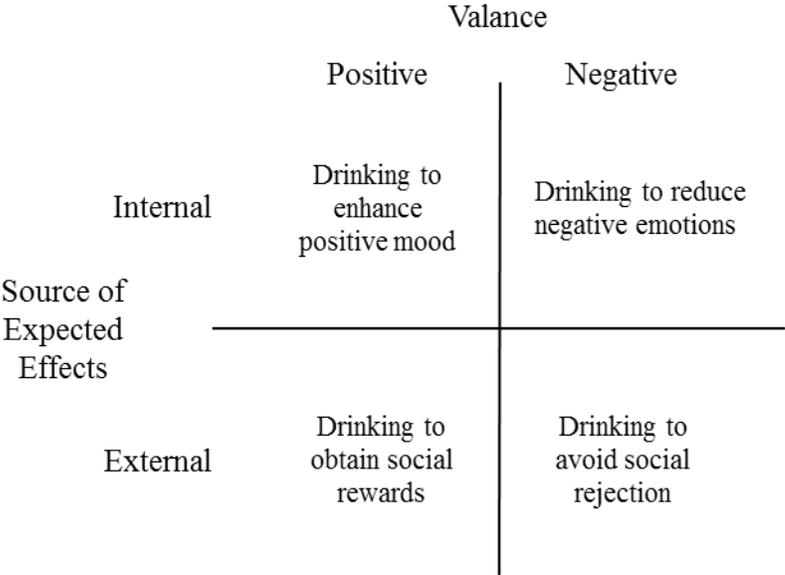
Adapted from Cox and Klinger (2011)

Figure 1. Depiction of drinking motives by source and valence.

Crossing these dimensions yields four categories of motives: (a) internally generated, positive reinforcement motives; (b) externally generated, positive reinforcement motives; (c) externally generated, negative reinforcement motives; and (d) internally generated, negative reinforcement motives. These motives, operationalized as

enhancement, social, conformity, and coping (Cooper, 1994), have been associated with alcohol use in both adolescent (Cooper, Frone, Russell, & Mudar, 1995) and collegiate (Martens, Rocha, Martin, & Serrao, 2008; Merrill & Read, 2010) samples. Negative motives (coping and conformity) have been found to have a direct relationship with alcohol problems, whereas positive motives (social and enhancement) have been found to have an indirect association with alcohol problems via consumption (Kuntsche, Wiers, Janssen, & Gmel, 2010; Merrill & Read, 2010).

Social norms, alcohol outcome expectancies, and drinking motives are robust predictors of collegiate drinking, yet there are few examples within the literature of these constructs tested together to examine the intensity of alcohol use and negative consequences. Indeed, few researchers have studied multiple domains of influence (i.e., peer influences, cognitive processes, and motivational structures) simultaneously to observe how they interact and to identify their relative contribution to predicting alcohol use (Neighbors et al., 2007). Past investigators have focused on providing descriptive accounts of how specific etiological factors influence drinking behaviors. Knowledge from this research contributes relatively little to prevention and intervention efforts because it does not account for the complex associations between various domains of influences. This has resulted in the development of intervention strategies that are overly generalized or have no theoretical underpinnings to guide counselors in how to target relevant risk factors (Oei & Morawska, 2004).

Statement of the Problem

Despite increased prevention efforts and a growing body of research on collegiate drinking, rates of alcohol use and alcohol-related negative consequences on college campuses have shown no sign of decline. Behaviors such as heavy episodic drinking and driving while intoxicated among college students have actually increased since 1998 (NIAAA, 2007). These trends are troubling but not surprising given the questionable effectiveness of current prevention and intervention efforts designed to reduce collegiate drinking. A meta-analytic review of 62 empirical studies on individual-focused college drinking interventions conducted by Carey, Scott-Sheldon, Carey, and DeMartini (2007) revealed that interventions designed to reduce collegiate drinking yielded small-to-moderate effect sizes that diminished over time and that these interventions were less successful in reducing alcohol problems among heavy drinkers. These authors suggested that future approaches be designed to target the specific contextual and personal factors that influence alcohol use among heavy drinkers (Carey et al., 2007). In a qualitative review of collegiate prevention and treatment interventions, Larimer and Cronce (2007) reported findings similar to those by Carey et al. (2007) and recommended that future researchers investigate how to design and disseminate tailored interventions that account for the various determinants of alcohol use among college student drinkers.

Critics have argued that collegiate drinking research has not made an impact on the drinking habits of college students because investigators have failed to employ a coherent theoretical approach in examining the complex array of variables that influence drinking behaviors (Burke & Stephens, 1999; Oei & Morawska, 2004). In response,

there has been a mounting call within the field to develop conceptual and explanatory models to examine collegiate drinking behaviors (Oei & Morawska, 2004). In a review of the college drinking literature, Baer (2002) reported that there was a need for multivariate research that tests mediation models of the many etiological factors related to drinking that have been studied separately. By examining the pathways of college student drinking, researchers and counselors can design interventions that target appropriate contributing factors in more meaningful and effective ways (Dowdall & Wechsler, 2002).

Purpose of the Study

The purpose of this study was two-fold. The first purpose was to test an integrative model of collegiate drinking which incorporates multiple domains of influence. Utilizing the motivational model of alcohol use proposed by Cox and Klinger (1988, 2011) as a framework, in this study I investigated the mediating role of drinking motives on the association between social norms, alcohol outcome expectancies, and drinking behavior (Figure 2). To date, no study had examined the intervening role of drinking motives on the association between unique types of social norms (descriptive and injunctive), alcohol expectancies (positive and negative) and alcohol use intensity and alcohol-related negative consequences. By identifying the motivational pathways of social norms and outcome expectancies on alcohol use and negative consequences, this research contributes to the development of targeted prevention and treatment interventions for collegiate drinkers based on specific drinking motive.

Secondly, I examined the appropriateness of the proposed integrative model by gender and first-year student status. It is well documented within the literature that male

(Wechsler, Lee, Nelson, et al., 2002) and first-year (Borsari et al., 2007) college students

report higher levels of heavy drinking and alcohol-related negative consequences;

however, it is unclear whether these higher rates are related to discrepant influences of

social norms and outcome expectancies as mediated by drinking motives. Further, no

study had examined these variables (i.e., social norms, outcome expectancies, and

drinking motives) simultaneously when investigating differences between these groups

(i.e., males and females, first-year college students and upperclassmen). A major goal of

this research was to inform both research and practice by providing insight regarding

which factors are more salient predictors of alcohol use and negative consequences

among these high-risk populations.
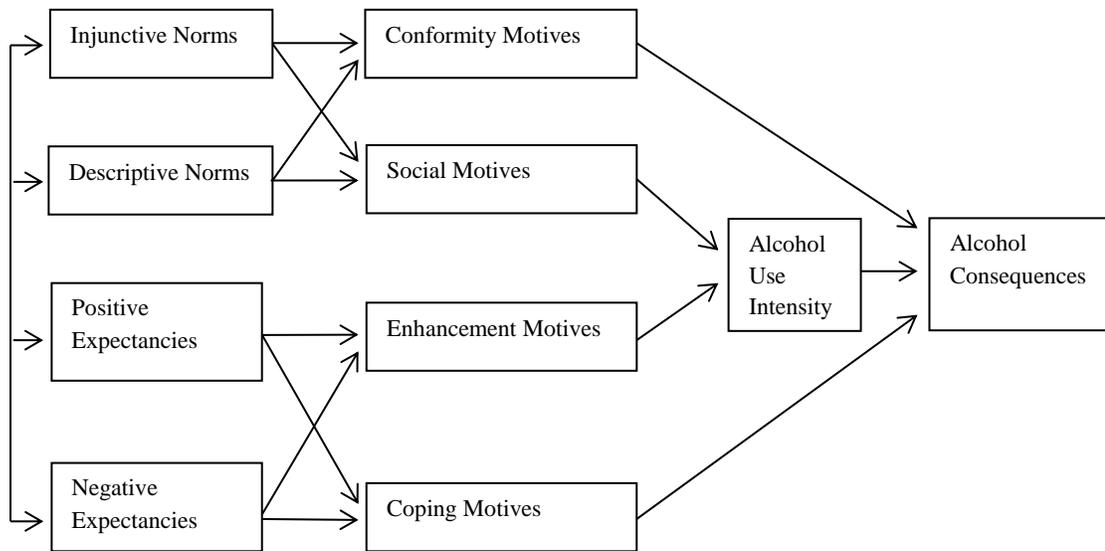
Figure 2. Proposed mediational role of drinking motives on social norms, alcohol
outcome expectancies, alcohol use intensity, and alcohol-related negative consequences.

Need for the Study

The prevalence of alcohol consumption on college campuses is concerning because of the significant impact that heavy drinking and alcohol-related negative consequences have on students. Alcohol consumption has been associated with a range of social and physical problems including college attrition (Martinez, Sher, & Wood, 2008), memory impairment (Courtney & Polich, 2009), and physical assaults (Hingson, Zha, & Weitzman, 2009). These consequences result in many college student drinkers seeking treatment. Indeed, nearly half (46.6%) of all substance abuse treatment admissions among college students in 2009 were for alcohol abuse (SAMHSA, 2012). Given these rates, coupled with the questionable effectiveness of current treatment approaches (Carey et al., 2007), continued research is warranted to provide a more thorough understanding of how the various social, cognitive, and motivational factors contribute to the initiation and maintenance of problematic alcohol use.

The motivational model of alcohol use provides a promising framework for studying multiple determinants of collegiate drinking behavior and designing prevention and intervention strategies. Cox and Klinger (1988, 2011) have posited that environmental and personal factors influence alcohol use behaviors through drinking motives. Internal motives serve as a conduit for beliefs associated with the chemical effects of alcohol use (i.e., outcome expectancies) and external motives serve as a pathway for beliefs related to the instrumental effects (i.e., peer acceptance) of drinking. Specific types of drinking motives predict particularly hazardous use of alcohol; conformity and coping motives, both associated with regulation of negative affect, have

been found to be directly related to alcohol use consequences (Kuntsche et al., 2010; Merrill & Read, 2010).

Confirming these motivational pathways will enable researchers and counselors to develop targeted multicomponent prevention and intervention efforts based on specific drinking motives. For instance, if a student's primary drinking motive is social reinforcement, intervention components related to peer influence, such as descriptive norms clarification (McNally, Palfai, & Kahler, 2005) and enhancing helping relationships (Velasquez, Maurer, Crouch, & DiClemente, 2001) may be incorporated into treatment. Although past researchers have found some support for the mediational role of motives in explaining the relationship between social and cognitive factors and alcohol use behaviors (Read, Wood, Kahler, Maddock, & Palfai, 2003), no study has examined injunctive norms, descriptive norms, negative alcohol outcome expectancies, positive alcohol outcome expectancies, and the four drinking motives in a single model to explain alcohol use intensity and alcohol-related negative consequences.

Research Questions

Based on a review of the relevant literature, the following research questions will serve as a guide for this study:

Research Question 1: Does the integrative model of collegiate drinking based on the motivational model of alcohol use (Cox & Klinger, 1988, 2011) provide an acceptable fit for the data?

Research Question 2: How well do social norms (descriptive and injunctive) predict external (social reinforcement and conformity) drinking motives?

Research Question 3: How well do alcohol outcome expectancies (positive and negative) predict internal (coping and enhancement) drinking motives?

Research Question 4: How well do positive drinking motives (social and enhancement) predict alcohol use intensity?

Research Question 5: How well do negative drinking motives (conformity and coping) predict alcohol-related negative consequences?

Research Question 6: How well do conformity motives mediate the relationship between social norms variables (descriptive and injunctive norms) and alcohol-related negative consequences?

Research Question 7: How well do coping motives mediate the relationship between alcohol outcome expectancies (positive and negative) and alcohol-related negative consequences

Research Question 8: How well do social motives mediate the relationship between social norms variables (descriptive and injunctive norms) and alcohol use intensity?

Research Question 9: How well do enhancement motives mediate the relationship between alcohol outcome expectancies (positive and negative) and alcohol use intensity?

Research Question 10: How well does alcohol use intensity mediate the relationship between social and enhancement motives and alcohol-related negative consequences?

Research Question 11: Does the motivational model of alcohol use (Cox & Klinger, 1988, 2011) provide an acceptable fit for both male and female college students?

Research Question 12: Does the motivational model of alcohol use (Cox & Klinger, 1988, 2011) provide an acceptable fit for both first-year and upper class college students?

Definition of Terms

For the purposes of the present study, the following definitions were used to operationalize key constructs:

<u>Alcohol use intensity</u> represents an individual's level of drinking intensity as measured by frequency of use, quantity of use, and frequency of heavy episodic drinking during the past year. In most research on collegiate alcohol use, heavy episodic drinking has been defined as consuming five drinks or more on an occasion for men or four drinks or more on an occasion for women (Courtney & Polich, 2009). However, in 2004 heavy episodic drinking was defined by the National Institute of Alcohol Abuse and Alcoholism as:

> A pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0.08 gram percent or above. For the typical adult, this pattern corresponds to consuming 5 or more drinks (male), or 4 or more drinks (female), in about 2 hours. (p. 3)

In an ensuing study comparing the .08% BAC definition and the 5/4 drinks on an occasion definition, Fillmore and Jude (2011) determined that the 5/4 drinks definition provided optimal sensitivity and specificity in detecting alcohol-related negative consequences among college students. In light of these findings, for the purposes of this study, heavy episodic drinking was defined as five drinks or more on an occasion for men or four drinks or more on an occasion for women. Alcohol use intensity was measured using the three item Alcohol Use Disorder Identification Test—Consumption (AUDIT—C; Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998). Higher scores reflect more

intense involvement with alcohol. The responses from these questions were summed to provide an overall scale score of alcohol use intensity.

Alcohol-related negative consequences are problems associated with alcohol consumption. Examples of alcohol-related consequences include social-interpersonal, academic/occupational, impaired control, engagement in high risk-behaviors, and experience of physiological dependence symptoms. For the purposes of this study, alcohol-related negative consequences was measured by the Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ; Kahler, Strong, & Read, 2005). The responses from this instrument were summed to provide an overall scale score of alcohol-related negative consequences.

Positive alcohol outcome expectancies are beliefs about the positive effects of alcohol consumption. Fromme et al. (1993) identified four categories of positive outcome expectancies: liquid courage, sexuality, tension reduction, and sociability. For the purposes of the present study, positive alcohol outcome expectancies were measured as a single composite variable using the Comprehensive Effects of Alcohol Questionnaire (CEOAQ; Fromme et al., 1993).

Negative alcohol outcome expectancies are beliefs about the negative effects of alcohol consumption. Fromme et al. (1993) identified three categories of negative outcome expectancies: cognitive/behavioral impairment, risk/aggressiveness, and negative self-perception. For the purposes of the present study, negative alcohol outcome expectancies were measured as a single composite variable using items from the

cognitive/behavioral impairment, negative self-perception, and risk/aggressiveness subscales of the Comprehensive Effects of Alcohol Questionnaire (Fromme et al., 1993).

Descriptive social norms refer to the perceived prevalence of a particular behavior. For the purposes of the present study, descriptive norms referred to the perceived prevalence of alcohol use intensity by typical students of the same sex at the participant's University. This reference group was selected based on past research that indicates typical student same-sex social norms are a robust predictor of personal alcohol use among college students (Neighbors et al., 2008). In this study, items adapted from the Alcohol and Drug Survey (Thombs, 1999) were used to measure perceived prevalence of frequency of use, quantity of use, and frequency of heavy episodic drinking. The responses from these questions were summed to provide an overall descriptive social norms score.

Injunctive social norms refer to the perceptions of how much others approve of a particular behavior. In the present study, injunctive social norms referred to the approval of alcohol use by the participant's friends and were measured using an instrument developed by Baer (1994). Items asked about perceived approval of drinking alcohol every weekend, driving a car after drinking, drinking alcohol daily, and drinking enough to pass out. The items were averaged to create a single variable representing participants' perceptions of friends' overall approval of alcohol use.

Drinking motives refer to an individual's reasons for alcohol consumption. According to Cox and Klinger (1988, 2011) there are four discrete categories of drinking motives: (a) internally generated, positive reinforcement motives (drinking to enhance

positive mood); (b) externally generated, positive reinforcement motives (drinking to obtain social rewards); (c) externally generated, negative reinforcement motives (drinking to avoid social rejection); and (d) internally generated, negative reinforcement motives (drinking to reduce negative emotions). These motives were operationalized by Cooper (1994) as enhancement, social, conformity, and coping.

Coping motives refer to drinking to reduce negative affect.

Conformity motives refer to drinking to avoid social rejection.

Social motives refer to drinking to obtain social rewards.

Enhancement motives refer to drinking to enhance positive mood.

In the present study, drinking motives were measured using the Drinking Motives Measure-Revised (Cooper, 1994). The DMM-R contains 20 items organized into four subscales (five items each) representing the four drinking motives proposed by Cox and Klinger (1988, 2011). The responses from these items were summed to provide four separate drinking motive scores.

College student is defined as a full-time undergraduate student between the ages of 18 and 24 attending a four year institution. According to University policy ("Summary of Undergraduate Academic Requirements," n.d.), full-time enrollment status is achieved when undergraduate students are enrolled in at least 12 credit hours. Therefore, for the purposes of the current study, college students were those undergraduates between the ages of 18 and 24 who were enrolled in at least 12 credit hours.

First-year student is defined as a student who has completed less than the equivalent of one full year of undergraduate studies. Correspondingly, the term

upperclassmen is defined as a student with one full year or more of undergraduate studies and includes students traditionally referred to as sophomores, juniors, and seniors.

Brief Overview

This study is presented in five chapters. Chapter One has included an overview of the problem as well as research related to social norms, alcohol outcome expectancies, drinking motives, and collegiate drinking behaviors. Further, the purpose of the study, statement of the problem, research questions, need for the study, and definition of terms are provided. Chapter II details the research relevant to existent collegiate drinking prevention and treatment as well as the variables in the study, including social norms (descriptive and injunctive), drinking motives (coping, conformity, social, and enhancement), alcohol outcome expectancies (positive and negative), and collegiate drinking. In Chapter III, the methodological approach and data analysis procedures are described. This chapter also includes research hypotheses, a description of participants, instrumentation, and data collection procedures. Chapter IV provides an overview of the results of the study. Finally, Chapter V contains the conclusions drawn from the study as well as a discussion of the implications for professional counselors working with college students and recommendations for future research.

CHAPTER II

REVIEW OF RELEVANT LITERATURE

In Chapter I, the purpose and specific research questions of the current study were presented. In this chapter, the prevalence of collegiate drinking and alcohol-related negative consequences, as well as the sociodemographic factors that influence these rates are examined. An overview of current individual-focused efforts at prevention and treatment of collegiate drinking is presented. Theories of collegiate drinking, including social norms theory, outcome expectancy theory, and the motivational model of alcohol use are discussed. Research combining multiple domains of collegiate drinking to explain alcohol use intensity and alcohol-related negative consequences is explored. The chapter concludes with a summary of the literature reviewed which emphasizes the need for further research of the relationships among social norms, alcohol outcome expectancies, drinking motives, alcohol use intensity, and alcohol-related negative consequences.

Scope of the Problem

To grasp the need for continued research on collegiate drinking, it is necessary to delve into the troubling impact that alcohol consumption has on young adults enrolled in college. Nearly 70% of college students in the United States have consumed alcohol in the past 30 days (Core Institute, 2012). Alcohol consumption places students at risk for a myriad of harmful consequences that result in an alarmingly high percentage of undergraduates who met the diagnostic criteria (APA, 1994) for an alcohol use disorder

(Knight et al., 2002). Rates of alcohol use intensity and alcohol-related negative

consequences appear to be moderated by a number of social and demographic factors

(Baer, 2002). In this section, I will examine the rates of drinking and alcohol-related

negative consequences on college campuses. I will also discuss the various factors that

influence these rates. This analysis of the prevalence of alcohol use and alcohol-related

consequences, along with the sociodemographic correlates of collegiate drinking, set the

context to explore current efforts at prevention and treatment.

Prevalence of Collegiate Drinking

To present a comprehensive overview of the prevalence of alcohol consumption

by college students, it is critical to examine this behavior on multiple levels. This

includes assessing both the frequency (i.e., how often alcohol is consumed) and quantity

(i.e., how many alcohol beverages are consumed per occasion) of use. Heavy episodic

drinking, defined as five or more drinks in a sitting for men and four or more drinks in a

sitting for women (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994),

characterizes a style of alcohol consumption that places college drinkers at increased risk

for alcohol-related negative consequences (Wechsler & Nelson, 2001). Describing each

of these various aspects of collegiate drinking helps to shape what seemingly is an

overwhelming epidemic on college campuses and provides insight into the occurrence of

alcohol-related negative consequences. An overview of drinking frequency, drinking

quantity, and rates of heavy episodic drinking are presented here.

Quantity and frequency of alcohol use. The rates of alcohol use by young adults

enrolled in college are staggering. Nationally, over 82% of college students reported

alcohol use in the past year and nearly 70% consumed alcohol during the past two weeks

(Core Institute, 2012). Overall, the average number of drinks consumed per week by

college students was 4.6 drinks (Core Institute, 2012). However, in a separate national

survey of college drinking habits, when students were asked to report the number of

drinks consumed the last time they "partied" or socialized, the average number of drinks

consumed by male and female college drinkers was 6.31 and 4.16, respectively (ACHA,

2012). These rates indicate that many students "binge" or engage in heavy episodic

drinking when involved in situations where alcohol is present.

      Heavy episodic drinking. The term heavy episodic drinking, initially referred to

as "binge drinking," was coined by Wechsler et al. (1994) in order to describe the

"consumption of a sufficiently large amount of alcohol to place the drinker at increased

risk of experiencing alcohol-related problems" (Weschler & Nelson, 2001, p. 287).

Defined as five or more drinks in a sitting for men and four or more drinks in a sitting for

women (Wechsler et al., 1994), heavy episodic drinking rates are higher among college

students (aged 18-24) than any other age group in the United States (Johnston et al.,

2012). Reported occasions of heavy episodic drinking are more frequent among

undergraduates in comparison to their peers not enrolled in college (Johnston et al.,

2012). According to the Core Institute (2012), in 2011 nearly 44% of college students in

the United States reported heavy episodic drinking during the past two weeks. Despite

increased attention paid to collegiate alcohol use over the past two decades by

government agencies, campus administrators, and college counselors, the rates of heavy

drinking have not declined (NIAAA, 2007; Wechsler, Lee, Kuo, et al., 2002). Indeed,

from 1999 to 2005 the proportion of college students aged 18-24 years old who

consumed five or more drinks in a row during the past 30 days increased from 41.7% to

45.2% (Hingson, 2010).

Most college students have consumed alcohol within the past year and nearly half

of all undergraduates reported consuming alcohol at rates that expose them to alcohol-

related negative consequences (Core Institute, 2012). Describing just the prevalence of

alcohol use, however, fails to put the problem of collegiate drinking into perspective. To

gain a complete picture of the problem, it is important to examine the harmful effects

associated with drinking. In the next section, I will provide an overview of the various

physical, interpersonal, and academic alcohol-related negative consequences experienced

by collegiate drinkers.

Negative Consequences of Collegiate Drinking

The term "alcohol-related negative consequences" refers to the myriad of possible

problems that can result from alcohol consumption by college students. According to

Ham and Hope (2003), in order to provide a comprehensive overview of the problem of

collegiate alcohol use, both drinking rates (e.g., quantity, frequency) and alcohol-related

negative consequences must be described. The prevalence of alcohol-related negative

consequences among college students presents a bleak picture of collegiate drinking.

Nationally, over one third (34.8%) of college students reported some form of public

misconduct and nearly one in four (23.1%) students reported some kind of serious

personal problem, such as being hurt or injured, attempting suicide, and sexual assault

during the past year (Core Institute, 2012). Further, over 50% of college students

reported experiencing at least one alcohol-related consequence during the past 12 months (ACHA, 2012).

Interpersonal and academic consequences. The consumption of alcohol by college students can result in a variety of interpersonal and academic negative consequences. Among college drinkers, 28% reported that they had been criticized because of their alcohol use and nearly 30% reported getting into an argument or fight due to consumption during the past year (Core Institute, 2012). In addition to these social concerns, many college students have reported academic consequences, 26% reported missing a class due to drinking and nearly 20% reported that they performed poorly on a test or important project because of alcohol consumption during the past year (Core Institute, 2012). Heavy drinking has been regarded as a significant contributor to collegiate attrition (i.e., withdrawal from college prior to graduation). In a 4-year longitudinal study of collegiate drinking behaviors, Martinez et al. (2008) determined that heavy drinking predicted attrition. In addition to heavy drinking, arrests for driving under the influence (DUI) of alcohol have been found to predict attrition rates among college students (Thompson & Richardson, 2008).

Physical consequences. Alcohol is a central nervous system depressant that, when consumed in large quantities or at high rates, produces dramatic physiological outcomes. Over 60% of college students reported experiencing a hangover during the past 12 months (Core Institute, 2012). A hangover is a result of drinking that affects the gastrointestinal tract, blood sugar concentrations, and sleep patterns (Swift & Davidson, 1998). Heavy drinking also can result in nausea or vomiting; among college students,

over 51% reported experiencing these symptoms during the past year (Core Institute, 2012). Experiencing a blackout, or alcohol-induced memory impairment, is another relatively common occurrence among college students, with 28.8% of undergraduates reporting that they had forgotten where they were or what they did when drinking alcohol during the past 12 months (ACHA, 2012). This is alarming given the recent findings by Mundt and Zakletskaia (2012) that blackouts are a strong predictor of emergency department visits for college student drinkers. In addition to these immediate outcomes of heavy drinking, regular heavy episodic drinking among young adults has been associated with neurocognitive deficits and memory operations impairment (Courtney & Polich, 2009; Zeigler et al., 2005).

The impact of heavy drinking on cognitive processing and psychomotor skills creates dangerous conditions for inebriated drivers. Hingson et al. (2009) estimated that over three million (3,360,000) college students drove under the influence in 2005. Recent epidemiological studies of collegiate drinking suggest that impaired driving continues to be a problem among this population. Whereas only 1.1% of college students reported an arrest for driving under the influence, 21.3% admitted that they had driven a car while under the influence within the past year (Core Institute, 2012). The rates of impaired driving are troubling because of the connection between intoxicated driving and alcohol-related fatalities. According to Hingson (2010), most unintentional alcohol-related injury deaths resulted from traffic crashes involving alcohol. In 2005, there were 1,825 unintentional alcohol-related injury deaths among college students (Hingson, 2010).

Another factor in unintentional alcohol-related injuries and deaths are physical assaults. Among college drinkers, 14.3% reported that they had physically injured themselves and 2.0% reported that they had physically injured another person while consuming alcohol (ACHA, 2012). According to Hingson et al. (2009), 12% of college students were assaulted by another drinking college student in 2005. Although not as common, sexual assaults represent another profound alcohol-related negative consequence experienced by collegiate populations. Hingson et al. estimated that, in 2005, 70,000 college students (2%) experienced a date rape or sexual assault caused by another student who had been drinking. These rates are especially concerning given that many survivors of sexual assault do not report their assault or receive care. In a study of sexual assault reporting in a national sample of college students, Wolitzky-Taylor et al. (2011) found that only 2.7% of rapes involving drugs and/or alcohol were reported. Further, these authors learned that only 18.7% of rape survivors received medical attention after the rape and only 17.8% sought help or advice from an agency that offers support to victims of crime (Wolitzky-Taylor et al., 2011).

Abuse/dependence symptoms. College student drinkers who engage in heavy episodic drinking (five or more drinks in a sitting for males or four or more drinks in a sitting for females; Wechsler & Nelson, 2001) are more likely to meet the DSM-IV (APA, 1994) diagnostic criteria for an alcohol use disorder compared to undergraduates whose rate of consumption is below the threshold of heavy episodic drinking (Knight et al., 2002). In a study of the prevalence of alcohol use disorders among college students, Hagman and Cohn (2011) found that, among undergraduates who consumed alcohol

within the past 90 days, rates of abuse and dependence were 23.2% and 16.7%, respectively. Given the high rates of heavy episodic drinking and alcohol-related negative consequences among college students, it is not surprising that there are higher rates of Alcohol Abuse Disorder (a disorder characterized by continued drinking despite interpersonal, legal, or social negative consequences and role impairment; APA, 2000), among undergraduates than young adults not enrolled in college. Examining rates of alcohol abuse in a national sample of young adults (19-21 years of age), Slutske (2005) found that, compared to their non-enrolled peers, college students were more likely to receive a diagnosis of Alcohol Abuse Disorder. Meeting the criteria for an alcohol use disorder has taken a great toll on many college student drinkers; nearly half of all substance abuse treatment admissions among college students were for alcohol abuse (SAMHSA, 2012).

The alcohol-related negative consequences explored in this section are clearly a cause for concern. Researchers have identified numerous social and demographic factors that influence the rates of alcohol consumption and alcohol-related negative consequences among college students (Baer, 2002). In the following section, I will present an overview of several of these sociodemographic factors found within the literature, including race/ethnicity, activity involvement (i.e., participation in collegiate athletics or Greek life), drinking history, family history, living environment, gender, and first-year student status.

Sociodemographic Correlates of Collegiate Drinking

Since the earliest study on collegiate drinking in the United States by Straus and

Bacon (1953), researchers have identified several sociodemographic characteristics

associated with rates of alcohol use and alcohol-related negative consequences. These

sociodemographic factors include environmental, cultural, and biological influences that

place students at greater risk for alcohol consumption and alcohol-related negative

consequences (Baer, 2002). An analysis of these correlates is important because it reveals

the complexity of collegiate drinking and offers some perspective regarding the

difficulties in designing primary prevention and treatment interventions for this

population. In this section, I will describe several sociodemographic correlates of

collegiate drinking found within the literature, including race/ethnicity, drinking history,

family history, living environment, and activity involvement. I will conclude with a

discussion regarding the two interaction variables, gender differences and first-year

status, included in the study.

Race/ethnicity. Caucasian students have reported greater alcohol use intensity

compared to other college students (O'Malley & Johnston, 2002). Further, researchers

have found that Caucasian students were more likely to have consumed alcohol within

the past 30 days compared to African American college students (Ames et al., 2010) and

that Caucasian students were heavier drinkers than Hispanic students (West & Graham,

2006). Hispanic college students have been found to engage in heavy drinking at rates

greater than their African American and Asian counterparts (O'Malley & Johnston,

2002). Among Asian and African American college students, college enrollment may

serve as a protective factor against problem drinking. In a study of racial/ethnic differences in alcohol consumption in a national sample of young adults, Paschall, Bersamin, and Flewelling (2005) found an inverse relationship between college attendance and heavy alcohol use among African Americans and Asian Americans. It has been speculated within the literature that differences in drinking rates among racial/ethnic groups may be affected by cultural norms (Schwartz et al., 2011), or other moderating factors, such as level of religiosity (Paschall et al.) or family educational attainment (Sher & Rutledge, 2007), that may either promote or discourage alcohol consumption.

Drinking history. Precollege drinking has been identified as an important risk factor for collegiate drinking (Baer, 2002). In particular, age of first use of alcohol use (not counting tastes or sips) has been has been found to predict collegiate heavy drinking and alcohol-related negative consequences (Hingson & Zha, 2009). Age of first use also has been positively associated with bar-going frequency among college students (Thombs, O'Mara, Tobler, Wagenaar, & Clapp, 2009). Palmer, Corbin, and Cronce (2010) posited that earlier age of onset is problematic because the neurotoxic effects of alcohol interfere with cognitive and social development, which impairs the drinker's ability to learn effective strategies for moderating alcohol consumption. These authors found support for this hypothesis in that earlier age of onset was associated with less frequent use of alcohol-specific protective strategies by college students (Palmer et al., 2010). In addition to age of first use, quantity and frequency of high school drinking is a significant predictor of heavy episodic drinking initiation during the college years (Weitzman, Nelson, & Wechsler, 2003).

Family history. Research regarding the influence of parental drinking behaviors and attitudes on collegiate alcohol consumption has been mixed. In a study of college student drinking, West and Graham (2006) found no relationship between parental alcoholism and current alcohol use; however, research conducted by Walters, Roudsari, Vader, and Harris (2007) found that perceived parent history of alcohol abuse was negatively associated with use of alcohol-related self-protective strategies. Drinking rates among adult children of alcoholics and non-adult children of alcoholics did not differ in a study of college students by Braitman et al. (2009).

Research on the role parental attitudes play on collegiate drinking has been less equivocal. Perception of parental acceptance regarding high-risk alcohol use has been found to be a significant predictor of weekly drinking (Neighbors et al., 2007) and alcohol-related negative consequences (Abar, Abar, & Turrisi, 2009). However, Abar and Turrisi (2008) found that peer alcohol use (i.e., drinking by the student's peers) mediated the association between parental influence and college student alcohol consumption, indicating that the impact of parental attitudes and communication on individual alcohol use is complex. The genetic influence on collegiate drinking also has demonstrated support within the literature with research studies, indicating that genetic influences explain a significant proportion of variability in college alcohol consumption (Hendershot et al., 2009).

Living environment. Living arrangements appear to play an important role in explaining collegiate drinking behaviors. In a national multiyear study of collegiate drinking, Wechsler, Lee, Nelson, et al. (2002) found that drinking by both underage and

of-age students was related to their place of residence. Students who lived with their parents or substance-free housing consumed alcohol at lower rates than students residing in less controlled environments, such as in off campus housing (without parents) and fraternity or sorority houses (Wechsler, Lee, Nelson, et al., 2002). Although commuter students generally have reported lower rates of alcohol use (Presley, Meilman, & Leichliter, 2002), students who reside off campus with their parents have a higher probability of drinking and driving compared to resident students (Harford et al., 2002).

Another factor within the environment that influences collegiate drinking rates is access to alcohol. The availability of low cost alcohol within the surrounding community has been found to predict heavy episodic drinking by first-year students (Weitzman et al., 2003). Conversely, researchers have found that increased enforcement of the drinking laws by campus officials and law enforcement is associated with reductions in heavy episodic drinking (Harris, Sherritt, Van Hook, Wechsler, & Knight, 2010).

Activity involvement. In addition to the role that the physical environment plays in collegiate drinking, affiliations with particular campus social organizations are associated with alcohol use. Students who are involved in a fraternity or sorority are more likely to engage in heavy episodic drinking and experience alcohol-related negative consequences than students not affiliated with a Greek organization (McCabe et al., 2005). Among these students, male students affiliated with a fraternity have reported higher rates of alcohol-related negative consequences in comparison to sorority members as well as male students not involved in Greek life (Capone, Wood, Borsari, & Laird, 2007).

College student-athletes also have been identified as a high-risk population (Nelson & Wechsler, 2001). Considerable research has demonstrated that college student-athletes engaged in more heavy episodic drinking occasions, endorsed drinking more on peak drinking occasions (e.g., weekends, holidays), and reported getting drunk more frequently than their non-athlete peers (Turrisi, Mallett, Mastroleo, & Larimer, 2006). Further, student-athletes have reported higher rates of alcohol-related negative consequences (Nelson & Wechsler, 2001). Longitudinal studies have indicated that the intensity of college student-athlete drinking fluctuates as a function of their competitive schedule (Turrisi et al., 2006). For instance, Martens, Dams-O'Connor, and Duffy-Paiement (2006) found that alcohol use and occurrence of alcohol-related negative consequences by college student-athletes decreased during their competitive seasons. It has been posited within the literature that peer influence and drinking motives (both of which will be discussed later) play an important role in explaining the higher rates of problem drinking among college student-athletes and students affiliated with a fraternity or sorority (Turrisi et al., 2006).

Gender differences. Higher rates of heavy-episodic drinking have been documented among male college students (Engs & Hanson, 1990; McCabe et al., 2005). Even though male students have traditionally been more likely to engage in hazardous drinking compared to their female counterparts, in recent years the gender gap in alcohol consumption among college students has decreased (Kelly-Weeder, 2008). Johnston et al. (2012) reported that from 1998 through 2008 there was a closing of the gender gap in heavy episodic drinking, as the rate among college females rose from 31% in 1998 to

34% in 2008, while it declined, from 52% to 49%, among college males. Although the gap has diminished, the differences in drinking rates among male and female students are not uniform across ethnic groups. Corbin, Vaughn, and Fromme (2008) found that the gender gap was closer among Caucasian females compared to Hispanic and African American female college students.

Past research has indicated that male and female college students are at increased risk for different types of alcohol-related negative consequences (Ham & Hope, 2003). In a review of the literature, Perkins (2002) found that male college students typically had more negative consequences related to harm to others (e.g., violence and deviant public behavior) and female students typically experienced negative consequences that were more private and associated with harm to self, such as poor academic performance and unintended sex. Subsequent research by Sugarman et al. (2009) provided support to the argument that rates of alcohol-related negative consequences are influenced by gender. These authors found that, among college students, being female significantly influenced the risk for tolerance, blacking out, injury, and passing out, whereas being male increased the risk for damaging property and going to school drunk (Sugarman et al., 2009). Further, Howard et al. (2008) found that female college students reported higher prevalence of alcohol-related sexual assault than did males. A possible reason for these differences may be physiological; women achieve higher blood alcohol concentrations than men at equivalent consumption levels (White, Jamieson-Drake, & Swartzwelder, 2002).

First-year status. The first year of college has been identified as a time of increased risk for hazardous drinking (Borsari et al., 2007). In a study of first-year college student drinking conducted by White et al. (2006), approximately 1 in 5 males had consumed ten or more drinks and 1 in 10 females had consumed eight or more drinks at least once in the past two weeks. First-year students also have reported higher rates of disruptive behaviors, such as damaging property, having trouble with the police, and getting hurt or injured compared to upperclassmen (Harford et al., 2002). First-year status appears to be a risk factor independent of age; Turrisi, Padilla, and Wiersma (2000) found no difference in rates of alcohol use between first-year students 18 years or younger and "nontraditional" first-year students who were 20 years or older. It has been speculated within the literature that differences in alcohol use intensity and alcohol-related consequences among first-year students and upperclassmen are the result of unique challenges faced during the first year of college related to identity formation and the need to establish new relationships (Schulenberg & Maggs, 2002). These developmental tasks may facilitate the activation of beliefs about the positive effects of alcohol and increase the intensity of peer influence, thereby strengthening specific drinking motives that promote greater alcohol use intensity.

In this overview of collegiate drinking, the prevalence of use and alcohol-related negative consequences, as well as the various sociodemographic correlates of collegiate drinking were examined. Based on this review of the research, it is clear that drinking and alcohol-related negative consequences remains a pervasive and complex problem on college campuses. Set within this context, there are numerous prevention and treatment

interventions being utilized by professional counselors on college campuses to address

problematic drinking among undergraduates. In the following section, I will describe four

approaches to individual-level prevention and treatment. Relevant research that

underscores the current strengths and limitations of these approaches will be presented.

Prevention and Treatment Strategies of College Student Drinking

Due to the pervasiveness of alcohol use and alcohol-related negative

consequences among college students, numerous efforts have been made to address this

problem. These efforts at prevention and treatment include both in person (counselor-

delivered) and computer delivered (web-based) interventions. Despite advancements in

prevention and treatment of collegiate drinking over the past two decades, the impact of

these approaches has been limited (Wechsler, Lee, Kuo, et al., 2002; NIAAA, 2007). A

review of current interventions utilized by professional counselors on college campuses is

critical to identify areas within the research literature that require further exploration. In

the following section, I review four approaches to prevention and treatment that have

demonstrated promise in targeting alcohol use and alcohol-related negative consequences

among college students: (a) in-person brief motivational interventions; (b) standalone

personalized normative feedback interventions; (c) alcohol outcome expectancy

challenge interventions; and (d) multicomponent education-focused programs. Research

on each approach will be presented and evaluated. The section will conclude with a

review of how these findings underscore the need for the development of an integrative

explanatory model of collegiate drinking in order to enhance present prevention and

treatment efforts.

In-Person Brief Motivational Interventions

Brief motivational interventions (BMIs) have been the most widely researched and disseminated approaches to address college student drinking (Cronce & Larimer, 2011). Nearly one third of all U.S. colleges and universities reported utilizing BMIs (Foote, Wilkens, & Vavagiakis, 2010) and the National Institute for Alcohol Abuse and Alcoholism (NIAAA) listed this approach as a one of four recommended strategies to address collegiate drinking in their seminal report, *A Call to Action: Changing the Culture of Drinking at U.S. Colleges* (2002). Although this approach has shown promise in reducing alcohol use intensity and alcohol-related negative consequences within collegiate settings (Schaus, Sole, McCoy, Mullett, & O'Brien, 2009), a review of the literature reveals that BMIs possess several limitations. An in depth analysis of the outcomes research on BMIs is necessary in order to identify how this strategies can be enhanced by future research.

A BMI is an in person (clinician delivered) brief counseling intervention that incorporates assessment, personalized feedback, and motivational interviewing. Personalized feedback, based on client information obtained through assessment, can include issues associated with alcohol consumption, such as current health status, risks, experience of alcohol-related negative consequences, and comparisons with population norms (Dimeff, Baer, Kivlahan, & Marlatt, 1999). This personalized information is delivered in a manner that is consistent with motivational interviewing (Miller & Rollnick, 2002), which is a collaborative approach to counseling designed to elicit and strengthen motivation to change (Miller & Rollnick, 2009). Delivered typically in 1-3

sessions in a style that promotes client autonomy and self-efficacy, BMIs aim to uncover

discrepancies between the client's alcohol consumption and her or his personal values.

Harm reduction skills training are incorporated into BMIs to provide clients with the

skills necessary to change their current patterns of alcohol use (Dimeff et al., 1999).

BMIs have demonstrated efficacy in reducing alcohol use and alcohol-related

negative consequences among college students (Carey et al., 2007; Cronce & Larimer,

2011; Larimer & Cronce, 2007). In a study of a two session BMI conducted with student

referrals from a University health clinic, Amaro et al. (2010) found that BMI participants

($N = 449$) reported a decrease in alcohol consumption and alcohol-related negative

consequences between assessments at baseline and six month follow up. Further, over

this time-period participants reported increased use of self-protective strategies (i.e.,

strategies that protect against alcohol-related negative consequences). Although these

findings support the use of BMIs with college students, the results of this study should be

interpreted with caution given that no control condition was used to compare the effects

of the intervention.

Baer, Kivlahan, Blume, McKnight, and Marlatt (2001) conducted a BMI study

that found significant reductions in alcohol-related negative consequences among a

sample of college drinkers over a four-year period in comparison to a control group that

received no intervention. Begun in the Fall Semester of 1990, Baer et al. delivered a one-

session in person BMI known as Brief Alcohol Screening and Intervention for College

Students (BASICS) to a cohort of 174 incoming students identified as high-risk drinkers

(reported heavy episodic drinking on at least one occasion in last month or at least three

alcohol-related negative consequences from drinking). A semester following this intervention, the research team mailed a copy of the personalized feedback report that participants completed and made phone calls to the highest-risk participants to express concern and offer an opportunity to meet again. Assessed annually over the course of four years, these researchers found that the intervention group had significantly lower rates of alcohol-related negative consequences. Despite observing a decrease in alcohol problems, reductions in quantity and frequency of alcohol use was marginal (Baer et al., 2001).

Subsequent experimental research on the efficacy of BMIs to address college drinking has revealed additional limitations to this intervention strategy. Schaus et al. (2009) found that a two session BMI delivered to a high-risk sample (i.e., at least one report of heavy episodic drinking within the past two weeks) of students ($N = 181$) resulted in reductions in alcohol use and negative consequences from baseline to six month follow up assessment compared to a high-risk control group ($N = 182$). The most robust differences between groups were observed at the 3-month follow up as the effect size gradually diminished until no differences were found at 12 months (Schaus et al., 2009). Concerns regarding the reduced effect sizes were also underscored in a meta-analytic review of individual-level interventions to reduce college drinking that was conducted by Carey et al. (2007). Examining 62 controlled studies, these authors concluded that few between-groups effects on consumption persisted beyond 6 months (Carey et al., 2007).

A second limitation identified by Carey et al. (2007) in their meta-analysis of BMI studies was that these interventions were less successful when they targeted heavy drinkers or high-risk groups (e.g., student-athletes). These authors suggested that BMIs were less successful with high-risk drinkers because these students had different reasons or motives for consumption (Carey et al., 2007). To address these specific norms, motives, and beliefs, Carey et al. recommended the development of tailored interventions to target these students. The concern that BMIs were less effective with high-risk drinkers was echoed in a recent study conducted by Cleveland, Lanza, Ray, Turrisi, and Mallett (2012). These authors found that a BMI intervention was less successful with students identified as heavy drinkers (i.e., engaged in heavy episodic drinking over past two weeks, reported weekday drinking) and recommended the use of a person-centered approach that tailors treatment interventions based on the client's individual characteristics, rather than a one size fits all approach.

BMIs have demonstrated promise in addressing the problem of collegiate drinking; however, this intervention approach possesses several limitations. The effectiveness of BMIs to reduce the frequency and quantity of alcohol use is unconvincing. Further, the observed effect of BMIs on alcohol use outcomes tends to be small to moderate and diminishes over time (Carey et al., 2007). In response to these findings, researchers have called for continued investigation of the factors that influence alcohol use intensity and alcohol-related negative consequences (Carey et al., 2007). By identifying the complex array of determinants that contribute to these behaviors,

researchers will be able to design tailored BMIs that target the cognitive, social, and motivational factors relevant to high-risk populations.

The relative success of BMIs to reduce alcohol-related consequences has prompted researchers to study the application of specific components of this intervention approach facilitated in different settings. In particular, increased attention has been paid to standalone personalized normative feedback interventions that require no in person contact with a counselor. In the next section, I will provide an overview of standalone personalized feedback interventions. Strengths and limitations of this approach will be discussed.

Standalone Personalized Normative Feedback Interventions

The delivery of personalized feedback is an essential component of BMIs. To broaden access to this approach, researchers have developed standalone personal feedback interventions delivered to college students via computer or mail without the assistance of a trained clinician. These standalone programs collect and utilize student self-reported data to compute a feedback profile or report that highlights issues related to the student's alcohol consumption. These programs also offer "normative" feedback by including the rates of drinking by typical students on campus in order to correct misperceptions that students may have about how their drinking compares to their peers. In some instances, normative feedback provided has been based on a specific reference group relevant to the user (Lewis & Neighbors, 2006). In addition to feedback generated from self-report measures, these interventions can include harm reduction strategies and information on the effects of alcohol consumption (Cronce & Larimer, 2011).

Research on personalized feedback interventions have produced mixed results. In a study using a web-based personalized normative feedback program referred to as the electronic CHECK UP TO GO (e-CHUG), Doumas and Andersen (2009) found that first-year students in the intervention group ($N = 42$) reported greater reductions in weekly drinking quantity, frequency of drinking to intoxication, and occurrence of alcohol-related problems compared to the control condition (assessment only) at the three month follow up. Further analysis determined that only high-risk drinkers (defined as having engaged in heavy-episodic drinking at least once within the past two weeks) benefited from this intervention. In an earlier study utilizing the e-CHUG with high-risk first-year students, Walters, Vader, and Harris (2007) found similar findings; however, these authors observed no differences in alcohol use or alcohol-related negative consequences between the intervention and assessment only conditions at the 16 week follow up.

Because of the immediate, yet short-term efficacy, of personalized feedback approaches, researchers have attempted to utilize this strategy to address event-specific drinking. Neighbors, Lee, Lewis, Fossos, and Walter (2009) found that students ($N = 150$) who completed a web-based personalized normative feedback program reported lower estimated blood alcohol concentrations on their twenty-first birthday in comparison to students in the control condition ($N = 145$). This feedback program was tailored to students turning twenty-one and included information on the acute effects of heavy alcohol consumption as well as normative feedback on twenty-first birthday drinking reported by typical students at their institution. The authors revealed that this program

was primarily effective among participants who intended to reach higher levels of intoxication (Neighbors et al., 2009).

Examining the research literature on personalized normative feedback interventions, questions arise regarding the efficacy of this intervention. Although personalized feedback has reduced drinking and alcohol-related negative consequences in some high-risk samples (Doumas & Andersen, 2009), other studies have found this approach more beneficial for low-risk users (Larimer et al., 2007). In a review of studies that utilized this approach, Walters and Neighbors (2005) noted that it was unclear which specific populations benefited from personalized normative feedback. In their meta-analytic review of personalized feedback interventions, Riper et al. (2009) repeated these concerns and highlighted the small and short–term effect sizes (pooled standard effect size was $d = 0.22$) produced by this intervention.

Research conducted by Neighbors, Larimer, and Lewis (2004) shed light upon potential factors that moderate intervention effectiveness. In this study, these authors found that a computer-delivered personalized normative feedback intervention was more effective in reducing alcohol use and alcohol-related negative consequences among students who reported drinking for social reasons (Neighbors et al., 2004). These drinkers may have been more influenced by peer drinking feedback because they consumed alcohol for social reinforcement. Further, in a review of normative feedback programs, Lewis and Neighbors (2006) argued that these interventions might be more effective if targeted to drinkers who consumed alcohol for social reasons, as opposed to other drinking motives, such as coping.

Although standalone personalized normative feedback interventions have demonstrated success in reducing alcohol use and alcohol-related consequences among college populations, the magnitude and durability of these outcomes remains questionable. Further, a significant limitation of this approach is the limited knowledge of what types of collegiate drinkers benefit the most from normative feedback interventions. Understanding standalone personalized feedback and associate research is important because this approach is cost effective (DeJong, Larimer, Wood, & Hartman, 2009) and can have an impact on a large proportion of college students because it is web-based. Alcohol expectancy challenge interventions are another approach to prevention and treatment that may be enhanced by consideration of student-drinking motives. In the following part, I will describe research regarding this intervention strategy. Strengths and limitations of this approach will be examined.

Alcohol Outcome Expectancy Challenge Interventions

Challenging alcohol outcome expectancies is an intervention approach that has produced mixed outcomes in reducing alcohol consumption and alcohol-related negative consequences (Cronce & Larimer, 2011; Labbe & Maisto, 2011; Larimer & Cronce, 2007; Scott-Sheldon, Terry, Carey, Garey, & Carey, 2012). Challenging beliefs related to the effects of alcohol can occur as an intervention technique in counseling (e.g., via didactic presentation or guided discussion) or as a group intervention conducted within an in vivo setting (Jones et al., 2001). Conducted in a controlled environment, participants are given either an alcohol or placebo beverage, but are not told which beverage they receive. Once the beverages have been consumed in a setting designed to simulate the

atmosphere of a bar, participants indicate whether they and other participants consumed beverages that contained alcohol. Afterwards, participants receive feedback regarding who actually consumed alcohol and learn about how expectancies can influence behavior. It is expected that diminished positive alcohol outcome expectancies will result in a decreased desire to consume alcohol and lower rates of drinking (Jones et al., 2001).

Past research indicates that expectancy challenge interventions are more effective when they are experiential, rather than by lecture, video, or discussion (Labbe & Maisto, 2011). Wood, Capone, LaForge, Erickson, and Brand (2007) observed significant decreases in quantity and frequency of alcohol use among a sample of college students (ages 20-24) following a two-session in vivo expectancy challenge. These authors did not find reductions in alcohol-related negative consequences and reported that the significant intervention effects (e.g., reduced quantity and frequency) diminished completely by the 6-month follow up (Wood et al., 2007). Lau-Barraco and Dunn (2008) also found that exposure to an in vivo expectancy challenge intervention led to significant decreases in alcohol expectancies and alcohol consumption. However, these authors did not conduct follow up assessments beyond 30 days so the long-term impact of this intervention is unclear. Conversely, Corbin, McNair, and Carter (2001) examined the impact of a small-group facilitated expectancy challenge and found a significant reduction in alcohol outcome expectations but not in alcohol consumption. These authors noted that there was a trend (although not significant) toward better outcomes for male participants exposed to the expectancy challenge.

Alcohol expectancy challenge interventions appear to be more successful in reducing alcohol-use behaviors among male participants (Jones et al., 2001). In a narrative review of alcohol expectancy challenge studies, Labbe and Maisto (2011) found that expectancy challenges were most effective when administered to male-only groups of heavy drinkers in a simulated bar room environment. Expectancy challenges with female only and mixed gender groups produced less consistent results (Labbe & Maisto, 2011). Researchers (Corbin et al., 2001; Labbe & Maitso, 2011) have speculated that traditional expectancy challenge interventions have demonstrated less efficacy among women because these programs focused on challenging beliefs that are more salient among male college students. Administering the challenge in a "bar lab" setting may result in greater changes in alcohol use only among male participants, because the conditions created within this simulated environment do not activate the beliefs that promote and support drinking among women. Corbin et al. further suggested that if these interventions were designed to reflect drinking motives associated with female alcohol use intensity, such as drinking to cope with low self-esteem, they might become more effective with this population.

In a recent meta-analysis of expectancy challenge interventions with collegiate populations, Scott-Sheldon et al. (2012) found that these interventions failed to reduce alcohol-related negative consequences in comparison to control conditions. Further, these authors found that treatment effects related to reductions in alcohol consumption were not maintained at follow-up greater than four weeks. These findings, combined with previous reviews (Jones et al., 2001; Labbe & Maisto, 2011) suggest that greater attention is

needed within the literature to determine how alcohol outcome expectancies influence alcohol use and alcohol-related negative consequences. Jones et al. speculated that motivation is a critical element in understanding the relationship between alcohol outcome expectancies on alcohol use behaviors. Examining the moderating role of specific drinking motives may help elucidate the relationship among outcome expectancies, alcohol consumption, and alcohol-related negative consequences. A more nuanced view of how motivation influences alcohol beliefs and drinking behavior may result in findings that enhance the efficacy of alcohol outcome expectancy challenges.

Information to debunk myths associated with alcohol outcome expectancies also have been delivered as part of multicomponent education-focused interventions. These programs incorporate elements associated with other intervention strategies, such as personalized normative feedback and cognitive-behavioral skills training. Utilized as a primary (i.e., intervention that targets all students) and secondary (i.e., intervention targeting students identified as high-risk drinkers) prevention method, this approach can be delivered via computer or in person with a peer facilitator or trained clinician. It is critical for professional counselors working with collegiate populations to be well versed in these strategies given the wide exposure and potential impact that these interventions have on undergraduates. In the following section, I will describe research on multicomponent education-focused interventions. Strengths and limitations of this approach will be examined.

Multicomponent Education-Focused Interventions

Educational interventions that combine elements of brief motivational interventions, personalized normative feedback, and alcohol expectancy challenges, have been found to reduce alcohol consumption and alcohol-related negative consequences among college students. Nonetheless, these interventions possess limitations. In their review of individual-level interventions to address collegiate drinking, Cronce and Larimer (2011) remarked that the evidence was less strong in support of this approach than in their first review of the literature (Larimer & Cronce, 2002). In particular, the research supporting the efficacy of multicomponent educational group interventions to reduce alcohol consumption and alcohol-related negative consequences has been mixed (Cronce & Larimer, 2011). For instance, in a study conducted by Cimini et al. (2009), no treatment effects were observed among a sample ($N = 695$) of mandated college students (i.e., required to participate due to a violation of the alcohol policy) following the completion of a multicomponent group intervention. Although support for multicomponent interventions appears to have eroded, the use of web-based education programs with first-year students has received increased attention within the literature (NIAAA, 2007). A critical analysis of the research is necessary in order to evaluate the efficacy of this approach.

Web-based multicomponent educational interventions have emerged as an effective short-term population-level prevention strategy. Research conducted by Hustad, Barnett, Borsari, and Jackson (2010) found that first-year college students ($N = 82$) who completed a web-based multicomponent alcohol education program prior to moving to

campus reported lower levels of alcohol use and alcohol-related negative consequences at the one month follow up compared to an assessment only condition. Using a multi-campus national sample of first-year students, Paschall, Antin, Ringwalt, and Saltz (2011) also observed lower rates of alcohol-related negative consequences at the one-month follow up among the students who completed this course compared to students in the control group. These authors also found that this treatment effect did not persist into the spring semester (Paschall et al., 2011).

In addition to concerns regarding the durability of treatment effects, web-based multicomponent educational programs that target collegiate drinking also have been criticized for producing small effect sizes (Carey, Scott-Sheldon, Elliott, Bolles, & Carey, 2009). In their meta-analytic review of computer-based collegiate drinking interventions, Carey et al. commented that in order to increase the size and durability of these treatment effects, researchers should examine how to match students with intervention modalities. Targeting specific intervention components based on the characteristics of the particular student may be more effective than the current one-size-fits-all approach. A tailored approach may benefit multicomponent group intervention strategies; the unsuccessful intervention program examined by Cimini et al. (2009) was generic in that it did not target specific types of drinkers. By testing an integrative model that includes multiple determinants of collegiate drinking, the proposed current study may inform the enhancement of current multicomponent intervention programs.

In the previous section, four types of collegiate drinking prevention and treatment strategies were described. These intervention approaches have demonstrated some

success in reducing rates of alcohol use intensity and alcohol-related negative consequences but possess common limitations. A review of this literature was necessary in order to identify avenues of research relating to collegiate drinking that can have a meaningful impact in addressing this issue on college campuses. To enhance prevention and treatment, research is needed that seeks to discover how interventions can be tailored to address motivational, cognitive, and peer influences unique to specific populations on campus. By designing interventions tailored to college drinkers that target these specific variables, the treatment effect produced by these strategies may improve in both magnitude and durability. Further, by tailoring approaches to address the determinants that are relevant to the particular individual or type of drinker, these interventions will become more efficient in terms of cost and time, responding to a mounting call within the collegiate drinking literature for the development of strategies that are short-term and cost-efficient (DeJong et al., 2009).

In the next section, three major theories of collegiate drinking will be examined. Each of these theories, alcohol outcome expectancy theory, social norms theory, and the motivational model of alcohol use, has been cited within the literature as possible moderators of intervention efficacy, thereby making the proposed study particularly relevant in terms of prevention and treatment enhancement (Carey et al., 2007; Jones et al., 2001; Walters & Neighbors, 2005). Strengths and limitations of each theory will be discussed. As these findings are presented, a case will be made to integrate all three theories into a single, coherent, explanatory model of college student drinking and alcohol-related negative consequences.

Social Norms Theory

Perceived norms, or the perception of what constitutes typical or acceptable behavior among other peers, has been found to be a robust predictor of alcohol use intensity and alcohol-related-negative consequences (Borsari & Carey, 2001). First studied in collegiate populations by Perkins and Berkowitz (1986), Social Norms Theory refers to the role that indirect peer influence has on drinking behaviors. According to this theory, when college students overestimate the levels of permissiveness and consumption by their peers, they regulate their own alcohol use so that it adheres to the misperceived norms. Researchers have identified two distinct kinds of perceived norms, descriptive norms and injunctive norms (Borsari & Carey, 2003). Whereas descriptive norms refer to perceptions regarding prevalence of the behavior (i.e., behavioral norms), injunctive norms concern the perceived permissiveness of the behavior (i.e., attitudinal norms). Past research has indicated that descriptive and injunctive norms play unique roles in accounting for individual differences in alcohol use intensity and alcohol-related negative consequences among college students (Cho, 2006; Lee, Geisner, Lewis, Neighbors, & Larimer, 2007). In the preceding section, social norms theory will be described in more detail and research on each normative category will be presented and evaluated. Strengths and limitations of social norms theory will be discussed.

Several hypotheses have emerged within the research literature to explain how social norms influences drinking behavior. Pluralistic ignorance refers to when a majority of individuals assume that most of their peers behave or think differently from them when in actuality their attitudes and behavior are similar (Berkowitz, 2004; Borsari & Carey,

2003). This type of misperception encourages students to suppress healthy attitudes and behaviors related to alcohol consumption that are falsely thought to be non-conforming. In addition, this misperception promotes engagement in higher risk drinking behaviors that are seen incorrectly as normative. Support for the role that this misperception plays in explaining social norms was found by Suls and Green (2003). In this study, college students reported lower rates of drinking and more concern about excessive alcohol consumption compared to what they reported for their peers. Further, these students were believed to experience greater social pressure, more embarrassment, and increased difficulties fitting in, if they expressed concerns about drinking to friends (Suls & Green, 2003).

Whereas pluralistic ignorance may drive abstinent drinkers to initiate use or moderate drinkers to increase use in order to conform to perceived norms, false consensus refers to the incorrect belief that others are like oneself when in reality they are not, which may reinforce drinking behaviors of high-risk drinkers (Berkowitz, 2004; Borsari & Carey, 2003). Heavy drinkers may incorrectly believe that most students consume alcohol at similar rates in order to maintain their denial that their behavior is problematic. In a study of undergraduates at three liberal arts colleges, Pollard, Freeman, Ziegler, Hersman, and Goss (2000), found support for false consensus misperceptions. These authors found that the heaviest drinkers predicted that average campus use was equal to their own when in reality these rates were higher than self-reported use. Conversely, infrequent drinkers and nonusers considerably overestimated rates of student alcohol consumption (Pollard et al., 2000).

In order to shed light on the complex role that perceived norms play in influencing alcohol-use intensity and alcohol-related negative consequences among college students, an examination of normative reference groups in necessary. In their meta-analytic review of social norms research, Borsari and Carey (2003) found that students generally are impacted most by normative groups with whom they share similarities; therefore, the influence of social norms tends to increase as a function of how proximal a reference group of peers is to the student. As such, norms related to the "typical college student" tend to have less of an impact on drinking than norms of one's "closest friend." However, the influence of specific normative groups differs based on whether the perceived norm represents alcohol-related behavior (i.e., descriptive norms) or attitude (i.e., injunctive norms). Gender-specific descriptive norms, for example, appear to be significant and positive predictors of alcohol use intensity (Berkowitz, 2004; Neighbors et al., 2008).

Descriptive Social Norms

Descriptive drinking norms represent the perceived prevalence of alcohol us behaviors. Proximal normative reference groups have been found to be a more robust predictor of alcohol use intensity than distal reference groups (Cho, 2006). Examining a sample of undergraduates ($N = 235$), Lewis and Clemens (2008) found gender-specific normative beliefs of the prevalence of alcohol among the student's closest friends accounted for significant variance in alcohol use intensity. Further, these authors determined that same gender closest friend norms accounted for more variance than opposite gender closest friend norms in reported alcohol use intensity. Same gender

norms may be more salient to college student drinkers because of the physiological differences, related to alcohol metabolism and susceptibility to risk, among men and women. The differential influence of descriptive norms based on gender group was supported by Lewis and Neighbors (2004) and Larimer et al. (2009), who each found that perceived same-sex typical student norms were more strongly associated with problematic drinking than were gender-nonspecific typical student norms among collegiate samples. Lewis and Neighbors also found that perceived same-sex drinking norms were stronger predictors of alcohol consumption for women than for men, suggesting possible differences in how social norms influences drinking behavior among male and female college students. Further examination of the social norms literature reveals mixed evidence in support of this finding.

Whereas research conducted by Lewis and Neighbors (2004) found that perceived same-sex descriptive norms were stronger predictors of alcohol use for women than for men, other research found within the literature reported contrary findings. In a study of first-year students ($N = 311$), Read, Wood, Davidoff, McLacken, and Campbell (2002) found that association between perceived same-sex descriptive norms and alcohol use were significant for men, but not for women. Research conducted by Neighbors et al. (2008), also found that same-sex descriptive norms were more influential among male students. In their meta-analytic review of social norms research, Borsari and Carey (2003) commented on discrepancies found within the literature regarding the moderating effect of gender on social norms and noted that further investigation of these differences was warranted.

In addition to questions about gender differences and descriptive norms, some doubts exist regarding the association between descriptive norms and alcohol-related negative consequences. Although research has indicated that descriptive norms are directly related to drinking consequences (Korcuska & Thombs, 2003; Perkins & Wechsler, 1996), other studies have suggested that these norms possess less relevance in explaining alcohol-related negative consequences. Benton et al. (2006) examined descriptive norms and alcohol use among a sample of college students attending four Midwestern universities ($N = 7,565$) and found that normative perceptions did not explain any additional variance in alcohol-related negative consequences beyond that attributed to gender and alcohol consumption. A study of undergraduates by Wood, Read, Palfai, and Stevenson (2001) produced similar findings. Neighbors et al. (2007) examined the relationship between these variables and found evidence to support the mediational role of alcohol consumption in explaining the relationship between same-sex typical student descriptive norms and alcohol-related negative consequences. Identifying an indirect relationship between descriptive norms and alcohol-related negative consequences through alcohol consumption may help explain the findings by Benton et al. and Wood et al.; however, more research is needed to clarify the relationship that exists between these variables.

Descriptive social norms have been found to play an important role in understanding collegiate drinking. In particular, same-sex typical student descriptive norms appear to account for significant variance in alcohol use. Despite the considerable evidence in support of descriptive norms, questions remain concerning the role of gender

as a moderator of normative influence on drinking behaviors. For instance, conflicting findings on whether descriptive norms are a better predictor of drinking among men or women appear throughout research literature (Lewis & Neighbors, 2004; Read et al., 2002). Additionally, the relationship between descriptive norms and alcohol-related negative consequences warrants further study. Researchers have stressed the importance of studying both descriptive norms and injunctive norms in order to have a more comprehensive picture of the role that indirect peer influence plays in collegiate drinking behavior (Borsari & Carey, 2001). Indeed, when examined simultaneously with descriptive norms, injunctive norms act as a unique and significant predictor of alcohol consumption (Berkowitz, 2004; Borsari & Carey, 2003).

Injunctive Social Norms

Injunctive, or attitudinal, social norms refer to the perceived permissiveness of alcohol use behaviors. Found to be distinct and not interchangeable with descriptive norms (Lee et al., 2007), injunctive norms have been associated with both alcohol use intensity and alcohol-related negative consequences in collegiate populations (Berkowitz, 2004). Examining data from the 2001 Harvard School of Public Health College Alcohol Study (CAS), a national study of full-time undergraduates ($N = 10,008$), Ward and Gryczynski (2009) reported that greater perceived peer acceptance of alcohol risk behaviors (e.g., playing drinking games, having one or two drinks before drinking) resulted in higher rates of heavy episodic drinking, even after controlling for individual characteristics (i.e., gender). In an earlier study utilizing data from the 1993 CAS ($N = 17$,

592), Perkins and Wechsler (1996) found that more permissive perceptions of drinking were significantly associated with alcohol-related negative consequences.

Similar to descriptive norms, the relationship between injunctive norms and alcohol-related negative consequences remains vague. Although Neighbors et al. (2007) found that alcohol consumption mediated the association between perceived acceptance of drinking by friends and alcohol-related negative consequences, other researchers have found direct relationships between injunctive norms and alcohol problems (Perkins & Wechsler, 1996). Further, some evidence suggests that injunctive drinking norms are related to strategies that prevent or reduce the occurrence of alcohol-related negative consequences. Ray, Turrisi, Abar, and Peters (2009) found a significant relationship between perceived friend acceptance of protective drinking strategies and reported use of these strategies by students. Further, the use of protective drinking strategies was negatively associated with alcohol-related negative consequences over and above alcohol consumption. The proximity of the normative reference group appears to moderate the impact that injunctive drinking norms have on alcohol-related negative consequences as well as alcohol use in general (Borsari & Carey, 2003).

Examining the moderating role of normative reference groups provides added clarity to the relationship among injunctive norms and collegiate drinking practices. In study examining the influence of several normative reference groups at increasing levels of similarity to the undergraduate participants (e.g., typical same-sex student, close friend), LaBrie, Hummer, Neighbors, and Larimer (2010) found that perceived approval of close friends was a stronger predictor of alcohol-related negative consequences

compared to more distal groups, including members of the same Greek organization, race, or gender. These findings, that groups that are more proximal (i.e., closest friends) are more influential determinants of drinking behavior, are consistent with descriptive norms research (Lewis & Neighbors, 2004). It seems apparent that the opinions of a student's close friends are more salient compared to that of a typical student enrolled at the student's school.

Research conducted by Neighbors et al. (2008) with a sample of first-year undergraduates ($N = 811$) also lends support to the argument that greater proximity is related to increased normative influence on drinking behavior. In addition to finding that only perceptions of proximal reference groups (e.g., friends) were positively associated with drinking behavior, these authors also found that more distal groups, such as same-sex typical students, were negatively associated with personal drinking. Interestingly, in the same regression analysis, these authors founds that descriptive norms of same-sex typical students remained a significant positive predictor of alcohol consumption (Neighbors et al., 2008). Commenting on these puzzling findings, these authors speculated that once influences of important others are controlled, the remaining variance attributed to approval of less important typical students becomes inconsequential. Further, these authors suggested that descriptive norms of same sex typical students were significant positive predictors of drinking because these norms represented behaviors, which are more observable in broader populations (e.g., among all same sex students); whereas attitudes and values, represented by injunctive norms, are more likely to be observed among more proximal groups (e.g., close friends; Neighbors et al., 2008). Given

these findings, it is apparent that the moderating role of the normative reference group may differ among injunctive and descriptive norms.

Based on the research presented in this section, it is clear that in order to investigate the role of peer influence in explaining collegiate alcohol use, that both injunctive and descriptive norms must be examined. Both same-sex typical student descriptive norms and close friend injunctive norms have served as consistent and robust predictors of collegiate drinking when studied independently (LaBrie et al., 2010; Lewis & Neighbors, 2004) or simultaneously (Neighbors et al., 2007, 2008) in samples of college students. Concurrent examination of both variables will enable researchers to identify which of the two types of norms is a better predictor of alcohol use and alcohol-related negative consequences. Currently, contradictory findings exist within the literature regarding whether descriptive or injunctive norms serve a role in accounting for alcohol-related negative consequences (Cho, 2006; Larimer, Turner, Mallett, & Geisner, 2004).

In addition to studying the relative weight of each type of norm on collegiate drinking behavior, examining the influence of these norms among subpopulations of college students would further clarify this theory. Whereas research on the moderating role of gender on descriptive norms varies (Lewis & Neighbors, 2004; Read et al., 2002), the research on the role of gender on injunctive norms is limited. Improving the explanatory power of social norms also can be accomplished by examining the moderating role of student class year. Although, at present, no research on class year and injunctive norms exists, research conducted by Pedersen, Neighbors, and LaBrie (2010)

found that first-year students were more impacted by perceived descriptive norms than students in other class years. Considering the developmental tasks faced by first-year students, such as identity formation and relationship building (Schulenberg & Maggs, 2002), both injunctive and descriptive norms may have a more substantial impact on theses student's drinking behaviors in comparison to upperclassmen (i.e. sophomores, juniors, seniors).

Finally, further research is needed to explicate the relationships between descriptive norms, injunctive norms, and alcohol-related negative consequences. More specifically, it is unclear whether these variables have a direct or indirect (via alcohol use) link to negative consequences. Considering other mediating variables, such as drinking motives, may help clarify the relationship between normative variables and alcohol-related negative consequences. Lee et al. (2007), investigated norms and social motives in a sample of first-year students ($N = 1,400$) and found that the association between perceived norms (injunctive and descriptive) and personal alcohol consumption was stronger among students who reported stronger social reinforcement motives for drinking. These findings indicate that social reinforcement drinking motives helps to explain the relationship between these variables, and suggests that other types of drinking motives may improve the explanatory power of social norms to predict alcohol-related negative consequences. In particular, conformity motives, a variable associated with problematic alcohol consumption (Merrill & Read, 2010), may serve as a pathway for social norms to influence alcohol-related negative consequences. Drinking motives,

including social reinforcement and conformity motives, are discussed in the following section.

Motivational Model of Alcohol Use

The motivational model of alcohol use (Cox & Klinger, 1988, 2011) is an explanatory framework consisting of four discrete categories of drinking motives that influence alcohol use. These drinking motives, coping, conformity, social reinforcement, and enhancement, are associated with different patterns of alcohol consumption among collegiate populations. Social reinforcement and enhancement are associated with alcohol consumption, whereas coping and conformity are linked to alcohol-related negative consequences (Kuntsche et al., 2010; Merrill & Read, 2010). Drinking motives have been identified within the research literature as key determinants of collegiate drinking and alcohol-related negative consequences (Baer, 2002; Ham & Hope, 2003; Neighbors et al., 2007). Indeed, specific drinking motives have been found to partially mediate the relationship among social norms variables and drinking intensity (Read et al., 2003). In the following section, the motivational model of alcohol use will be reviewed and research on the associations among specific drinking motives, alcohol use intensity, and alcohol-related negative consequences will be described.

Developed by Cox and Klinger (1988) to account for the various cognitive and social factors that influence alcohol use, the motivational model of alcohol use describes how drinking is linked to affect regulation. According to the model, cognitive (i.e., alcohol outcome expectancies) and social (i.e., peer influence) determinants of alcohol use are channeled through specific motivational pathways that influence the drinker's

expectations of affective change from alcohol consumption (Cox & Klinger, 2011). Based on the perceived benefits of the expected affective change, a person may (or may not) decide to engage in the goal-oriented (i.e., drinking to achieve specific goals) behavior of alcohol consumption. The contribution of each cognitive and social factor in this decision process varies from one person to another. For example, a college student who feels intense social pressure to drink alcohol in order to "fit in" may decide that the benefits to consume alcohol, to avoid negative affective changes associated with social rejection, outweigh the advantages of not drinking.

According to this model, there are two ways that drinkers can expect alcohol use to change their affect, by the direct pharmacological effects or the indirect instrumental effects of consumption (Cox & Klinger, 1988, 2011). Alcohol consumption can change affect in positive ways through its effect on suppressing inhibitory neurotransmitters in the brain or be used to alleviate negative affect, such as depression or anxiety, by its effect on suppressing excitatory neurotransmitters (Valenzuela, 1997). In addition to these chemical effects of alcohol, drinking also can produce change in affect indirectly. For example, alcohol consumption can result in positive social rewards. Drinking to avoid social rejection is another indirect way that alcohol can ease negative affect.

When each source (internal or external) and valence (positive or negative) of expected affective changes is considered together, four distinct categories of drinking motives emerge. These motives are (a) externally generated, positive reinforcement motives; (b) externally generated, negative reinforcement motives; (c) internally generated, negative reinforcement motives; and (d) internally generated, positive

reinforcement motives. Cooper (1994) operationalized these motives as social

reinforcement, conformity, coping, and enhancement motives and developed the

Drinking Motives Measure-Revised (DMM-R) to assess each motive described in the

motivational model of alcohol use. Cooper initially tested the relative impact of each

motive in predicting alcohol use and alcohol-related negative consequences with a

sample of adolescents ($N = 1,243$) and found that positive drinking motives

(enhancement and social reinforcement) were better predictors of alcohol consumption,

whereas negative motives (coping and conformity) were more relevant in explaining

alcohol-related negative consequences. Cooper (1994) has argued that coping and

conformity are better predictors of alcohol-related negative consequences because these

motives are associated with regulation of negative affective states. Since this initial study,

these findings have been validated in collegiate samples (Martens, Rocha, et al., 2008;

Merrill & Read, 2010). Research examining the associations among each of the four

drinking motives, alcohol use, and alcohol-related negative consequences in collegiate

populations is presented below.

Social Reinforcement Drinking Motives

Social drinking motives, representing positive and extrinsic reasons to consume

alcohol, have been associated with alcohol consumption among college students.

Martens, Rocha, et al. (2008) examined drinking motives with a sample of

undergraduates ($N = 441$) and identified social reinforcement motives as one of the

strongest correlates of heavy episodic drinking and number of days in the past 30 that

alcohol was consumed. These findings suggest that drinking for social purposes is

related to both quantity and frequency of alcohol use. In a separate study, Martens, Ferrier, and Cimini (2007) found that social motives predicted reported total drinks per week in a sample of college students ($N = 254$). These authors also found that this relationship was mediated by the use of protective behavioral strategies (i.e., cognitive-behavioral strategies that reduce high-risk drinking). More specifically, students who were motivated to consume for social purposes engaged in fewer protective strategies, which was associated with higher amounts of alcohol consumed (Martens et al., 2007). This mediational relationship also was observed by LaBrie, Kenney, Mirza, and Lac (2011) within a large sample ($N = 1,592$) of undergraduate heavy drinkers (i.e., reported at least one episode of heavy episodic drinking during the past month).

Although most research on drinking motives and college students (Martens et al., 2007; Martens, Rocha, et al., 2008) has found a significant relationship between social reinforcement motives and alcohol use, a recent collegiate drinking study conducted by Merrill and Read (2010) did not find a statistically significant relationship between these variables. Utilizing path analysis, these authors examined the relationships between all four motives, a composite alcohol use variable (composed of alcohol use quantity, frequency, heavy episodic drinking frequency, and daily estimated blood alcohol concentration), and alcohol-related negative consequences and did not find that social motives were associated with either drinking or negative consequences. The failure to observe this hypothesized connection was potentially the result of the sample size; Merrill and Read reported that due to the relatively small sample size ($N = 192$) their study possessed inadequate power to detect smaller effect sizes.

The association among social reinforcement motives and alcohol-related negative consequences appears to be mediated by alcohol consumption. In a study examining several predictors of collegiate drinking, Read et al. (2003) found that a composite alcohol use variable (composed of quantity and frequency of alcohol use per week during the past three months) mediated the relationship between social motives and alcohol-related negative consequences. Increased social motives were related to higher rates of alcohol use, which was associated with higher rates of alcohol-related negative consequences (Read et al., 2003). These authors also found that social motives partially mediated the positive relationship between perceived peer drinking environment (composite variable combining injunctive and descriptive social norms) and alcohol use (Read et al., 2003). Whereas social reinforcement motives possess a strong association with alcohol consumption, the other external drinking motive, conformity, has a stronger relationship with alcohol-related negative consequences (Cooper, 1994; Merrill & Read, 2010).

Conformity Drinking Motives

Drinking to avoid social rejection has been associated with alcohol-related negative consequences in both adolescent (Cooper, 1994) and collegiate samples (Merrill & Read, 2010). In their study of the relationship among drinking motives and discrete domains of alcohol-related consequences, Merrill and Read found that conformity motives were positively associated with alcohol-induced poor self-care, diminished self-perception, and impaired control. Martens, Rocha, et al. (2008) found that compared to the four other drinking motives, conformity had the strongest relationship with alcohol-

related negative consequences. These authors also found a statistically significant difference in conformity motives among first-year students and seniors ($d = .39$), with first year students reporting higher levels of conformity motives (Martens, Rocha, et al., 2008). This was the only drinking motive that differed significantly by class standing. Higher conformity motives among first-year students seem plausible given the acute challenges that students face to form new relationships and affiliations during the transition from high school to college (Schulenberg & Maggs, 2002). These findings suggest that conformity motives may play a pivotal role in explaining the higher rates of high-risk drinking among first-year students (Borsari et al., 2007) above and beyond that of other drinking motives. Because this line of inquiry was not specifically addressed by Martens, Rocha, et al. (2008), further study is necessary.

Although conformity motives have shown promise in explaining rates of alcohol-related negative consequences among college populations, more research is needed to clarify this relationship. Many previous studies of drinking motives and collegiate drinking have not examined conformity motives (Kuntsche, Knibbe, Gmel, & Engels, 2006). Excluding conformity motives was likely because many researchers mistakenly believed that conformity motives were more important in explaining drinking behaviors among younger adolescents than college students (Kuntsche et al., 2006). Research conducted by Merrill and Read (2010) as well as by Martens, Rocha, et al. (2008) have established the relevancy of conformity motives in accounting for rates of alcohol-related negative consequences among college students. Replication of these findings in larger samples and further analysis of the role that these specific motives play based on

demographic variables, such as gender and class year, status is necessary. Indeed, Read et al. (2003) noted that excluding conformity motives from their study was a limitation and suggested that future studies would benefit from the inclusion of this drinking motive. The next drinking motive, coping, also has been found to be a significant predictor of alcohol related negative consequences.

Coping Drinking Motives

Motivation to drink in order that the chemical effects of alcohol alleviate negative emotional states, or coping drinking motives, has been found to be a robust predictor of alcohol-related negative consequences among college students (Martens et al., 2007). Specific domains of alcohol-related negative consequences associated with coping motives include academic/occupational problems, risky behaviors, and poor self-care (Merrill & Read, 2010). Although a strong relationship exists with alcohol-related negative consequences, the relationship between coping drinking motives and alcohol consumption is tentative. Studies conducted by Leigh and Neighbors (2009) as well as Martens et al. (2007) found significant direct relationships among coping motives and alcohol-related negative consequences; however, neither study revealed significant associations between coping motives and drinking. Kuntsche et al. (2010) found that coping motives predicted alcohol-related negative consequences as well as alcohol use quantity and frequency; however, these findings should be interpreted with some caution given that the study was conducted in Switzerland with a sample of younger adolescents (mean age = 15.2 years old). These findings suggest that coping drinking motives are related to a pattern of drinking behavior that is more associated with the consequences of

alcohol use, rather than by the quantity or frequency of use. Cooper (1994) argued that coping motives had a direct relationship with alcohol-related negative consequences because this style of drinking reflected a general tendency to cope with problems ineffectively, which could exacerbate drinking problems independently of level of alcohol consumption. Therefore, drinking to cope with negative affect can be associated with numerous alcohol-related negative consequences (i.e., problems with friends/family, feeling badly about self) regardless of alcohol use quantity and frequency.

Coping drinking motives have been found to help explain the relationship between anxiety and alcohol-related negative consequences among college students. Goldsmith, Tran, Smith, and Howe (2009) examined Generalized Anxiety Disorder (GAD; APA, 2000) and alcohol-related negative consequences among a sample of college students ($N = 782$). These authors found that coping motives partially mediated the relationship between generalized anxiety and alcohol-related negative consequences (Goldsmith et al., 2009). The relationship among these variables was positive in that increased GAD scores were related to greater coping motives, which was associated with higher levels of alcohol-related negative consequences. Coping motives also have contributed to models explaining social anxiety among college students. Ham, Zamboanga, Bacon, and Garcia (2009) found that coping motives partially mediated the relationship between social anxiety and alcohol-related negative consequences among a sample of college students ($N = 817$). Consistent with previous research (Leigh & Neighbors, 2009; Martens et al., 2007), these authors did not find a relationship between coping motives and alcohol use (Ham et al., 2009).

In addition to anxiety, coping motives have been associated with negative affect and college adjustment. In a study examining the role of negative affect, coping drinking motives, and alcohol related negative consequences, Martens, Neighbors, et al. (2008) found that coping motives and negative affect (i.e., extent to which participant felt distressed, scared, nervous, etc.) moderated the relationship between alcohol consumption and alcohol-related negative consequences. This three-way interaction indicated that the strongest relationship between alcohol use and alcohol-related negative consequences existed for students high in both negative affect and coping motives (Martens, Neighbors et al., 2008). These findings provide further evidence that coping motives are associated with alcohol-related negative consequences.

Extending research on the relationship between coping motives and alcohol-related negative consequences, LaBrie, Ehret, Hummer, and Prenovost (2012) found that poor adjustment to college life positively mediated the relationship between these variables within a sample of undergraduates ($N = 253$), such that increased drinking motives were related to poorer adjustment, which was associated with higher rates of alcohol-related negative consequences. In this study, poor college adjustment referred to academic and social issues, such as academic problems, thoughts of dropping out, and lack of motivation (LaBrie et al., 2012). Whereas drinking to cope is a robust predictor of alcohol-related negative consequences, a review of enhancement motives will demonstrate that this internally generated motive plays an important role in explaining alcohol use intensity and, to a lesser extent, alcohol related negative consequences.

Enhancement Drinking Motives

Motivation to drink in order that the chemical effects of alcohol enhance positive emotional states has been associated with both alcohol use intensity and alcohol-related negative consequences. More specifically, enhancement motives have been found to possess a direct relationship to alcohol consumption (Martens et al., 2007; Yurasek et al., 2012) and an indirect relationship, by way of alcohol consumption, with alcohol-related negative consequences (Merrill & Read, 2010). For example, Mezquita, Stewart, and Ruipérez (2010) found that enhancement motives accounted for a significant portion of variance in reported drinking per month (i.e., average drinks per occasion multiplied by frequency of alcohol use during the past 30 days) in a sample ($N = 521$) of undergraduates. Utilizing path analysis, Read et al. (2003) observed a direct positive relationship between enhancement motives and alcohol consumption (combination of quantity and frequency) as well as an indirect positive relationship between enhancement motives and alcohol-related negative consequences mediated by alcohol consumption. A closer analysis of the indirect association between enhancement drinking motives and alcohol-related negative consequences conducted by Merrill and Read (2010) revealed that drinking for enhancement purposes places students at risk for numerous social, physical, and social problems. Mediated by heavy alcohol consumption, enhancement motives were indirectly associated with social/interpersonal problems, impaired control, negative self-perception, dependence, academic/occupational problems, and risky behaviors (Merrill & Read, 2010). An unexpected direct relationship between enhancement motives and blackout drinking also was observed (Merrill & Read, 2010).

Unexpected direct paths between this drinking motive and alcohol related negative consequences also have been found in non-college samples (Cooper, 1994; Cooper, Agocha, & Sheldon, 2000), indicating that further research is warranted to explain the relationship between these variables.

In the previous section, the motivational model of alcohol use was described. Research was examined that described the relationships among social reinforcement motives, conformity motives, coping motives, enhancement motives, alcohol use intensity, and alcohol-related negative consequences. Based on this review of the drinking motives literature, several conclusions can be made. Each of the four drinking motives play a unique and important role in explaining collegiate drinking; however, more research is needed to determine how drinking motives influence alcohol use intensity and alcohol-related negative consequences among different populations on campus. For example, although Cooper (1994) reported that male respondents were more likely to endorse drinking for social, enhancement, and conformity motives, there is limited evidence that these differences exist among collegiate populations. Martens, Rocha, et al. (2008) did find that first-year students reported higher levels of conformity motives in comparison to seniors; however, the correlational nature of this study limits its utility in explaining collegiate drinking. Given the potential to design tailored brief motivational interventions based on differences observed among these groups, further research examining how drinking motives vary by gender and first-year is warranted. The current study is designed to address this gap.

An additional avenue of research is to examine the possible social and cognitive antecedent factors that are theorized to influence drinking behavior through drinking motives. Read et al. (2003) found that social reinforcement motives partially mediated the relationship among social norms variables and drinking intensity; however, these authors did not include conformity motives in their path model precluding a full test of the hypothesized pathways proposed by Cox and Klinger (1988, 2011). Additionally, further research is needed to explain the associations among drinking motives and beliefs about the anticipated effects of alcohol consumption, commonly called alcohol outcome expectancies. Researchers studying both constructs have found that drinking motives mediated the relationship between alcohol outcome expectancies and drinking outcomes (Kuntsche et al., 2010). Thus, examining one's expectations of alcohol's effects, in addition to drinking motives, may provide greater insight regarding the associations among these variables and alcohol use intensity and alcohol-related negative consequences. In the next section, alcohol outcome expectancies will be defined and discussed, along with associated outcome research, strengths, and limitations.

Alcohol Outcome Expectancies

Alcohol outcome expectancies refer to the beliefs that individuals hold about the chemical effects of consuming alcohol (Brown, Goldman, Inn, & Anderson, 1980). Whereas drinking motives relate to the specific reasons for use, alcohol outcome expectancies are the beliefs about the anticipated effects of alcohol that drive drinking-related motivation and behavior (Jones et al., 2001). Past research has demonstrated that expectancies are unique (Kuntsche et al., 2010) and that endorsement of an expected

outcome was necessary for the endorsement of that effect as a reason for drinking (Leigh, 1990), thus linking the relationship between outcome expectancies and drinking motives. Alcohol outcome expectancies have been among the most studied determinants of collegiate drinking (Baer, 2002; Ham & Hope, 2003) and have been linked to alcohol use intensity and alcohol-related negative consequences among college students (Ham, Stewart, Norton, & Hope, 2005; Neighbors et al., 2007; Valdivia & Stewart, 2005; Wood et al., 2001). Given this strong relationship, if combined with social norms and drinking motives to examine collegiate drinking, alcohol outcome expectancies may help to explain the associations among these variables. In the following section, alcohol outcome expectancy theory will be described. An analysis of research regarding specific categories of outcome expectancies will be conducted. The section will conclude with a discussion of strengths and limitations of this theory in explaining collegiate drinking.

Expectancy theory, a learning theory that was formulated by Tollman (1932) and developed by theorists including Rotter (1954) and Bandura (1986), has deep roots in the alcohol studies literature. Marlatt, Demming, and Reid (1973) utilized expectancy theory to test the assumption that alcohol dependent individuals suffered from a lack of self-control to the physiological effects of alcohol use. These authors found that outcome expectancies were a greater determinant, compared to physical response, of the amount consumed during a lab experiment in which participants were administered alcohol or a placebo (Marlatt et al., 1973). Early work to measure the anticipated consequences of alcohol consumption was conducted by Brown et al. (1980). These authors found that heavier drinkers reported higher levels of positive alcohol outcome expectancies (Brown

et al., 1980). Although the instrument developed by Brown et al. had demonstrated success in predicting heavy alcohol consumption, it was criticized for not including negative alcohol outcome expectancies (Leigh, 1989). Leigh argued that negative and positive expectancies were distinct constructs and that the inclusion of negative expectations would help discriminate among light and heavy drinkers. Subsequent research conducted by Leigh and Stacey (1993) supported the claim that positive and negative outcome expectations were unique constructs and found that both negative and positive outcome expectancies were significantly related to alcohol use.

Alcohol use intensity and alcohol-related negative consequences have been significantly associated with both positive and negative alcohol outcome expectancies among collegiate populations (Ham, Stewart, Norton, & Hope, 2005). When regressed onto drinking outcome variables simultaneously, both types of expectancies made unique and significant contributions in accounting for variance (Fromme et al., 1993). Controversy exists, however, regarding the role of negative alcohol outcome expectancies in predicting alcohol use and alcohol-related negative consequences. Although early research on this construct with undergraduates indicated that higher negative outcome expectancy scores were inversely related to alcohol use (Fromm et al., 1993), subsequent research has found that drinking outcomes were positively associated with both global scores of negative outcome expectancies (Neighbors et al., 2007) as well as second order negative outcome expectancy subscale scores (Valdivia & Stewart, 2005). These discrepancies may suggest that strong beliefs about the negative effects of alcohol consumption may encourage alcohol use among some collegiate drinkers. Whereas some

controversy has existed regarding the relationship between negative alcohol outcome expectancies and collegiate drinking, positive alcohol outcome expectancies have consistently been found to be positively associated with alcohol use intensity and alcohol-related negative consequences among college students.

Positive Alcohol Outcome Expectancies

Positive alcohol outcome expectancies refer to the anticipated positive chemical effects of alcohol consumption. According to expectancy theory, individuals who believe that the act of drinking alcohol will result in positive consequences are more likely to consume alcohol compared to those who do not hold such beliefs (Brown et al., 1980). Consequently, those with stronger positive beliefs about alcohol are at greater risk for heavy drinking and alcohol-related negative consequences. Research among college students supports this argument. In a four year longitudinal study of alcohol use outcomes (i.e., combined measure of quantity and frequency) in a sample of undergraduates ($N =$ 585), Sher et al. (1996) found that positive alcohol outcome expectancies had an etiologic and maintaining role in predicting consumption. Although relatively stable rates of alcohol use was found across the four years, a significant decrease in outcome expectancies was observed from participants' first year to fourth year in college (Sher et al., 1996). These findings may indicate that positive alcohol outcome expectancies may be more salient for students when they first begin to consume alcohol. This seems logical given that expectancies can be formed prior to first drink and have been associated with greater intentions to drink among non-using adolescents (Zamboanga, Ham, Van Tyne, & Pole, 2011).

Greater positive alcohol outcome expectancy scores also have been associated with elevated levels of alcohol-related negative consequences (Herschl, McChargue, MacKillop, Stoltenberg, & Highland, 2012). Thombs (1993) found that positive alcohol outcome expectancies discriminated between problem and non-problem drinking college students ($N = 1,148$), as defined by scores on the Short Michigan Alcoholism Screening Test (Selzer, Vinokur, & Rooijen, 1975). Thombs noted that the specific alcohol outcome expectancy that possessed the strongest discriminating value varied by gender; for men, "physical and social pleasure" possessed the strongest discriminating value and, for women, "arousal and power" was the strongest value. Subsequent research also has indicated differences among positive alcohol outcome expectancies by gender (Piane & Safer, 2008; Read, Wood, Lejuez, Palfai, & Slack, 2004).

College students with greater positive outcome expectancies may be more likely to experience alcohol-related negative consequences because these beliefs are associated with high-risk drinking behaviors. Zamboanga, Schwartz, Ham, Borsari, and Van Tyne (2010) found that positive alcohol outcome expectancies were positively related to drinking game participation and that pre-gaming (i.e., consuming alcohol before going to a party, club, or other social setting) mediated the relationship between positive alcohol outcome expectancies and alcohol-related negative consequences in a sample of undergraduates ($N = 1,327$). Thus, greater levels of positive alcohol outcome expectancies were associated with increased pre-gaming frequency, which increased risk for alcohol-related negative consequences (Zamboanga et al., 2010). In addition to positive alcohol outcome expectancies, negative alcohol outcome expectancies have been

shown to play an important role in predicting alcohol use intensity and alcohol-related

negative consequences (Ham et al., 2005). These expectancies will be considered next.

Negative Alcohol Outcome Expectancies

Negative alcohol outcome expectancies refer to the anticipated negative chemical

effects of alcohol consumption. According to expectancy theory, individuals who believe

that the act of drinking alcohol will result in negative consequences are less likely to

consume alcohol compared to those who do not hold such beliefs (Jones et al., 2001). To

test this theory, Fromme et al. (1993) developed the Comprehensive Effects of Alcohol

Questionnaire (CEOAQ) to assess both positive and negative alcohol outcome

expectancies. At this time, the CEOAQ remains the only instrument developed within

collegiate populations to measure both positive and negative alcohol outcome

expectancies. Evaluating the psychometric properties of the CEOAQ among a sample of

college students ($N = 344$), the authors found that negative alcohol outcome expectancies

were negatively associated with the quantity and frequency of alcohol consumption

(Fromme et al., 1993). However, subsequent research utilizing the CEOAQ has produced

dissimilar findings. Neighbors et al. (2007) examined alcohol outcome expectancies

simultaneously with other drinking variables and found that negative alcohol outcome

expectancies were positively associated with alcohol-related negative consequences.

Additional research using the CEOAQ also found negative alcohol outcome expectancies

to be positively related to alcohol-related negative consequences (Neighbors, Walker, &

Larimer, 2003) and hazardous drinking (Zamboanga et al., 2010). To understand the

complex relationship between negative alcohol outcome expectancies and collegiate drinking, a closer examination of this construct is necessary.

The CEOAQ contains four positive outcome expectancies (sociability, tension reduction, liquid courage, and sexuality) and three negative outcome expectancies (cognitive and behavioral impairment, risk and aggression and negative self-perception) subscales. Inspecting the contribution of each of the negative alcohol outcome expectancy subscales provides insight regarding the construct's inconsistent relationship with alcohol use intensity and alcohol-related negative consequences. Examining the validity of the CEOAQ in a larger sample of college students ($N = 1,004$), Valdivia and Stewart (2005) found that several negative alcohol outcome expectancy subscales were positive predictors of alcohol consumption. More specifically, risk and aggression as well as cognitive and behavioral impairment were significant positive predictors of drinking frequency and quantity, indicating that the more the individual held these beliefs, the more heavily he or she tended to drink (Valdivia & Stewart, 2005). Negative self-perception had a negative beta-weight for both quantity and frequency, signifying that the more an individual expected their self-perception to change following drinking, the less heavily he or she tended to drink (Valdivia & Stewart, 2005). Similar findings also were reported by Ham et al. (2005). These authors found that when controlling for the other expectancy factors (i.e., cognitive and behavioral impairment, sociability, tension reduction, liquid courage, and sexuality) the higher the expectancies of risk and aggression and lower the expectancies of negative self-perception, the greater the amount of weekly drinking among participants ($N = 581$).

In contrast to researchers who found that negative self-perceptions had a negative relationship with alcohol consumption (Valdivia & Stewart, 2005; Ham et al., 2005), Agrawal et al. (2008) found that negative self-perception had a positive relationship with drinking among a sample of young adults (mean age = 22 years old; *N* = 3,656). These authors initially found no relationships among these variables; however, when they removed life-abstainers from the analysis, they found that negative self-perception (along with other negative alcohol outcome expectancy subscales) became a positive predictor of alcohol use quantity and frequency (Agrawal et al., 2008). Although this study was conducted within a community sample (no demographics were provided reporting the percentage of participants enrolled in college), these findings may shed light upon a potential limitation of previous research (Ham et al., 2005; Valdivia & Stewart, 2005) that found a negative relationship among these variables; namely, that the previous studies included participants who were lifetime abstainers. It is possible that by including lifetime abstainers (as high as 19% of the sample in Ham et al., 2005) these studies were not able to detect a positive relationship between these variables among drinkers. Moreover, when Neighbors et al. (2007) found that negative alcohol outcome expectancies were a positive predictor of alcohol-related negative consequences, no abstainers were included in the sample. Examining negative alcohol outcome expectancies in a sample of active drinkers (e.g., alcohol consumption within the past year) is necessary in order to clarify the role that this construct plays in explaining collegiate drinking.

The beliefs represented within the CEOAQ negative alcohol outcome expectancies scale appear to support increased alcohol consumption. Indeed, the beliefs that have been labeled as "negative," appear to be positive alcohol outcome expectancies. There is convincing evidence that risk and aggression expectancies and cognitive and behavioral impairment expectancies are positively associated with alcohol consumption (Ham et al., 2005; Valdivia & Stewart, 2005) and tentative support for negative self-perception expectancies (Agrawal et al., 2008) as well. When used as a single global "negative" alcohol outcome expectancies unit, this scale has been found to predict alcohol use intensity and alcohol-related negative consequences among collegiate drinkers (Neighbors et al., 2007; Neighbors et al., 2003). Based on these findings, it is evident that negative alcohol outcome expectancies play a role in explaining collegiate drinking; however, more research is needed to learn more about this complex relationship.

In the previous section, alcohol outcome expectancies were defined and discussed. Research describing the associations among alcohol outcome expectancies, alcohol use intensity, and alcohol-related negative consequences in collegiate populations was examined. This review of the research literature clearly indicates that positive alcohol outcome expectancies play an important role in understanding collegiate drinking. Although "negative" alcohol outcome expectancies have produced somewhat incongruous findings, this construct has been found to account for significant variance in alcohol consumption above and beyond that of positive alcohol outcome expectancies (Valdivia & Stewart, 2005) signifying its importance in alcohol outcome expectancy

research. Further, when examined concomitantly with peer influence (i.e., injunctive and descriptive social norms), negative alcohol outcome expectancies remained a significant predictor of alcohol-related negative consequences (Neighbors et al., 2007). Additional research that combines positive and negative alcohol outcome expectancies with other determinants of collegiate drinking, such as perceived norms and drinking motives, is necessary in order to determine the relative contribution that these cognitions play in explaining drinking behavior.

Greater understanding of the relationship between alcohol outcome expectancies and drinking also may occur by investigating how drinking motives mediate alcohol outcome expectancies. Jones et al. (2001) theorized that beliefs about the anticipated effects of alcohol operate through motivation to influence drinking behavior. According to Cox and Klinger (1988, 2011), beliefs regarding the effects of alcohol consumption influence behavior through internal drinking motives because these beliefs relate to the direct chemical effects of drinking alcohol. Past research has indicated a mediational role of drinking motives (Read et al., 2003); however, existent literature on this relationship suffers from numerous limitations. In the following section, a mediational model that incorporates alcohol outcome expectancies, social norms, and drinking motives will be proposed. A review of the supporting research and possible limitations of the model will be discussed.

Hypothesized Model of Collegiate Drinking

In the previous sections, the scope of the problem that alcohol use presents on college campuses was presented, current prevention and treatment approaches were

reviewed, and several key theories of collegiate drinking were discussed. Based on the review of drinking trends, it is clear that this phenomenon is complex and represents a significant public health crisis. Existent collegiate drinking prevention and treatment strategies appear promising yet suffer from limitations. These approaches have produced equivocal outcomes among specific populations on campus (Carey et al., 2007). Further, the magnitude and duration of treatment effects has been poor (Carey et al., 2007; Cronce & Larimer, 2011; Scott-Sheldon et al., 2012). Although each theory presented, social norms, drinking motives, and alcohol outcome expectancies, has demonstrated success in predicting alcohol use intensity and alcohol-related negative consequences, research utilizing these constructs has only made a modest impact on rates of collegiate drinking (Dowdall & Wechsler, 2002; NIAAA, 2007).

Several criticisms have been made of past research conducted on college student drinking. Baer (2002) commented that most research had focused on single predictors of collegiate drinking and that given the complex array of personal and environment factors that contribute to this phenomenon, more multivariate research was needed. Baer listed alcohol outcome expectancies, social norms, and drinking motives as three important factors associated with collegiate drinking that warranted further investigation. Oei and Morawska (2004) noted that most research had been descriptive and lacked a "coherent theoretical approach" (p. 165), which produced findings that contributed little to prevention and treatment. To address these concerns, Dowdall and Weschler (2002) recommended that explanatory models be developed to account for multiple determinants of collegiate drinking. These authors also noted that models must be tested among

numerous student populations (Dowdall & Wechsler, 2002). Designing a multifactor model and testing model fit among groups shown to differ in their drinking patterns will enable researchers to identify variables that are meaningful to these students. Utilizing this information, tailored intervention efforts can be designed to target specific groups of students based on significant determinants of alcohol use.

In the following section, an integrative explanatory model of collegiate drinking is presented. Evidence will be reviewed that describes the mediating role of external drinking motives (social reinforcement and conformity) in explaining the relationships among injunctive norms, descriptive norms, alcohol use intensity, and alcohol-related negative consequences. Evidence also will be reviewed that describes the mediating role of internal drinking motives (enhancement and coping) in explaining the relationship among positive alcohol outcome expectancies, negative alcohol outcome expectancies, alcohol use intensity, and alcohol-related negative consequences. A case will be made for testing overall model fit as well as comparing model fit by gender and first-year student status. Before the model is presented, I will review several constructs not included in this model.

Constructs Not Included in the Model

Within the research literature, there have been many explanations presented for the prevalence of alcohol consumption and alcohol-related negative consequences among college students. In the proposed study, three of these explanations (social norms, drinking motives, outcome expectancies) were selected to form the framework of an integrative model of collegiate drinking. Each of these theories has been highlighted

within the literature as serving an important role in understanding drinking behaviors and informing prevention and treatment (Baer, 2002; Ham & Hope, 2003; NIAAA, 2002). Besides these theories, several other constructs have been identified as being related to collegiate drinking. Drinking refusal self-efficacy, access to alcohol, injunctive parental norms, and personality are four such factors. Examining these constructs will provide insight into the potential limitations of the model. A case will be made, however, that these factors are either indirectly addressed in the hypothesized model or are beyond the scope of the present study.

Drinking-refusal self-efficacy. Self-efficacy relative to college student drinking is described as the perceived ability to turn down offers to consume alcohol (Burke & Stephens, 1999; Oei & Morawska, 2004). It is believed that college students who are more confident in their ability to refuse an offer of alcohol will drink less and experience fewer problems compared to students who lack perceived self-efficacy. The perceived ability to refuse alcohol in specific situations, known as drinking refusal self-efficacy, has been found to be negatively associated with alcohol consumption among college students (Young, Oei, & Crook, 1991). In a study of Australian undergraduates ($N = 114$), Morawska and Oei (2005) found that drinking refusal self-efficacy helped to discriminate between binge, social, and heavy drinkers.

When studied alongside other determinants of collegiate drinking, drinking refusal self-efficacy has contributed significantly in predicting alcohol consumption and alcohol-related negative consequences. For instance, Young, Connor, Ricciardelli, and Saunders (2006) found that drinking refusal self-efficacy added additional variance over

positive alcohol outcome expectancies in the prediction of alcohol use quantity, drinking frequency, and severity of alcohol dependence in a sample of Australian college students. Further, Atwell, Abraham, and Duka (2011) examined drinking trends within a sample of undergraduates in the United Kingdom ($N = 230$) and found that a single-item measure of self-efficacy (confidence in staying within government drinking guidelines) made the greatest contribution in predicting hazardous drinking, compared to 31 other variables simultaneously regressed onto the total AUDIT score. Although these studies offer support for the inclusion of self-efficacy in collegiate drinking research, they suffer from several limitations, including the use of single item measures of self-efficacy (e.g., Atwell et al.) and having been conducted outside the United States.

In addition to the limitations of the research on self-efficacy, there is some question regarding the importance of this construct in explaining alcohol consumption. Bandura (1986) posited that self-efficacy and outcome expectancies were both important determinants of behavior. In his conceptualization of outcome expectancies, Bandura (2004) included social expectancies, or descriptive social norms, in order to represent the anticipated social consequences of behavior. In most cases, perceived self-efficacy has a direct impact on behavior as well as an indirect impact on behavior through outcome expectancies. Indeed, Bandura (1989) has argued that self-efficacy is the most central mechanism of personal agency and that perceived self-efficacy influenced outcome expectancies. He later noted, however, that self-efficacy did not play a central role in driving behavior in cases when outcomes "are not completely controlled by quality of performance" (p. 1180). Burke and Stephens (1999) suggested that this was true for

alcohol consumption among undergraduates and that in these cases, outcome expectancies, or the anticipated consequences of the behavior, played a more important role in predicting drinking. Because of the uncertain role of self-efficacy in predicting alcohol consumption as well as the lack of studies with a population of college students in the United States, more research is necessary to determine the relative contribution of this construct in explaining collegiate drinking. Two related constructs, alcohol outcome expectancies and descriptive social norms, are included in the hypothesized model. Social norms, in particular, also may account for factors within the environment that may influence drinking trends.

Access to alcohol. Several environmental variables have been found to be associated with collegiate drinking. In a review of the literature, Presley et al. (2002) identified a number of factors that influenced drinking behaviors, such as availability of alcohol and high density of nearby alcohol outlets. Wechsler, Kuo, Lee, and Dowdall (2000) found that easy access and cheap drink prices were significant correlates of underage drinking. In a longitudinal study of college alcohol policy enforcement from 1999 to 2001, Harris et al. (2010) observed greater declines in student binge drinking across time at schools where administrators reported increased enforcement.

Although access to alcohol has been found to be an important correlate of drinking, this variable possesses several important limitations. In a review of the collegiate drinking literature, Dowdall and Weschler (2002) admitted that despite the convincing evidence that the environment was related to drinking, it was unclear if greater access to alcohol resulted in increased drinking or if heavy drinkers self-selected

to reside in settings in which alcohol was more easily obtainable. These authors recommended the study of cognitive and social variables in settings that varied in drinking environment to learn more about this relationship (Dowdall & Wechsler, 2002). The need to study large cohorts of students to investigate these factors is a second limitation. Past research conducted on environmental correlates of drinking have utilized large national cohorts of college students (Wechsler et al., 2000). Significant and clinically meaningful differences among access to alcohol variables may be more difficult to observe when conducting research on one college campus with a relatively homogenous population.

Greater access to alcohol may provide more opportunities for students to be offered alcohol. Read et al. (2003) found that a variable measuring direct offers to use alcohol was associated with alcohol consumption. These authors also reported that the association between these variables was mediated by social drinking motives. In a review of peer influence and college drinking research, Borsari and Carey (2001) questioned the methods of assessing this construct (e.g., survey instruments) commenting that these measures of direct peer influence (i.e., direct offers to drink) were prone to socially desirable self-reporting. Examining indirect peer influence (i.e., social norms) may be more beneficial because it addresses how peers influence drinking behavior less overtly. Related to indirect peer influence is another important factor in collegiate drinking, parental influence.

Injunctive parental norms. According to Ham and Hope (2003), no strong evidence existed within the collegiate drinking literature to support the role of parental

influence in alcohol consumption among college students. Since this review was published, several studies have shown that greater parental injunctive or attitudinal norms are associated with increased alcohol use intensity. Abar et al. (2009) examined parent permissiveness towards alcohol consumption in a sample of first-year students ($N = 290$) and found that perceptions of parental permissibility of alcohol use was a consistent predictor of student drinking behaviors. Boyle and Boekeloo (2009) also found that favorable parental attitudes towards alcohol were significantly related to alcohol use intensity as well as alcohol-related negative consequences among a sample of first-year college students ($N = 265$). The positive relationship among parental injunctive norms, alcohol use intensity, and alcohol-related negative consequences among first-year students ($N = 818$) also was observed by Neighbors et al. (2007).

The emergent body of the literature on injunctive parent norms is promising and further study of this construct is necessary. Indeed, because most research on this relationship has been done with first-year college students during their first semester, it is unclear what role parental influence plays beyond the first few months of college. Abar and Turrisi (2008) found that peer alcohol use (i.e., drinking by the student's peers) mediated the association between parental attitudes and student alcohol consumption during the second semester of these student's first year in college, indicating that the impact of parental attitudes and communication on individual alcohol use may occur through peer drinking. This may suggest that parental attitudes regarding drinking influences selection of student peers. Once the student's peer group is selected, peer norms may become more salient. Future research to determine how these norms influence

drinking motives is necessary as possibly more conservative parental attitudes surrounding alcohol use may be negatively related to drinking for instrumental purposes.

Personality. A variable that has received considerable attention with the collegiate drinking literature is personality. Baer (2002) identified three separate personality traits related to alcohol consumption, impulsivity (i.e., low conscientiousness), extroversion (i.e. gregarious, excitement seeking), and neuroticism (i.e. tendency to experience negative affect). To help explain the role of these personality characteristics in explaining alcohol-related behaviors, researchers have examined their relationship to drinking motives. Stewart and Devine (2000) studied these variables in a sample of undergraduates ($N = 285$) and found that enhancement motives were predicted by high levels of extraversion and impulsivity and that coping motives were predicted by high neuroticism. Additional research has indicated that the association between these traits and alcohol use behavior among college students is mediated by drinking motives. Cooper et al. (2000) found that coping and enhancement motives partially mediated the relationship among neuroticism, extroversion, heavy episodic drinking, and alcohol-related negative consequences. More specifically, neuroticism (via coping motives) and extraversion (via enhancement motives) both directly and indirectly predicted alcohol outcome variables (Cooper et al., 2000). Research conducted by Mezquita et al. (2010) found support for the motivational pathways reported by Cooper et al. and also observed that enhancement motives partially mediated the association between high impulsivity and reported number of drinks per month.

Given the evidence in support of personality characteristics in explaining alcohol use and alcohol-related negative consequences, excluding these factors from the hypothesized model is a limitation. Including measures of impulsivity, extroversion, and neuroticism as exogenous variables would likely increase the explanatory power of the model and result in a greater understanding of how other factors influence collegiate drinking. Because of the role that drinking motives have played in partially mediating the associations among personality variables and alcohol use, the present study can be considered a first step in the process of investigating the contribution that personality plays in collegiate drinking when examined alongside social, cognitive, and motivational predicators of collegiate drinking. Based on the findings of the present study, a next step could potentially be to add these traits to the model. Because personality traits are relatively stable, they could be added as exogenous variables that influence drinking motives via alcohol outcome expectancies and social norms.

Drinking refusal self-efficacy, access to alcohol, parental injunctive norms, and personality each have been found to be related to collegiate drinking (Baer, 2002; Ham & Hope, 2003). However, several of these variables, including drinking refusal self-efficacy and parental injunctive norms, may not be as critical in understanding alcohol consumption compared to alcohol outcome expectancies and peer group social norms. Researchers may want to examine these variables together to determine their relative contribution. Once the model of social, cognitive, and motivational influences has been tested, incorporating personality characteristics and testing it within settings with varying access to alcohol, will improve the explanatory power of the model and increase its

effectiveness to inform tailored prevention and treatment efforts. An overview of the hypothesized model will now be described.

Drinking Motives as the Final Common Pathway

Drinking motives have been described as the final pathway to alcohol consumption. Through this gateway, more distal social and cognitive factors influence behavior (Cooper, 1994; Cox & Klinger, 1988). In the hypothesized model, alcohol outcome expectancies and social norms will predict alcohol use intensity and alcohol-related negative consequences through drinking motives. Internal motives (coping and enhancement) will be predicted by both positive and negative alcohol outcome expectancies. External motives (conformity and social) will be predicted by both injunctive and descriptive social norms. Each association between antecedent factors, drinking motives, and alcohol outcome variables will be positive. Alcohol-related negative consequences will be predicted by negative drinking motives (conformity and coping); whereas alcohol use intensity will be predicted by positive drinking motives (social and enhancement). Positive drinking motives will explain alcohol-related negative consequences indirectly through alcohol use intensity. Finally, the four antecedent variables (injunctive social norms, descriptive social norms, positive alcohol outcome expectancies, and negative alcohol outcome expectancies) will be allowed to co-vary. Figure 3 presents a visual representation of the hypothesized model. Each step of the path model will be explained in order to underscore areas of the literature that support the proposed associations among the variables as well as to describe how this study will address current limitations found within the research literature. I will conclude by

describing the two moderating variables (gender and first-year student status) that will be used in the multigroup test of invariance.
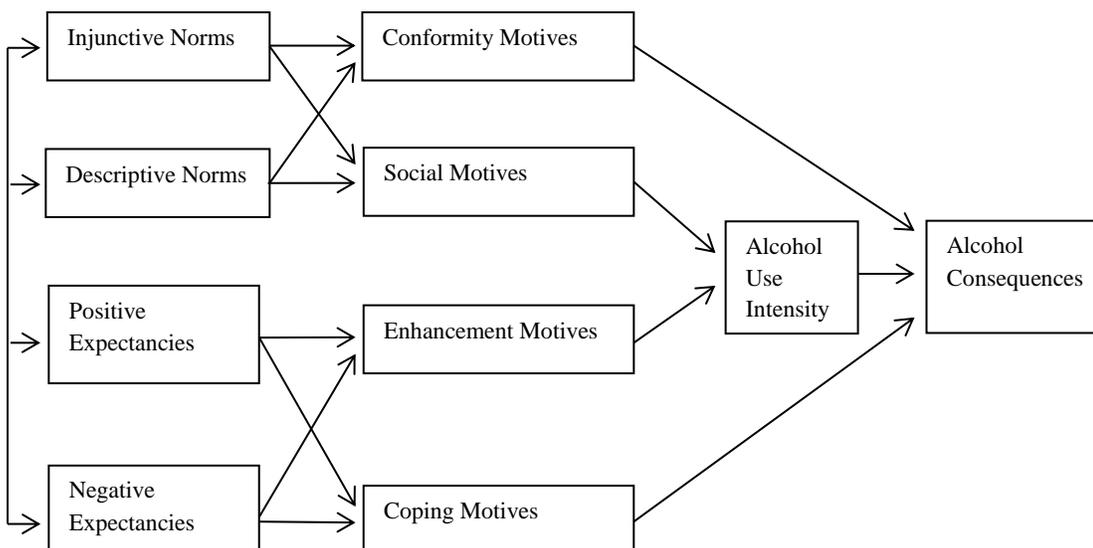
Figure 3. Hypothesized path model of collegiate drinking.

Alcohol Outcome Expectancies and Social Norms

When examined together, both alcohol outcome expectancies and social norms variables have each been found to predict alcohol use intensity and alcohol-related negative consequences (Neighbors et al., 2007). Correlational analyses of injunctive and descriptive norms and positive and negative alcohol outcome expectancies have indicated that these variables are related. Ham and Hope (2006) found that typical student same sex descriptive social norms had small to moderate significant associations with positive alcohol outcome expectancies ($r = .31, p < .001$) and negative alcohol outcome expectancies ($r = .15, p < .05$). Researchers also have found that positive and negative alcohol outcome expectancies possess unique characteristics (Fromme et al., 1993;

Valdivia & Stewart, 2005). For the purposes of this study, the reference groups for descriptive social norms and injunctive social norms are same sex typical student and closest friend, respectively. These reference groups were selected because when studied simultaneously, they separately predicted alcohol use intensity and did not present any multicollinearity concerns (Neighbors et al., 2007).

Neither alcohol outcome expectancies nor social norms have been found to mediate the other variable's relationship with alcohol use intensity or alcohol-related negative consequences. Wood et al. (2001) found that positive alcohol outcome expectancies did not mediate the relationship between descriptive social norms and alcohol use within a sample of undergraduates ($N = 399$). Further, Olthuis, Zamboanga, Martens, and Ham (2011) found that neither positive nor negative alcohol outcome expectancies mediated the relationship between injunctive norms and hazardous drinking in a sample of college student athletes ($N = 301$).

Allowing social norms and alcohol outcome expectancies to co-vary may provide insight regarding the relationship that these variables share and, consequently, how they influence drinking. According to the motivational model of alcohol use (Cox & Klinger, 1988, 2011), these variables represent distinct antecedents that operate through different drinking motives. Alcohol outcome expectancies relate to the intention to regulate affect using the chemical effects of alcohol, whereas social norms refer to the intention to regulate affect using the instrumental effects of alcohol (i.e., drinking for social approval or avoid social consequence). The associations among these variables may inform the theory proposed by Cox and Klinger. If social norms and alcohol outcome expectancies

possess large correlations with each other, the internal/external dimensions described within this model may need to be modified. Further, large correlations observed among these variables may lead to the enhancement of treatment and prevention efforts through the development of multicomponent interventions that address related factors (e.g., if a student reports inflated descriptive norms, including an alcohol expectancies intervention component may be appropriate if these variables are related).

Social Norms and External Motives

Within the literature, few studies have examined the associations among external motives and social norms. Read et al. (2003) found that social reinforcement motives partially mediated the predictive relationship between perceived peer drinking environment and alcohol consumption in a sample of undergraduates ($N = 388$). Perceived peer drinking environment was a five item composite variable developed by the researchers that included items relating to both closest friend descriptive norms and injunctive norms. Given the research (Lee et al., 2007) that has indicated that descriptive and injunctive social norms are distinct constructs that account for unique variance in alcohol use intensity, the hypothesized model addresses a limitation found within the study by Read et al. by including both variables. Further, this study builds upon the work of Read et al. by including conformity motives, a variable not included in their study.

Examining the associations among injunctive social norms, descriptive social norms, social motives, and conformity motives also may inform the social norms literature. More specifically, research linking social norms and alcohol-related negative consequences has produced inconsistent findings (Cho, 2006; Larimer et al., 2004;

Neighbors et al., 2007). By including positive and negative drinking motives, this mediational model may help explain past inconsistencies within the research literature. Social norms variables may possess a more robust relationship with alcohol-related negative consequences when they influence behavior through negative drinking motives. In this scenario, increased social norms would be associated with higher conformity motives, which increase the risk of alcohol-related negative consequences. Greater perceived peer use (descriptive norms) and permisssiveness (injunctive norms) among students who drink for social reinforcement purposes, also would the increase risk of alcohol-related negative consequences; however, this relationship would be mediated by increased alcohol use intensity.

Identifying the specific pathways of social norms influence on alcohol use intensity and alcohol-related negative consequences also may inform prevention and treatment strategies. Neighbors et al. (2004) found that a normative feedback intervention was more effective in reducing alcohol use and alcohol-related negative consequences among students who reported drinking for social reinforcement reasons. This study may help to explain these findings and build on this research by examining the mediating role of conformity motives. Given the direct association between conformity motives and alcohol-related negative consequences, more intensive approaches that incorporate personalized feedback may be needed for students who report that they drink to avoid social rejection.

Alcohol Outcome Expectancies and Internal Drinking Motives

There is evidence within the research literature that supports the role of drinking motives as a mediating variable between positive alcohol outcome expectancies and alcohol use intensity and alcohol-related negative consequences (Cooper et al., 1995; Kuntsche, Knibbe, Engels, & Gmel, 2007; Kuntsche et al., 2010); however, this research has examined the relationships among specific types of alcohol outcome expectancies. Read et al. (2003) found that tension reduction expectancies indirectly influenced alcohol-related negative consequences through coping motives; whereas, social lubrication expectancies indirectly influenced alcohol use (composite of quantity and frequency) via enhancement motives. An unhypothesized association among tension reduction expectancies and enhancement motives also was observed (Read et al., 2003). Because the different types of alcohol outcome expectancies were not uniquely linked to specific types of motives, these authors suggested that future research utilize global measures of alcohol outcome expectancies to examine the mediational relationship among alcohol outcome expectancies that represent broader conceptual domains and drinking outcomes (Read et al., 2003). This study responds to these findings by utilizing global measures of positive and negative alcohol outcome expectancies.

This study also will help explain the role that negative alcohol outcome expectancies play in influencing drinking outcomes. The research literature reveals inconsistent findings regarding the directionality of the association among negative alcohol outcome expectancies and drinking outcomes (Fromme et al., 1993; Neighbors et al., 2003). A possible reason for these inconsistencies is the inclusion of non-users in past

research. In these cases, negative alcohol outcome expectancies were found to be negatively associated with drinking outcomes (Agrawal et al., 2008; Fromme et al., 1993). Because the study will exclude abstainers from the analyses, findings from this research may help clarify this construct. This study also may inform the delivery of alcohol expectancy challenges; because these interventions focus primarily on positive alcohol outcome expectancies (i.e., social lubrication; Labbe & Maisto, 2011) and not "negative" alcohol outcome expectancies (i.e., cognitive impairment, risk and aggression) they may not address beliefs about alcohol that are particularly salient among current drinkers.

Drinking Motives, Alcohol Use Intensity, and Alcohol-related Negative Consequences

This study will provide further evidence regarding the specific role that each drinking motive plays in explaining alcohol use intensity and alcohol-related negative consequences. In particular, the hypothesized model will be used to test the direct associations among positive drinking motives and alcohol use intensity as well as negative drinking motives and alcohol-related negative consequences; paths that have found support within the literature (Martens, Rocha, et al., 2008; Merrill & Read, 2010). In addition to confirming these findings, the results of the study may contribute to current prevention and treatment efforts. Within the literature, there have been calls to develop tailored intervention programs that address specific factors that are meaningful to the individual student or subpopulation (Carey et al., 2007); however, there is limited guidance on how to "tailor" prevention and treatment efforts. Kuntsche et al. (2006)

recommended that strategies be tailored based on specific drinking motives, but these authors did not provide any direction or recommendations on what components (e.g., personalized normative feedback, alcohol expectancy challenge) to include for each motives-based intervention. Findings from the study may offer insight into how to structure tailored interventions and which components may be appropriate for each specific intervention.

Gender and First-year Status as Moderators

Model fit will be examined by gender (males and females) and first-year student status (first-year students and upperclassmen). These groups were selected because differences in alcohol use intensity and alcohol-related negative consequences among these students have been observed within the literature. Although higher rates of alcohol use intensity have been documented among male college students (Engs & Hanson, 1990; McCabe et al., 2005), women report higher prevalence of alcohol-related sexual assault (Howard et al., 2008) and other physical consequences associated with alcohol consumption (Sugarman et al., 2009). Further, men and women possess physiological differences related to alcohol use; women achieve higher blood alcohol concentrations compared to men at equivalent consumption levels (White et al., 2002). Though these differences are well documented, questions remain regarding how gender may influence the role that social norms and alcohol outcome expectancies play in predicting drinking. Testing model invariance by gender will increase the specificity of tailored interventions and help clarify the associations among social norms, alcohol outcome expectancies, drinking motives, and alcohol use across gender.

First-year students are another population on college campuses who appear to be susceptible to alcohol-related negative consequences due to heavy drinking (Borsari et al., 2007). Researchers have found that these students report higher levels of descriptive social norms (Pedersen et al., 2010) and conformity motives (Martens, Rocha, et al., 2008) compared to upperclassmen. Given these differences, comparing model fit using first-year student status is warranted. Additionally, considering that students are often exposed to prevention strategies during their first year of college (e.g., requirement to complete multicomponent web-based educational intervention), taking a closer look at this population may be particularly relevant to program enhancement.

Summary

In this chapter, a review of the collegiate drinking literature was conducted in order to identify the scope of the problem, explore existent prevention and treatment interventions, and discuss three key theories of collegiate drinking: social norms, alcohol outcome expectancies, and drinking motives. An integrative explanatory model of collegiate drinking that combines each theory was proposed in order to address current limitations within the research literature. In Chapter III, the methodology of the study, including instrumentation and data collection procedures, will be described and research questions and hypotheses will be presented.

CHAPTER III

METHODOLOGY

In Chapter I, research questions were presented to examine the role of drinking motives, social norms, and alcohol outcome expectancies in explaining alcohol use intensity and alcohol-related negative consequences. In Chapter II, a review of relevant literature revealed a lack of research incorporating multiple determinants of collegiate drinking. Accordingly, the current study will contribute to the literature by providing an integrative approach combining the constructs of social norms, alcohol outcome expectancies, and drinking motives to examine collegiate alcohol use intensity and alcohol-related negative consequences. I will investigate the role of drinking motives in explaining the associations among social norms, alcohol outcome expectancies, alcohol use intensity, and alcohol-related negative consequences. The hypothesized model (Figure 3) will be tested to determine invariance by gender and first-year college student status. In the present chapter, I detail the research hypotheses of the current study as well as the participants, instrumentation, procedures for data collection, and the data analyses proposed to address the research questions. Further, the results of the pilot study will be presented and discussed.

Research Questions and Hypotheses

The following research questions and hypotheses are proposed:

Research Question 1: Does the integrative model of collegiate drinking based on the motivational model of alcohol use (Cox & Klinger, 1988) provide an acceptable fit for the data?

Hypothesis 1: It is expected that the model proposed will be a satisfactory fit for the data.

Research Question 2: How well do social norms (descriptive and injunctive) predict external (social reinforcement and conformity) drinking motives?

Hypothesis 2: It is hypothesized that injunctive and descriptive norms will positively predict social reinforcement and conformity motives.

Research Question 3: How well do alcohol outcome expectancies (positive and negative) predict internal (coping and enhancement) drinking motives?

Hypothesis 3: Both positive and negative alcohol outcome expectancies are expected to positively predict coping and enhancement motives.

Research Question 4: How well do positive drinking motives (social and enhancement) predict alcohol use intensity?

Hypothesis 4: It is hypothesized that both social and enhancement motives will positively predict alcohol use intensity.

Research Question 5: How well do negative drinking motives (conformity and coping) predict alcohol-related negative consequences?

Hypothesis 5: Both negative drinking motives are expected to positively predict alcohol-related negative consequences.

Research Question 6: How well do conformity motives mediate the relationship between social norms variables (descriptive and injunctive norms) and alcohol-related negative consequences?

Hypothesis 6: It is hypothesized that conformity motives will mediate the relationship between descriptive and injunctive norms and alcohol-related negative consequences.

Research Question 7: How well do coping motives mediate the relationship between alcohol outcome expectancies (positive and negative) and alcohol-related negative consequences?

Hypothesis 7: It is expected that coping motives will mediate the relationship between alcohol outcome expectancies (positive and negative) and alcohol-related negative consequences.

Research Question 8: How well do social motives mediate the relationship between social norms variables (descriptive and injunctive norms) and alcohol use intensity?

Hypothesis 8: Social motives are expected to mediate the relationship between social norms variables (descriptive and injunctive norms) and alcohol use intensity.

Research Question 9: How well do enhancement motives mediate the relationship between positive and negative alcohol outcome expectancies and alcohol use intensity?

Hypothesis 9: Enhancement motives are hypothesized to mediate the relationship between positive and negative alcohol outcome expectancies and alcohol use intensity.

Research Question 10: How well does alcohol use intensity mediate the relationship between social and enhancement motives and alcohol-related negative consequences?

Hypothesis 10: It is hypothesized that alcohol use intensity will mediate the relationship between social and enhancement motives and alcohol-related negative consequences.

Research Question 11: Does the proposed integrated model of collegiate drinking provide an acceptable fit for both male and female college students?

Hypothesis 11: It is expected that the model will be a good fit for both male and female students; however, associations between alcohol outcome expectancies, social norms, drinking motives, alcohol use intensity, and alcohol-related negative consequences will be stronger among male students.

Research Question 12: Does the proposed integrated model of collegiate drinking provide an acceptable fit for both first-year and upper class college students?

Hypothesis 12: The model will be an acceptable fit for both first-year students and upperclassmen; however, associations between alcohol outcome expectancies, social norms, drinking motives, alcohol use intensity, and alcohol-related negative consequences will be stronger among first-year students.

Participants

To recruit undergraduate student participants between the ages of 18 and 24, I sampled from a mid-sized public university located in the Southeastern United States. Purposeful sampling from courses within this University was used to collect the data. Students were sampled from undergraduate classes within the academic disciplines of Counseling, Public Health Education, Sociology, Communication Studies, and Kinesiology. Demographics that will be collected from the sample include age, academic year, sex, full time status, Greek organization affiliation, athlete status, race/ethnicity,

current residence, grade point average, past judicial history, first generation college student status, family history of alcohol problems, and age of first drink.

To determine sample size, general guidelines proposed for the use of Path Analysis and Structural Equation Modeling (SEM) were considered. There has been much discussion within the literature regarding the rules to determine adequate sample sizes. Kenny (2011) recommended a minimum of 200 observations and suggested ratios of observations per parameter that range from 5:1 to 10:1 for more complex models. Similarly, Kline (2010) recommended no fewer than 200 observations and stated that a ratio of 10:1 is acceptable; however, he argued that a ratio of 20:1 observations per parameter is ideal. Schumacker and Lomax (2010) described acceptable observation and parameter ratios ranging from 5:1 to 10:1.

Based on the complexity and size of the model, I used the 10:1 ratio of observations to parameters. Research questions one through ten are based on a path model that includes four exogenous variables (descriptive norms, injunctive norms, positive alcohol outcome expectancies, and negative alcohol outcome expectancies), six endogenous variables (coping motives, conformity motives, enhancement motives, social motives, alcohol use intensity, and alcohol-related negative consequences), and 29 total parameters. These parameters include 13 paths, six disturbance variances, four exogenous variances, and six covariances of exogenous variables. Further, disturbance variances among the six drinking motives will be correlated. Using the ratio of 10:1 observations per parameter, the desired sample size to investigate research questions one through ten is 290 participants.

Testing for invariance between groups is the method of analysis for research questions 11 and 12. This process requires larger sample sizes than traditional path analysis because it involves comparing two separate models, a free model that allows path coefficients to be estimated independently and a constrained model in which path coefficients are constrained to be equal to each other (i.e., groups are constrained to co-vary). Kenny (2011) suggested that preferably there should be 200 participants in each group. Because the multi-group tests of invariance of gender and first-year student status will be conducted separately, allowing for overlap between gender and class year, 400 total participants were desired for this study according to Kenny's guidelines. As such, efforts were made to recruit undergraduates representing each of the following groups: first year students, upperclassmen (i.e., none-first year students), male college students, and female college students.

To examine the mediational role of specific drinking motives on the association between social norms, alcohol outcome expectancies, and alcohol use intensity, it is critical that participants have used alcohol in the past. This is because the measure that assesses for drinking motives, the Drinking Motives Measure—Revised (DMM-R; Cooper, 1994), asks participants to report how often they drink for reasons associated with each motive. Therefore, abstinent college students will be unable to answer these questions because they do not consume alcohol. Although some studies using the DMM-R have not addressed the inclusion of abstainers (MacLean & Lecci, 2000), previous studies have included participants whose frequency of alcohol use has ranged from the past 30 days (Martens, Rocha, et al., 2008) to the past year (Kuntsche et al., 2010). Given

that several of the other measures included this study (e.g., AUIDT-C, BYAACQ) assess past year drinking behaviors, participants who have consumed alcohol during the past year were included. Based on national samples, the annual prevalence of alcohol use among college students is 82% (Core Institute, 2012) and these rates are higher among first-year college students (Borsari et al., 2007). To obtain a sample of 400 past year drinkers, I sought to recruit 487 participants (82% of 487 equals approximately 400). A sample of 487 will increase the likelihood that 400 of these participants will have consumed alcohol during the past year. This sample size also accounts for the possibility of missing data or otherwise unusable responses.

Instrumentation

The instrumentation for the study consisted of (a) the Comprehensive Effects of Alcohol Questionnaire (CEOAQ; Fromme et al., 1993), (b) the Drinking Motives Measure-Revised (DMM-R; Cooper, 1994), (c) the Alcohol Use Disorder Identification Test- Consumption (AUDIT-C; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001), (d) the Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ; Kahler et al., 2005), (e) the Injunctive Norms Rating Questionnaire (Baer, 1994), (f) three items from the Alcohol and Other Drug Survey (Thombs, 1999) that will assess descriptive norms, and (g) a brief demographics questionnaire. Each of these questionnaires are presented below.

Comprehensive Effects of Alcohol Questionnaire

The Comprehensive Effects of Alcohol Questionnaire (CEOAQ; Fromme et al., 1993) was used to measure positive and negative alcohol outcome expectancies.

Developed for use with collegiate populations (Fromme et al., 1993), the CEOAQ

contains 38 statements about the chemical effects of alcohol use for participants to rate

their level of agreement from 1 (*disagree*) to 4 (*agree*). The CEOAQ is comprised of four

positive alcohol outcome expectancy subscales: sociability (e.g., I would feel energetic),

tension reduction (e.g., I would feel calm), liquid courage (e.g., I would feel courageous),

and sexuality (e.g., I would feel sexy), as well as three negative outcome expectancy

subscales: cognitive and behavioral impairment (e.g., My senses would be dulled), risk

and aggression (e.g., I would be dominant), and negative self-perception (e.g., I would

feel guilty).

Past research has indicated that outcome expectancies should be conceptualized as

broad domains because specific subtypes of outcome expectancies have demonstrated

high interdependence (for a full review, see Jones et al., 2001). Additionally, in a study of

the mediational role of drinking motives in explaining the association between alcohol

outcome expectancies and alcohol use, Read et al. (2003) found that different types of

alcohol outcome expectancies were not uniquely related to specific drinking motives. For

the purposes of this study, the four positive alcohol outcome expectancy subscales (20

items) and three negative alcohol outcome expectancy subscales (18 items) were

combined to create separate global positive and negative scores. As global composite

scores of positive and negative alcohol expectancies, the CEOAQ has demonstrated

acceptable temporal stability over a two-month period for both positive alcohol outcome

expectancies ($r = .66 - .72$) and negative alcohol outcome expectancies ($r = .75 - .81$;

Fromme et al., 1993). Further, internal consistency has been good with alpha levels

ranging from .81 (Olthuis et al., 2011) to .91 (Neighbors et al., 2003) for positive alcohol

outcome expectancies and .76 (Olthuis et al., 2011) to .85 (Neighbors et al., 2003) for

negative alcohol outcome expectancies.

Although negative alcohol outcome expectancies have been theorized as serving

as a protective factor against heavy drinking (i.e., increased negative outcome

expectancies result in decreased use; Jones et al., 2001), both the positive and negative

alcohol outcome expectancy subscales of the CEOAQ have been found to be positively

associated with alcohol use and alcohol-related negative consequences in collegiate

samples. For instance, Neighbors et al. (2007) found that negative alcohol outcome

expectancies positively predicted alcohol-related negative consequences. Similarly,

Hasking et al. (2011) found that negative alcohol outcome expectancies positively

predicted hazardous drinking as measured by the AUDIT. Based on past research

utilizing the combined negative alcohol outcome expectancies subscale of the CEOAQ,

for the purposes of the present study it was expected that this subscale will be positively

associated with alcohol use intensity and alcohol-related negative consequences.

Alcohol Use Disorder Identification Test—Consumption

The endogenous variable alcohol use intensity was measured utilizing the Alcohol

Use Disorder Identification Test—Consumption (AUDIT-C; Bush et al., 1998). The

AUDIT-C is an abbreviated version of the Alcohol Use Disorder Identification Test

(AUDIT; Babor et al., 2001) that contains three questions pertaining to alcohol use.

These items include frequency of alcohol use ("how often do you have a drink containing

alcohol?"), quantity of alcohol use ("how many drinks containing alcohol do you have on

a typical day when you are drinking?"), and frequency of heavy episodic drinking ("for

women, how often do you have four or more drinks on one occasion?" and "for men, how

often do you have five or more drinks on one occasion?"). Gender-specific definitions of

binge-drinking were selected because past research has indicated that a standardized

definition of 6 or more drinks on one occasion resulted in under-identification of

hazardous users among college women (Olthuis et al., 2011). Each item is scored on a

Likert scale of 0-4 and the responses from these questions are summed to provide an

overall scale score of alcohol use intensity. Higher scores reflect more intense

involvement with alcohol. Previous studies with college students have utilized the

AUDIT-C to assess past year intensity of alcohol use (Thombs et al., 2009) and past

research has demonstrated that the combination of quantity and frequency measures of

alcohol use result in good internal consistency, with Cronbach's alphas ranging from .80

(Lewis & Myers, 2010) to .86 (Lewis & Gouker, 2007). The AUDIT-C also has

demonstrated strong criterion validity in detecting heavy drinking; DeMartini and Carey

(2012) found that the AUDIT-C was a better predictor of at-risk drinking than the full

AUDIT within a sample of college students.

Drinking Motives Measure—Revised

The Drinking Motives Measure-Revised (DMM-R; Cooper, 1994) is a 20-item

instrument based on the motivational model of alcohol use (Cox & Klinger, 1988)

designed to measure four categories of motives for alcohol use: social (e.g., "to celebrate

special occasions with friends"), enhancement (e.g., "because it gives you a pleasant

feeling"), coping (e.g., "to forget about your problems"), and conformity (e.g., "because

your friends pressure you to drink"). Each of the four subscales contains five items and respondents are asked to rate how often they consume alcohol for each of the reasons provided. Response options are scored on a five-point scale ranging from 1 (*almost never/never*) to 5 (*almost always/always*). These responses are averaged to create a composite score for each subscale. Higher scores indicate stronger endorsement of the reasons for alcohol use represented by the specific drinking motive.

The DMM-R has demonstrated strong criterion validity and internal consistency. Among both adolescent and collegiate samples, positive (social and enhancement) and negative (coping and conformity) drinking motives have shown distinct relationships with alcohol use behaviors; whereas positive motives predict alcohol use, negative motives have been found to predict alcohol-related negative consequences after controlling for alcohol use (Cooper, 1994; Martens, Rocha, et al., 2008; Merrill & Read, 2010; Yurasek et al., 2012). The four-factor model of the DMM-R has been confirmed with collegiate populations in multiple studies (MacLean & Lecci, 2000; Martens, Rocha et al., 2008) and each subscale has demonstrated good internal consistency with alpha levels in a recent study by Merrill and Read (2010) as .84 for coping, .84 for enhancement, .87 for social reinforcement, and .85 for conformity.

Injunctive Norms Rating Questionnaire

Baer's (1994) measure, the Injunctive Norms Rating Questionnaire, was used to assess perceived injunctive norms. This measure assesses the friends of the participant's perceived approval of the four specific behaviors: drinking every weekend, daily, after driving, and enough to pass out. Response options are based on a 7-point Likert scale

ranging from 1 (*strong disapproval*) to 7 (*strong approval*) and a composite injunctive norms score will be taken as the mean of the four corresponding items. Injunctive norms of the participant's friends, as operationalized using the Injunctive Norms Rating Questionnaire, has been found to predict alcohol use (Neighbors et al., 2008) and alcohol-related negative consequences (Labrie et al., 2010) in collegiate samples. Higher scores indicate greater perceived acceptance of high-risk alcohol use by the participant's friends. Cronbach's alpha for this scale has ranged from .72 (Neighbors et al., 2007) to .73 (Labrie et al., 2010; Neighbors et al., 2007), demonstrating acceptable internal consistency.

Brief Young Adult Alcohol Consequences Questionnaire

Alcohol related negative consequences were measured using the Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ; Kahler et al., 2005). The BYAACQ assesses 24 alcohol-related negative consequences during the past year using a dichotomous (yes/no) format. Types of alcohol-related consequences include social-interpersonal, academic/occupational, impaired control, engagement in high risk-behaviors, and experience of physiological dependence symptoms. "Yes" responses are summed to create a total score on the measure. The BYAACQ was designed for use with college students and has demonstrated strong concurrent validity with high correlations with other alcohol-related negative consequences questionnaires, including the Rutgers Alcohol Problems Index ($r = .78$) and the full length Young Adult Alcohol Consequences Questionnaire ($r = .95$; Kahler et al., 2005). The BYAACQ also has shown good internal

consistency; in a recent study by DeMartini and Carey (2012), the BYAACQ had a Cronbach's alpha of .86.

Descriptive Norms Items

Three items adapted from the Alcohol and Other Drug Survey (Thombs, 1999) were used to measure perceived prevalence of alcohol use intensity by typical students of the same sex at the participant's University. These items ask about frequency of alcohol use ("how often do you think a typical student of the same sex at your university has a drink containing alcohol?"), quantity of alcohol use ("how many drinks containing alcohol do you think a typical student of the same sex at your university has on a typical day when drinking?"), and frequency of heavy episodic drinking ("how often do you think a typical female student at your university has 4 or more drinks on one occasion?" and "how often do you think a typical male student of the same sex at your university has 5 or more drinks on one occasion?"). Response options for these items mirror the AUDIT-C and are summed to provide an overall score representing perceived prevalence of alcohol use intensity. Past research has demonstrated that this composite score is a significant predictor of alcohol consumption within a collegiate sample (Lewis & Clemens, 2008) and that it possesses acceptable internal consistency. In a study by Lewis and Clemens, the Cronbach's alpha for this variable was .78.

Demographics Questionnaire

A range of socio-demographic items was collected. A researcher generated socio-demographic form was provided as part of the survey packet. The socio-demographic form will be comprised of 16 items exploring characteristics that include academic year,

student status (full/part time), sex, age, race/ethnicity, current residence, participation in intercollegiate athletics, Greek organization affiliation, grade point average, age of first drink (beyond just a sip), past judicial history, family history of alcohol problems, and first generation college student status. Further, an item assessing heavy episodic drinking (i.e., 5 or more drinks in a sitting) during the past two weeks was included in order to compare rates of binge of drinking within the sample to national statistics (Core Survey, 2012).

Items included in the demographic form were selected because they have been found to be associated with alcohol use intensity and are often assessed in the collegiate alcohol literature (e.g., grade point average, race/ethnicity). Researchers have observed increased levels of alcohol use intensity among students affiliated with Greek organizations (McCabe et al., 2005) and college athletics (Nelson & Wechsler, 2001). Further, past judicial history (LaBrie, Tawalbeh, & Earleywine, 2006) and age of first use (Hingson & Zha, 2009) have been associated with alcohol-related negative consequences. Also associated with alcohol-related negative consequences among undergraduates are parent communication (Boyle & Boekeloo, 2009) and poor adjustment to college life (LaBrie et al., 2012). Although examining these variables is beyond the scope of this study, assessing parental level of education may provide some insight regarding these factors, given that first-generation college students perceive less parent support and report more stress during the transition to college than their continuing-generation peers (Sy, Fong, Carter, Boehme, Alpert, 2011). Additionally, an item was included to assess number of family members who have had a problem with alcohol or other drugs. This

item was included given past research indicating a link between family history and harmful collegiate drinking (Braitman et al., 2009). Finally, sex and class year status were included in the demographic form in order to conduct the multigroup analysis described in research questions 11 and 12.

Procedures

To recruit participants, course instructors of undergraduate classes in the Departments of Counseling and Educational Development, Public Health, Sociology, Communication Studies, and Kinesiology in a mid-sized public university were contacted for participation in the study. Each instructor received an email explaining the purpose of the study and requesting permission to collect data in their classroom. Once permission from instructors was obtained, the researcher visited each class and invite students to participate. I attempted to collect data at the beginning of class in order to ensure maximum participation. To decrease the odds that participants would respond in a socially desirable manner, the author requested a waiver of signed informed consent from the IRB so that no identifying information would be collected during the survey administration. Additionally, participants received the survey packet in a manila envelope, which they used to conceal their survey before returning it. Rather than returning the sealed envelope directly to me, participants were asked to place their completed survey in a cardboard box located in the front of the classroom. These procedures were intended to alleviate any concern among participants that their survey packet may be traced back to them.

I explained the purpose of the study and described the voluntary and confidential nature of participation. To students electing to participate, I provided an informed consent form (Appendix A) describing the nature of the study, any potential risks, the confidential nature of the study, and voluntary participation. Participants were allowed to withdraw from the study at any time, without repercussion. If students chose not to participate in the study, the course instructor selected an alternative activity/directive for them to complete in the classroom while others complete the study. I then distributed the survey packet that included 109 items and was anticipated to take approximately 10-15 minutes to complete. Due to the sensitive nature of alcohol use, each participant received a list of substance abuse and psychological counseling resources on campus (e.g., Counseling and Testing Center, Vacc Counseling and Consulting Clinic) and in the community.

Data Analyses

This study tested an integrative model of collegiate drinking that incorporated multiple determents of use, including perceived norms of drinking prevalence and acceptance, beliefs about the positive and negative effects of alcohol consumption, and motives to drink. Table 1 includes descriptions of the research questions, hypotheses, and data analysis strategies. All survey data was entered into SPSS Version 20.0 computer software package. Once entered, demographic data was assessed using descriptive statistics to describe participant academic year, student status, sex, age, race/ethnicity, residence, involvement in intercollegiate athletics, Greek organization affiliation, grade point average, age of first drink, past judicial history, family history, occurrence of heavy episodic drinking, and first generation college student status.

To evaluate assumptions associated with Path Analysis, several preliminary analyses were conducted. Reliability analyses were conducted across all variables by calculating Cronbach's alpha for an estimate of internal consistency. Pearson product moment correlations were performed on all variables to assess for multicollinearity, as well as general relationships between variables. Skewness and kurtosis statistics were consulted to determine if the distribution of each variable was normal. Outliers were identified to evaluate their impact on the distribution and to approximate their source (e.g., data entry error by the student-research).

Table 1

Research Questions, Hypotheses, and Analyses

Research Question	Independent Variables	Dependent Variables	Analysis
1. Does the integrative model of collegiate drinking based on the motivational model of alcohol use (Cox & Klinger, 1988) provide an acceptable fit for the data?	Positive alcohol expectancies (CEOAQ) Negative alcohol expectancies (CEOAQ) Descriptive social norms (Descriptive Norms Items) Injunctive social norms (Injunctive Norms Rating Questionnaire) Coping motives (DDM-R) Conformity motives (DDM-R) Social reinforcement motives (DMM-R) Enhancement motives (DMM-R)	Alcohol use intensity (AUDIT-C) Alcohol-related negative consequences (BYAACQ)	Path Analysis
2. How well do social norms (descriptive and injunctive) predict external (social reinforcement and conformity) drinking motives?	Descriptive social norms (Descriptive Norms Items) Injunctive social norms (Injunctive Norms Rating Questionnaire)	Conformity motives (DDM-R) Social reinforcement motives (DMM-R)	Path Analysis
3. How well do alcohol outcome expectancies (positive and negative) predict internal (coping and enhancement) drinking motives?	Positive alcohol expectancies (CEOAQ) Negative alcohol expectancies (CEOAQ)	Coping motives (DDM-R) Enhancement motives (DMM-R)	Path Analysis

Table 1 (cont.)

Research Question	Independent Variables	Dependent Variables	Analysis
4. How well do positive drinking motives (social and enhancement) predict alcohol use intensity?	Social reinforcement motives (DMM-R) Enhancement motives (DMM-R)	Alcohol use intensity (AUDIT-C)	Path Analysis
5. How well do negative drinking motives (conformity and coping) predict alcohol-related negative consequences?	Coping motives (DDM-R) Conformity motives (DDM-R)	Alcohol-related negative consequences (BYAACQ)	Path Analysis
6. How well do conformity motives mediate the relationship between social norms variables (descriptive and injunctive norms) and alcohol-related negative consequences?	Descriptive social norms (Descriptive Norms Items) Injunctive social norms (Injunctive Norms Rating Questionnaire) Conformity motives (DDM-R)	Alcohol-related negative consequences (BYAACQ)	Bootstrapping
7. How well do coping motives mediate the relationship between alcohol outcome expectancies (positive and negative) and alcohol-related negative consequences?	Positive alcohol expectancies (CEOAQ) Negative alcohol expectancies (CEOAQ) Coping motives (DDM-R)	Alcohol-related negative consequences (BYAACQ)	Bootstrapping
8. How well do social motives mediate the relationship between social norms variables (descriptive and injunctive norms) and alcohol use intensity?	Descriptive social norms (Descriptive Norms Items) Injunctive social norms (Injunctive Norms Rating Questionnaire) Social reinforcement motives (DMM-R)	Alcohol use intensity (AUDIT-C)	Bootstrapping
9. How well do enhancement motives mediate the relationship between positive and negative alcohol outcome expectancies and alcohol use intensity?	Positive alcohol expectancies (CEOAQ) Negative alcohol expectancies (CEOAQ) Enhancement motives (DMM-R)	Alcohol use intensity (AUDIT-C)	Bootstrapping

Table 1 (cont.)

Research Question	Independent Variables	Dependent Variables	Analysis
12. Does the proposed integrated model of collegiate drinking provide an acceptable fit for both first-year and upper class college students?	Positive alcohol expectancies (CEOAQ) Negative alcohol expectancies (CEOAQ) Descriptive social norms (Descriptive Norms Items) Injunctive social norms (Injunctive Norms Rating Questionnaire) Coping motives (DDM-R) Conformity motives (DDM-R) Social reinforcement motives (DMM-R) Enhancement motives (DMM-R)	Alcohol use intensity (AUDIT-C) Alcohol-related negative consequences (BYAACQ)	Test of Invariance Multigroup Path Analysis

In order to specify the proposed structural path model, a covariance matrix containing all exogenous and endogenous variables was generated and entered into the LISREL Volume 8.8 computer software program. Path Analysis was selected because this method permits for the examination of multiple hypothesized paths of direct and indirect influence simultaneously and provides indices of overall model fit (Kline, 2010). Hypothesis 1, that the hypothesized model will be a satisfactory fit for the data, was explained using multiple indices of fit, such as model Chi-Square, root mean square error of approximation (RMSEA), close fit index (CFI), and the standardized root mean square residual (SRMR). Modification indices were consulted and alterations made to the model to improve overall fit. Hypotheses 2-5 were explained by inspecting relevant path coefficients, standard errors, and *t* values. Hypotheses 6-10 were explained by using a non-parametric bias-corrected bootstrapping procedure developed by Preacher and Hayes (2008). Finally, Hypotheses 11-12 were explained by inspecting standardized path

coefficients and multiple indices of fit, as well as by conducting a model Chi Square difference test to compare the restrained and unconstrained models.

Limitations

Several a priori limitations must be considered in regards to the study. The data was collected from one mid-sized public University located in the Southeastern United States, thereby limiting the generalizability of the findings. Further, participants were recruited utilizing purposeful sampling, which increases the chances that the data will be skewed. The data was collected using self-report measures, which introduces the possibility of socially desirable responses by participants. To reduce the likelihood of desirable responding, a waiver of signed consent was requested from the IRB and participants were provided with an envelope to place their survey packet in before submitting it to the researcher. Finally, a limitation of using manifest variables in the data analysis is the assumption that all variables are measured without error (Kline, 2010). To address this concern, instruments that have had high levels of reliability in previous research were selected for data collection. Kelloway (1998) defined high levels of reliability as Cronbach's alphas greater than .70.

An additional limitation of the present study is that alcohol use intensity and alcohol-related negative consequences may be explained by variables omitted from the hypothesized model. Researchers have found that factors such as self-efficacy (Atwell et al., 2011), parental influence (Neighbors et al., 2007), and certain personality traits predict alcohol consumption among college students. Excluding these constructs may reduce the utility of this model in explaining alcohol use and alcohol-related negative

consequences; however, evidence found within the research literature suggests that these factors may be partially accounted for by variables currently included in the model. For instance, the relationship between specific personality traits (e.g., sensation seeking, neuroticism, extroversion) and alcohol use has been found to be mediated by drinking motives (Cooper et al., 1995, 2000; Kuntsche, von Fischer, & Gmel, 2008; Mezquita et al., 2010). Further, Abar and Turrisi (2008) found that the association between parental influence and alcohol consumption was mediated by perceived use of alcohol by the student's peers, indicating that descriptive norms play an important role in explaining this relationship. Although self-efficacy (perceived ability to successfully perform a behavior) has been argued by social cognitive theorists (Oei & Morawska, 2004) to play an essential role in explaining behavior, it has been suggested that alcohol outcome expectancies may play a more important role in alcohol use because drinking outcomes are "not completely controlled by quality of performance" (Bandura, 1989, p. 1180). Despite the relationships between these constructs and factors included in the present study, excluding these factors may reduce the explanatory power of the model to be tested. Future research may seek to examine the theoretical associations between personality, self-efficacy, and parental influences with the present model in order to expand its comprehensiveness in accounting for alcohol use and alcohol-related negative consequences.

Pilot Study

A pilot study was conducted with the purpose of testing the procedures for the full dissertation study. The aims of the pilot study were to (a) test the procedures and

instruments to be utilized in the full dissertation study, (b) determine the length of time

necessary to complete the survey packet, (c) acquire feedback related to the clarity of

items and directions, and (d) conduct a preliminary examination of the relationships

among the variables. A total of 23 participants were presented with the survey packet, as

well as a pilot study feedback form (Appendix C) to obtain information on duration

required to complete the questionnaire and to ascertain the clarity of the items in the

survey packet and study procedures. Descriptive statistics of the pilot study participants,

correlations among the constructs in the study, and reliability data will be presented. Data

collected from the pilot study feedback form also will be described. Implications that are

discussed include possible changes to the survey packet format and procedures for the

main study.

Instrumentation

Participants first completed the 107-item survey packet. Measures included in the

survey packets were organized in the following order: (a) the 38 item Comprehensive

Effects of Alcohol Questionnaire (CEOAQ; Fromme et al., 1993); (b) the four item

Injunctive Norms Rating Questionnaire (Baer, 1994); (c) three items from the Alcohol

and Drug Survey (Thombs, 1999) that assessed descriptive norms; (d) one item that

inquired about past year alcohol consumption; (e) the 20-item Drinking Motives

Measure-Revised (DMM-R; Cooper, 1994); (f) the three item Alcohol Use Disorder

Identification Test—Consumption (AUDIT-C; Babor et al., 2001); (g) the 24-item Brief

Young Adult Alcohol Consequences Questionnaire (BYAACQ; Kahler et al., 2005); and

(h) a 14-item demographics questionnaire. Pilot study participants also completed a pilot

study feedback form (see Appendix C) to evaluate the efficacy of study procedures.

Cronbach's alpha coefficients were calculated for the total scores of the AUDIT-C,

BYAACQ, Injunctive Norms Rating Form, and for the items assessing descriptive norms.

Reliability analyses also were conducted for the subscale scores of the CEOAQ (positive

and negative expectancy scores) and the DMM-R (coping motives, conforming motives,

enhancement motives, and social motives). Each measure and subscales demonstrated

acceptable levels of internal consistency of above .70 with the exception of the

descriptive norms questionnaire with a Cronbach's alpha of .63. Reliability calculations

for all instruments and subscales are listed in Table 2.

Table 2

Number of Items per Scale and Alpha Coefficients ($n = 23$)

Instrument/Subscale	Number of Items	Alpha Coefficient
Positive Outcome Expectancies	20	.90
Negative Outcome Expectancies	18	.92
Injunctive Norms Rating Form	4	.83
Descriptive Norms Questions	3	.63
Coping Drinking Motives	5	.94
Conformity Drinking Motives	5	.79
Enhancement Drinking Motives	5	.90
Social Drinking Motives	5	.90
Enhancement Drinking Motives	3	.80
Enhancement Drinking Motives	24	.88

Note. AUDIT-C = Alcohol Use Disorder Identification Test—Consumption; BYAACQ = Brief Young Adult Alcohol Consequences Questionnaire.

Participants

Pilot study participants were recruited from two undergraduate classes in the Counseling and Educational Development Department. Participants were eligible if they were between the ages 18-24 years old and currently enrolled as a full-time student. Full-time enrollment status was defined as being enrolled in at least 12 credit hours during the semester. I read a prepared script and administered survey packets and pilot study feedback forms at the beginning of each class. Students who agreed to participate completed the survey and pilot study feedback form and returned it to the researcher sealed in a manila envelope.

Twenty-three students were recruited to participate in the pilot study. Total number of students recruited from each class was 13 and 10, respectively. The majority of participants were female ($n = 19$, 82.6%) and all participants were registered as full-time students. Most participants were Caucasian ($n = 10$, 43.5%) or African-American ($n = 9$, 39.1%). Nearly one third of participants were first year students ($n = 7$, 30.4%) between the ages of 18 and 24, with a mean age of 19.9 ($SD = 1.75$). Most participants lived on campus in university housing ($n = 13$, 56.5%) or in off campus housing ($n = 5$, 21.7%) without their parent/guardian. The grade point average of a "B" was reported by most participants ($n = 18$, 78.3%) and the majority of participants reported no involvement in either varsity athletics ($n = 19$, 82.6%) or club sports ($n = 18$, 78.3%). Because the option to respond "no" was omitted from the survey packet, incomplete data was collected regarding involvement in intermural sports. No participants reported involvement in Greek life. Several participants were first generation college students, in

that the highest level of formal education attained by their parents was high school ($n = 6$, 26.1%). Demographic data for the pilot study participants are presented in Table 3.

Table 3

Demographics of Pilot Study Participants

Demographic Characteristic	*n*	%
SEX		
Male	4	17.4
Female	19	82.6
TOTAL	23	100.0
ETHNICITY		
Caucasian	10	43.5
Black/African American/Caribbean	9	39.1
Hispanic or Latino/a	3	13.0
Biracial or Multiracial	1	4.3
TOTAL	23	100.0
CLASS YEAR		
1st Year Undergraduate	7	30.4
2nd Year Undergraduate	7	30.4
3rd Year Undergraduate	5	21.7
4th Year Undergraduate	1	4.3
5th Year Undergraduate	2	8.7
Other	1	4.3
TOTAL	23	100.0
AGE		
18	6	26.1
19	6	26.1
20	3	13.0
21	2	8.7
22	5	21.7
24	1	4.3
TOTAL	23	100.0

Table 3 (cont.)

Demographic Characteristic	*n*	%
CURRENT RESIDENCE		
Campus Residence Hall	13	56.5
Other College/University Housing	2	8.7
Parent/Guardian's Home	2	8.7
Other Off-Campus Housing	5	21.7
Other	1	4.3
TOTAL	23	100.0
VARSITY ATHLETICS INVOLVEMENT		
Yes	4	17.4
No	19	82.6
TOTAL	23	100.0
CLUB SPORTS INVOLVEMENT		
Yes	2	8.7
No	21	91.3
TOTAL	23	100.0
INTERMURAL SPORTS INVOLVEMENT[*]		
Yes	1	50.0
No	1	50.0
TOTAL	2	100.0
VARSITY ATHLETICS INVOLVEMENT		
Yes	4	17.4
No	19	82.6
TOTAL	23	100.0
ESTIMATED GPA		
A	2	8.7
B	18	78.3
C	2	8.7
N/A	1	4.3
TOTAL	23	100.0

Table 3 (cont.)

Demographic Characteristic	*n*	%
FIRST GENERATION COLLEGE STUDENT		
Yes	4	17.4
No	19	82.6
TOTAL	23	100.0

Note. *The response optional "No" was mistakenly omitted from the survey packet.

Drinking history demographics also were calculated. Most participants reported consuming alcohol within the past 30 days (*n* = 15, 71.4%) and only one participant reported no use during the past year (4.8%). Two participants did not respond to the question that assessed past year alcohol use. Responses to the AUDIT-C indicate that most participants typically consume between 1-2 drinks per occasion (*n* = 14, 63.6%) and drink alcohol 2-4 times a month or more (*n* = 13, 59.1%). Nearly half of the sample reported engaging in heavy episodic drinking monthly or weekly (*n* = 10, 45.4%). The majority of participants reported that they had not been cited for alcohol use by police or campus authorities (*n* = 21, 91.3%). Age of first use (beyond just a sip) ranged from 10-11 (*n* = 1, 4.3%) to 21-25 (*n* = 2, 8.7%) years of age. The most frequently reported age range of drinking onset was 16-17 (*n* = 9, 39.1%). A complete list of alcohol use-related descriptive data on the pilot study participants is presented in Table 4.

Table 4

Alcohol Use-Related Demographic Information

Drinking Descriptive	*n*	%
PAST YEAR ALCOHOL USE[*]		
Yes, Within Past 30 Days	15	71.4
Yes, Not Within Past 30 Days	5	23.8
No Alcohol Use in Past Year	1	4.8
TOTAL	21	100.0
AGE OF FIRST USE		
10-11	1	4.3
12-13	1	4.3
14-15	2	8.7
16-17	9	39.1
18-20	6	26.1
21-25	2	8.7
Did Not Use	2	8.7
TOTAL	23	100.0
ALCOHOL USE FREQUENCY[**]		
Never	4	18.2
Monthly or Less	5	22.7
2-4 Times a Month	9	40.9
2-3 Times a Week	2	9.1
4 or More Times a Week	2	9.1
TOTAL	22	100.0
ALCOHOL CITATION PAST YEAR		
Yes	2	8.7
No	21	91.3
TOTAL	23	100.0
ALCOHOL USE TYPICAL DAY[**]		
1 or 2	14	63.6
3 or 4	5	22.7
5 or 6	1	4.5
7 to 9	1	4.5
10 or more	1	4.5
TOTAL	22	100.0

Table 4 (cont.)

Drinking Descriptive	n	%
HEAVY EPISODIC DRINKING FREQUENCY[**]		
Never	6	27.3
Less than Monthly	6	27.3
Monthly	7	31.8
Weekly	3	13.6
Daily or Almost Daily	0	0.0
TOTAL	22	100.0

Note. *Two participants did not complete this question. **One participant did not complete these items

Procedures

To recruit participants, I contacted two course instructors of undergraduate courses in the Department of Counseling and Educational Development in a mid-sized public university for participation in the study. Once permission from the instructors was obtained, I visited each class on a date selected by the instructor to invite students to participate. To decrease the odds that participants would respond in a socially desirable manner, I received a waiver of signed informed consent from the IRB so that no identifying information would be collected during the survey administration.

I provided a verbal presentation that explained the purpose of the study and described the voluntary and confidential nature of participation. I then distributed an informed consent form that described the nature of the study, any potential risks, the confidential nature of the study, and which contained a list of substance abuse and psychological counseling resources on campus. Participants were allowed to withdraw from the study at any time, without repercussion. I distributed the survey packet that

included 107 items along with the pilot study feedback form. When participants were finished, they secured their survey packet and pilot study feedback form in a manila envelope and placed this envelope in a cardboard box carried around the classroom by the researcher. These procedures are intended to alleviate any concern among participants that their survey packet may be traced back to them. No incentives were provided to students who participated.

Data Analyses

Several analyses were conducted in an effort to evaluate the feasibility of this research and explore preliminary associations between variables. Descriptive statistics were calculated to determine the mean and standard deviation of each variable included in the proposal model. Bivariate Pearson Product correlations and reliability statistics (Table 1) were calculated to examine associations between each variable and to provide preliminary evidence in support of the proposed hypotheses for the full study.

Results

The 23 participants who were involved in the pilot study completed the 107-item survey packet and pilot study feedback form, although items on the several of the measures included in the survey packet were left blank by several participants. In particular, four participants failed to complete items that comprise the CEOAQ (Negative) subscale, two participants left questions unanswered on the CEOAQ (Positive) subscale, and one participant failed to complete items on both DMM-R (Enhancement) subscale and AUDIT-C. Several comments made on the pilot study

feedback form noted that the format of the CEOAQ made it difficult to read and respond to the items.

In order to examine the exogenous and endogenous variables included in the hypothesized model, a table of means and standard deviations was calculated. The mean score for the 22 pilot (one participant was dropped due to incomplete data) study participants on the AUDIT-C was 3.64 (SD = 2.78). This score was less than the mean score on the descriptive norms subscale (5.39, SD = 2.10), which represented perceived alcohol use intensity by peers of the same gender. For the BYAACQ, the mean score for the 23 pilot study participants was 5.78 (SD = 4.89). Among drinking motives, social reinforcement motives had the highest average score with a mean of 3.18 (SD = 1.25). Positive alcohol outcome expectancies (CEOAQ Positive) had a marginally higher mean score compared to negative alcohol outcome expectancies, 2.79 (SD = .53) and 2.42 (SD = .59). The means and standard deviations of variables included in the model are displayed in Table 5.

Pearson product moment correlations were run to assess relationships among the key variables in the study. Results of the correlation matrix provided preliminary support for several of the hypothesized direct associations described in the hypothesized model of the full study. In regards to Hypothesis 2, positive correlations were observed between conformity motives and both descriptive (r = .559, p < .01) and injunctive norms (r = .376, p < .10). Social motives were found to be correlated positively with injunctive norms (r = .422, p < .05); however, the association between social motives and descriptive norms was not significant at p < .10 (r = .324, p < .132).

Table 5

Descriptive Statistics for Variables Included in the Hypothesized Path Model

Instrument/Subscale	*M*	*SD*	*N*
Positive Outcome Expectancies	2.79	0.53	21
Negative Outcome Expectancies	2.42	0.59	19
Injunctive Norms Rating Form	2.16	1.09	23
Descriptive Norms Questions	5.39	4.88	23
Coping Drinking Motives	1.82	1.16	23
Conformity Drinking Motives	1.46	0.62	23
Enhancement Drinking Motives	2.40	1.17	22
Social Drinking Motives	3.18	1.25	23
AUDIT-C	3.64	2.78	22
BYAACQ	5.78	4.89	23

Note. AUDIT-C = Alcohol Use Disorder Identification Test—Consumption; BYAACQ = Brief Young Adult Alcohol Consequences Questionnaire.

Internal motives (coping and conformity) were positively correlated with both alcohol outcome expectancies (negative and positive), in support of Hypothesis 3. Each of these correlations were found to be statistically significant at the $p < .05$ level, except for coping motives and negative alcohol outcome expectancies, which was significant at $p < .10$ ($r = .406$, $p < .10$). In regards to Hypothesis 4, alcohol use intensity (as measured by the AUDIT-C) was positively correlated with both positive motives, social reinforcement ($r = .608$, $p < .01$) and enhancement ($r = .708$, $p < .01$). Finally, alcohol-related negative consequences (as measured by the BYAACQ) was found to have a positive correlation with both negative motives, coping ($r = .398$, $p < .10$) and conformity ($r = .468$, $p < .05$). The full correlation matrix is presented in Table 6.

Table 6

Correlation Matrix of Exogenous and Endogenous Variables

	Pos	Neg	INRQ	DNS	Cope	Confrm	EDM	SRDM	AUI	BYCQ
Pos	1.00									
Neg	.52**	1.00								
INRQ	.12	-.03	1.00							
DNS	.28	-.08	.40***	1.00						
Cope	.53**	.41***	-.07	.33	1.00					
Confrm	.43***	-.15	.38***	.60*	.51**	1.00				
EDM	.58*	.64*	.22	.30	.70*	.31	1.00			
SRDM	.66*	.38	.42**	.32	.48**	.46**	.84*	1.00		
AUI	.41	.25	.74*	.51**	.29	.27	.71*	.61*	1.00	
BYCQ	.49**	.32	.69*	.46**	.40***	.47**	.68*	.63*	.83*	1.00

Note. *$p < .01$ (2-tailed); **$p < .05$ (2-tailed); ***$p < .10$ (2-tailed). Pos = Positive Alcohol Outcome Expectancies; Neg = Negative Alcohol Outcome Expectancies; INRQ = Injunctive Norms Rating Questionnaire; DNS = Descriptive Norms Scale - Revised; Cope = Coping Drinking Motives Scale; Confrm = Conformity Drinking Motives Scale (Log 10); Enhance = Enhancement Drinking Motives; Social = Social Reinforcement Drinking Motives; AUI = Alcohol Use Intensity; BYCQ = Brief Young Adult Alcohol Consequences Questionnaire.

Twenty-one of 23 pilot study participants completed the pilot study feedback form. Twelve participants reported that it took 10 minutes to complete the survey packet. The shortest completion time was six minutes and the longest it took a participant to complete the survey packet was 15 minutes, with an average completion time of 10.19 minutes. All pilot study participants who completed the pilot study feedback form responded "yes" to the question that asked if the questions and instructions were clear and easy to follow. Two participants reported that they had difficulty completing the CEOAQ because the rows were spaced too close together. Analysis of missing data also

suggests that the item assessing past year alcohol use may have been overlooked by some participants because of its location in the survey packet.

Discussion

The pilot study allowed the researcher to test procedures and measures as well as to examine preliminary relationships among exogenous and endogenous variables to inform the main study. Twenty-three participants, representing a wide range of class years, ethnicities, and ages, participated in the pilot study. Nearly all participants ($n = 20$, 95.2%) consumed alcohol within the past year and the majority of these participants ($n = 15$, 71.4%) reported alcohol consumption within the past 30 days. The proportion of drinkers in the pilot study sample lends support for the feasibility of the main study, which will only utilize data collected from participants who report alcohol consumption with the past year. The results of the pilot study provided several other key findings that enhanced the main study.

Based on responses to the pilot study feedback form and the success of the researcher to recruit eligible participants, no changes to the study procedures were made. Coordinating with the instructor to recruit participants during the beginning of class likely was a factor in the high response rate. Further, obtaining a signed waiver of consent and asking participants to place their survey packet in an unmarked manila envelope may have decreased the chances that participants responded in a socially desirable manner.

The average time taken by pilot study participants to finish the survey packet was approximately 10 minutes. This amount of time was significantly less than the 25 minutes

listed in the Informed Consent Form. Indeed, the longest reported time of completion was

10 minutes less than the time anticipated by the researcher that it would take to finish the

survey. In response to these unexpected findings, I revised the recruitment script

(Appendix B) and invitation to instructors as well as the Informed Consent Form for the

main study to indicate that the survey packet will take approximately 10-15 minutes to

complete. This unexpected finding is an advantage, because the survey packet takes up

less class time instructors may be more willing to allow the researcher to collect data in

their class.

The results of the pilot study indicated that several changes need to be made to the

survey packet. First, the "No" response option for the demographic question assessing

involvement in club sports was mistakenly omitted from the survey packet. This item

was corrected for the main study. Second, based on two comments made on the pilot

study feedback form as well as observations made by the researcher when entering the

data, the present format of the CEOAQ increased the difficulty in responding. To

improve the clarity and accessibility of this instrument, gridlines were included and the

height of each row was increased. Further, the demographics question measuring past

year alcohol use was not completed by two participants. The failure to complete this item

is curious because these participants responded to every other item in the survey packet.

Based on his review of the instrument, I believe that it is likely that item was not

answered because it is located at the bottom of page three underneath a large grid box. To

increase the likelihood that participants in the main study will notice this item, I increased

the font size of this question and placed it in the middle of the page.

Although the sample size of 23 participants limited the analyses to correlations among the variables, findings from the pilot study lend support for the research questions and hypotheses in the main study. All significant relationships observed among variables included in the main study were correlated in the direction hypothesized by the researcher. Further, several statistically significant associations identified offer support for the research questions and hypotheses in the main study that investigate direct and indirect relationships between the variables. For instance, the statistically significant direct positive associations found between negative drinking motives and alcohol-related negative consequences, combined with the non-significant relationships between negative motives and alcohol use intensity, lend support for the proposed path model (i.e., Research Question 5).

Several limitations must be considered when considering the findings of the pilot study. Because of the small sample size and exploratory nature of this study, a liberal p value of .10 was utilized to determine significance, increasing the likelihood of type I errors. Additionally, several un-hypothesized relationships among exogenous variables were found. Positive alcohol outcome expectancies were significantly associated with social reinforcement drinking motives ($r = .656$, $p < .01$). These findings may be an artifact of the sample; however, this association may indicate that beliefs about the expected positive chemical effects of alcohol may be related to motivation to consume alcohol for its instrumental effects. Although relationships between the antecedents of intrinsic and extrinsic motives are accounted for in the proposal model (all four exogenous variables are allowed to correlate with each other), a direct association

between cognitive influences and extrinsic drinking motives may weaken the overall fit of the path model.

Similarly, several hypothesized relationships that were not observed in the correlation matrix may indicate possible limitations of the main study. Negative alcohol outcome expectancies were not related to conformity motives ($r = -.145$, $p < .55$), alcohol use intensity ($r = .251$, $p < .29$), or alcohol-related negative consequences ($r = .316$, $p < .19$). This finding was unexpected given that past research has found negative alcohol outcome expectancies to be positively associated with conformity motives (Urbán, Kökönyei, & Demetrovics, 2008) and predictive of both problem drinking and alcohol-related negative consequences (Hasking et al., 2011). A second association that was not found to be statistically significant in the pilot study was the relationship between descriptive norms and social drinking motives ($r = .324$, $p < .13$). The failure to observe these hypothesized relationships will be addressed in the main study by utilizing a larger sample size that will provide analyses with adequate power to determine significance.

One potential limitation for the main study based on pilot study results are the large correlations among alcohol use intensity and alcohol-related negative consequences ($r = .823$, $p < .01$) as well as between social reinforcement drinking motives and enhancement motives ($r = .843$, $p < .01$). These high correlations raise the risk of multicollinearity among the variables. Although the larger sample size for the main study may reduce the potential of multicollinearity, this possibility remains a concern because non-orthogonal variables increase the standard errors of the path coefficients and decreases the likelihood of observing statistically significant relationships among the

variables. To address this concern, all variables in the main study were examined for multicollinearity as well as for other multivariate assumptions. Appropriate steps and transformations of the data will be taken if preliminary tests of assumptions are not met.

Summary

The pilot study provided critical information regarding changes that were made to the instrumentation of the main study. First, formatting changes were made to the CEOAQ and past year drinking demographics question to increase the clarity and visibility of these items. Additionally, an item with a missing response option was revised in the demographics section of the survey packet to ensure that participants are able to report involvement in club sports. Finally, study materials (e.g., Informed Consent Form, recruitment script) were revised to reflect the approximate timeframe needed for pilot study participants to complete the survey packet.

CHAPTER IV

RESULTS

In Chapter I, the study was introduced with a focus on the purpose of the research. A review of the literature on perceived norms, alcohol outcome expectancies, drinking motives, alcohol use intensity, and alcohol-related negative consequences is in Chapter II. In Chapter III, the methodology used in the current study was described including the research questions, hypotheses, survey instruments, and data analyses. The results of the analyses conducted to test the study hypotheses are detailed in this chapter. First, a description of the sample is outlined ranging from general demographic characteristics to information on specific drinking behaviors. Descriptive statistics on the measures used for the study are discussed. Outcomes from each hypothesis test are presented. A summary of the findings is provided at the end of the chapter.

Description of Participants

Convenience sampling was used to recruit participants for this study. I recruited participants from 22 classrooms across 5 departments on campus over a three week period. Departments visited to recruit participants included Counseling and Educational Development ($n = 7$), Public Health Education ($n = 7$), Kinesiology ($n = 3$), Communication Studies ($n = 3$), and Sociology ($n = 2$). A total of 535 completed surveys were obtained during this period, 445 of which were utilized in this study. Among those ineligible for this study, 85 participants (16%) reported abstaining from alcohol

consumption during the past year, four participants reported that they were not undergraduates (i.e., graduate level), and one participant exceeded the maximum age parameter (18-24) for inclusion in the study.

As described in Table 7, the age of participants ranged from 18 to 24 years old and the average age of study participants was 20.49 ($SD = 1.45$). The majority of participants were female ($n = 302$, 67.9%) and Caucasian ($n = 236$, 53.0%). Most participants were in their third ($n = 150$, 33.7%) or fourth ($n = 121$, 27.2%) year of college and all study participants reported full time status (i.e., currently enrolled in 12 or more semester credit hours; $N = 445$, 100%). Off campus housing was the most commonly reported residence ($n = 214$, 48.2%) among participants followed by on campus housing ($n = 181$, 40.8%). A small number of participants reported involvement in Greek life ($n = 38$, 8.6%), and similarly, a small proportion were involved in varsity athletics ($n = 34$, 7.6%) and club sports ($n = 42$, 9.4%). Nearly one in five participants reported participation in intramurals ($n = 88$, 19.9%). The majority of participants reported an approximate grade point average of a B ($n = 237$, 53.3%), and only a small number reported that they were the first in their family to attend college ($n = 39$, 8.8%).

Table 7

Demographics of Study Participants ($N = 445$)

Demographic Characteristic	n	%
SEX		
Male	143	32.1
Female	302	67.9
TOTAL	445	100.0

Table 7 (cont.)

Demographic Characteristic	*n*	%
ETHNICITY		
Caucasian	236	53.0
Black/African American/Caribbean	136	30.6
Asian or Pacific Islander	25	5.6
Hispanic or Latino/a	18	4.0
American Indian, Alaska Native	2	0.4
Biracial or Multiracial	25	5.6
Other	3	0.7
TOTAL	445	100.0
CLASS YEAR		
1st Year Undergraduate	77	17.3
2nd Year Undergraduate	69	15.5
3rd Year Undergraduate	150	33.7
4th Year Undergraduate	121	27.2
5th Year Undergraduate	28	6.3
TOTAL	445	100.0
AGE		
18	43	9.7
19	66	14.8
20	105	23.6
21	132	29.7
22	57	12.8
23	20	4.5
24	15	3.4
MISSING	7	1.6
TOTAL	445	100.0
CURRENT RESIDENCE		
Campus Residence Hall	134	30.1
Residential College/Learning Community	13	2.9
Fraternity/Sorority Housing	4	0.9
Other College/University Housing	30	6.7
Parent/Guardian's Home	48	10.8
Other Off-Campus Housing	215	48.3
MISSING	1	0.2
TOTAL	445	100.0

Table 7 (cont.)

Demographic Characteristic	*n*	%
GREEK LIFE INVOLVEMENT		
Yes	38	8.5
No	404	90.8
MISSING	3	0.7
TOTAL	445	100.0
VARSITY ATHLETICS INVOLVEMENT		
Yes	34	7.6
No	406	91.2
MISSING	5	1.1
TOTAL	445	100.0
CLUB SPORTS INVOLVEMENT		
Yes	42	9.4
No	399	89.7
MISSING	4	0.9
TOTAL	445	100.0
INTERMURAL SPORTS INVOLVEMENT		
Yes	88	19.8
No	355	79.8
MISSING	2	0.4
TOTAL	445	100.0
APPROXIMATE GPA		
A	99	22.2
B	237	53.3
C	99	22.2
D/F	5	1.1
N/A	3	0.7
MISSING	2	0.4
TOTAL	445	100.0
FIRST GENERATION COLLEGE STUDENT		
Yes	39	8.8
No	404	90.8
MISSING	2	0.4
TOTAL	445	100.0

Drinking-related demographic characteristics also were calculated for the sample. Most participants in the research sample reported consuming alcohol for the first time (beyond just a sip) before the age of 18 ($n = 257$, 57.8%). A majority of participants reported having at least one family member who has had a drug or alcohol problem ($n = 246$, 55.3%). A small number of participants reported that they had been cited by police or campus authorities for alcohol consumption during the past year ($n = 22$, 4.9%). Over 1-in-4 participants ($n = 347$, 78.0%) reported alcohol use within the past thirty days of completing the survey. Among these participants, 43.4% ($n = 193$) engaged in at least one occasion of heavy episodic drinking during the past two weeks. For this item, heavy episodic was defined as consuming five or more drinks in a sitting, a definition used by the Core Alcohol and Drug Survey (Core Institute, 2012) and the National College Health Assessment (ACHA, 2012), in order to compare the research sample with national collegiate drinking norms.

Hazardous drinking status also was assessed in the research sample. According to DeMartini and Carey (2012), an optimal cut-off score on the AUDIT-C to screen for at-risk drinking among undergraduates was 5 for females and 7 for males. These authors defined at-risk drinking for male students as having consumed 14 or more drinks in a typical week or reported at least four heavy drinking episodes in the past month and, for female students, consuming seven or more drinks in a typical week or reported at least four heavy drinking episodes in the past month (2012). Based on these scoring guidelines, nearly one third ($n = 144$, 32.4%) of the sample met the criteria for hazardous

drinking. A detailed list of alcohol use-related demographic information for study

participants is presented in Table 8.

Table 8

Alcohol Use-Related Demographic Information

Drinking Descriptive	*n*	%
PAST YEAR ALCOHOL USE		
Yes, Within Past 30 Days	347	78.0
Yes, Not Within Past 30 Days	98	22.0
TOTAL	445	100.0
AGE OF FIRST USE		
Under 10	2	0.4
10-11	4	0.9
12-13	23	5.2
14-15	79	17.8
16-17	147	33.0
18-20	161	36.2
21-25	26	5.8
MISSING	3	0.7
TOTAL	445	100.0
HEAVY EPISODIC DRINKING DURING PAST TWO WEEKS		
None	251	56.4
Once	95	21.3
Twice	50	11.2
3 to 5 Times	38	8.5
6 to 9 Times	9	2.0
10 or More Times	1	0.2
MISSING	1	0.2
TOTAL	445	100.0
AUDIT-C HAZARDOUS DRINKING[*]		
Meets Criteria	144	32.4
Does Not Meet Criteria	301	67.6
TOTAL	445	100.0

Table 8 (cont.)

Drinking Descriptive	*n*	%
NUMBER OF FAMILY MEMBERS WITH ALCOHOL OR DRUG PROBLEM		
0	187	42.0
1	129	29.0
2	64	14.4
3	37	8.3
4	11	2.5
5	4	0.9
6	1	0.2
MISSING	12	2.7
TOTAL	445	100.0
ALCOHOL CITATION PAST YEAR		
Yes	22	4.9
No	419	94.2
MISSING	4	0.9
TOTAL	445	100.0

Note. *Hazardous drinking criteria was defined as a score of 5 or higher for female students and 7 or higher for male students on the AUDIT-C. AUDIT-C = Alcohol Use Disorder Identification Test—Consumption.

Representativeness of the Sample

The ratio of male (32.1%) and female (67.9%) participants in the sample was comparable to the ratio of the University at which the data was gathered (65% female; 35% male). African American students in the sample (30.6%) were slightly overrepresented compared to the proportion of African American undergraduates enrolled at the University (25%). Further, the overall percentage of non-Caucasian participants (47.0%), including students who identified as African-American, Asian, Hispanic, and multi-racial, exceeded the total University minority enrollment (37%). The average age of students in the sample was 20.49 ($SD = 1.45$), which is 1.51 years younger

than the average age of full-time undergraduates enrolled at the University. Although no direct method was included to assess for student academic major, recruitment for the study was conducted in courses that represented numerous disciplines across the University and included courses that are required for all undergraduates, thereby increasing the likelihood that a variety of academic majors and programs were represented in the sample.

The National College Health Assessment (NCHA; ACHA, 2012) Survey revealed that, among those who reported drinking within the past year, 83% of students surveyed in spring 2012 consumed alcohol within the past 30 days. Within the current sample, approximately 78.0% of participants reported alcohol consumption during the past thirty days. Despite the differences in past thirty-day alcohol use, the percentage of students in the current sample who have used alcohol within the past year and engaged in heavy episodic drinking during the past two weeks (43.4%) is consistent with the national average (41.2%; ACHA, 2012). Although these percentages between the current sample and a national representative sample are not identical, they are in similar ranges, suggesting that the study sample was comparable in some respects to American college students in general.

Descriptive Statistics of the Instruments Used in the Study

The measures utilized in the study included the Comprehensive Effects of Alcohol Questionnaire (CEOAQ; Fromme et al., 1993), Drinking Motives Measure-Revised (DMM-R; Cooper, 1994), Alcohol Use Disorder Identification Test-Consumption (AUDIT-C; Babor et al., 2001), Brief Young Adult Alcohol Consequences

Questionnaire (BYAACQ; Kahler et al., 2005), Injunctive Norms Rating Questionnaire

(Baer, 1994), and three items that assessed same-sex typical student descriptive norms

from the Alcohol and Other Drug Survey (Thombs, 1999). The CEOAQ included two

separate scales measuring positive and negative alcohol outcome expectancies. The

DMM-R included four scales assessing social reinforcement, enhancement, conformity,

and coping drinking motives. The AUDIT-C was used as a measure of alcohol use

intensity, whereas the BYAACQ was used to assess alcohol-related negative

consequences within the research sample. The complete survey packet, including

demographic items, can be in found in Appendix D.

Means and standard deviations were calculated for the sample. Means scores of

positive and negative alcohol outcome expectancies were 2.83 ($SD = 0.54$) and 2.45 (SD

$= 0.51$), respectively. The mean score of the injunctive norms rating form was 2.27 ($SD =$

0.87), whereas the mean score of the descriptive norms scale was 6.01 ($SD = 1.89$).

Among drinking motives, the highest reported mean score was social reinforcement ($M =$

3.14, $SD = 1.04$), followed by enhancement ($M = 2.60$, $SD = 1.03$), coping ($M = 1.90$, SD

$= 0.90$), and conformity ($M = 1.48$, $SD = 1.48$). The mean score of alcohol use intensity

was 4.13 ($SD = 2.39$) with scores ranging from a minimum of zero to a maximum of ten.

The mean score of the BYAACQ was 6.39 ($SD = 4.89$) with observed scores within the

research sample ranging from a minimum of zero to a maximum of 21. Descriptive

statistics, including observed range and possible range, for the scales are depicted in

Table 9.

Table 9

Descriptive Statistics for Participants

Instruments and Subscales	*M* (*SD*)	Possible Range	Observed Range
Positive Outcome Expectancies	2.83 (0.54)	1– 4	1– 4
Negative Outcome Expectancies	2.45 (0.51)	1– 4	1– 4
Injunctive Norms	2.27 (0.87)	1– 7	1– 6
Descriptive Norms	6.01 (1.89)	0– 12	1– 11
Coping Drinking Motives	1.90 (0.90)	1– 5	1 – 5
Conformity Drinking Motives	1.48 (1.48)	1– 5	1 – 5
Enhancement Drinking Motives	2.60 (1.03)	1– 5	1 – 5
Social Drinking Motives	3.14 (1.04)	1– 5	1 – 5
AUDIT-C	4.13 (2.39)	0– 12	0 – 10
BYAACQ	6.39 (4.89)	0– 24	0– 21

Note. BYAACQ = Brief Young Adult Alcohol Consequences Questionnaire; AUDIT-C = Alcohol Use Disorders Identification Test—Consumption.

Reliability Statistics for the Instruments Used in the Study

The internal consistency of each instrument used in the research study was calculated and is presented in Table 10. The DDM-R demonstrated good reliability with the Cronbach's alpha for the four drinking motives ranging from.84 to.87.The drinking outcome variables, alcohol use intensity and BYAACQ, possessed acceptable to good internal consistency with reliability coefficients of .78 and .89, respectively. Positive (α = .91) and negative (α = .87) alcohol outcome expectancy scales on the CEOAQ demonstrated good to excellent internal consistency. Reliability coefficients for the

Injunctive Norms Rating Form (α = .65) and descriptive norms measure (α = .62) were

questionable.

Table 10

Reliability Coefficients for Instruments Used in the Study

Instruments and Subscales	Number of Items	Alpha Coefficient
Positive Outcome Expectancies	20	.91
Negative Outcome Expectancies	18	.87
Injunctive Norms	4	.65
Descriptive Norms	3	.62
Coping Drinking Motives	5	.86
Conformity Drinking Motives	5	.84
Enhancement Drinking Motives	5	.87
Social Drinking Motives	5	.87
AUDIT-C	3	.78
BYAACQ	24	.88

Note. BYAACQ = Brief Young Adult Alcohol Consequences Questionnaire; AUDIT-C = Alcohol Use Disorders Identification Test—Consumption.

Reliability analyses were conducted to explore possible solutions for improving

internal consistency for the Injunctive Norms Rating Form and the descriptive norms

measure. Analysis of the Injunctive Norms Rating Form did not reveal a solution for

increasing the reliability coefficient of the scale by excluding items. Item-total statistics

for the descriptive norms scale indicated that excluding the item assessing quantity of

consumption (*How many drinks containing alcohol do you think a typical student of the

same sex at your university has on a typical day when drinking?*) increased the reliability

coefficient from .62 to .68. I chose to exclude this item because the descriptive norms

measure possesses two questions that assess quantity of use, which allows for the

removal of this item without compromising the validity of the instrument. Further, the

revised two-item instrument possesses a reliability coefficient that is closer to the

acceptable level identified by Kelloway (1998) as suitable for use in Path Analysis (.70).

Descriptive statistics and alphas for the original and revised descriptive norms measure

are presented in Table 11.

Table 11

Descriptive Statistics and Alphas for Original and Revised Descriptive Norms Scale

Instruments and Subscales	M (SD)	Possible Range	Observed Range	Alpha Level
Descriptive Norms	6.01 (1.89)	0 – 12	1 – 11.00	.62
Descriptive Norms – Revised	4.84 (1.30)	0 – 8	1 – 8	.68

Assessing Normality of the Variables in the Research Sample

In order to evaluate assumptions of normality, skewness and kurtosis statistics

were calculated. Statistics for all exogenous and endogenous variables, except for

conformity motives, were within acceptable range (e.g., $\leq$ +/-1). Normality statistics

indicated that conformity motives possessed a leptokurtic distribution that is positively

skewed with most scores concentrated on left of the mean. Because a key assumption of

Path Analysis is that the data adheres to a mesokurtic distribution (i.e., normal; Kline,

2010), a log 10 transformation was used to better approximate a normal distribution for

the variable. The skew and kurtosis of this transformed variable were improved and

within acceptable range. Skewness and kurtosis statistics as well as the number of

participants who completed each instrument are presented in Table 12.

Table 12

Skewness and Kurtosis Statistics for Instruments and Subscales

Instruments and Subscales	n	Skewness Statistic	Kurtosis Statistic
Positive Outcome Expectancies	421	-0.58	0.54
Negative Outcome Expectancies	426	-0.19	0.28
Injunctive Norms	444	0.68	0.43
Descriptive Norms (Revised)	444	-0.30	-0.15
Coping Drinking Motives	442	1.21	1.15
Conformity Drinking Motives	445	2.17	5.60
Conformity Motives (Log 10)	445	1.17	0.81
Enhancement Drinking Motives	442	0.18	-0.88
Social Drinking Motives	442	-0.19	-0.85
AUDIT-C	445	0.36	-0.59
BYAACQ	445	0.74	0.04

Note. n = number of participants who completed the instrument or subscale. Conformity Motives (Log10) represents log transformed variable.

Results of Hypothesis Testing

The following sections outline the statistical results of the hypothesis tests that

were conducted for this study. The analyses used to test the 12 hypotheses are path

analysis, non-parametric bootstrapping, and multigroup tests of invariance.

Hypothesis One: Model Fit

Hypothesis one stated that the hypothesized model will be a satisfactory fit for the data. To assess this hypothesis, Pearson product moment correlations were calculated for the four exogenous variables and six endogenous variables included in the model. An analysis of the correlation matrix of study variables, depicted in Table 13, reveals significant associations among exogenous and endogenous variables. Several of these significant correlations provided support for the hypothesized model, including associations between alcohol use intensity and alcohol-related negative consequences ($r = .57$, $p < .01$), positive drinking motives and alcohol use intensity (social, $r = .44$, $p < .01$; enhancement, $r = .51$, $p < .01$), negative drinking motives and alcohol-related negative consequences (coping, $r = .40$, $p < .01$; conformity, $r = .28$, $p < .01$), and positive alcohol outcome expectancies and internal motives (coping, $r = .43$; $p < .01$; enhancement, $r = .59$, $p < .01$). Support also was found for the associations between social drinking motives and social norms variables (injunctive, $r = .35$, $p < .01$; descriptive, $r = .23$, $p < .01$) as well as negative alcohol outcome expectancies and internal drinking motives (coping, $r = .34$; $p < .01$; enhancement, $r = .18$, $p < 0.01$). Differing from the hypothesized model was the non-significant relationships between conformity motives and social norms variables (injunctive, $r = -.02$; descriptive, $r = .03$). Further, the most robust association among study variables was social drinking motives and enhancement drinking motives ($r = .72$; $p < .01$). This unhypothesized relationship may indicate that these variables are non-orthogonal and have a negative effect on the fit of the model.

Table 13

Correlation Matrix of Exogenous and Endogenous Variables

	Pos	Neg	INRQ	DNS	Cope	Confrm	EDM	SRDM	AUI	BYCQ
Pos	1.00									
Neg	.35*	1.00								
INRQ	.25*	-.02	1.00							
DNS	.16*	-.02	.25*	1.00						
Cope	.43*	.34*	.19*	.07	1.00					
Confrm	.17*	.22*	-.02	.03	.39*	1.00				
EDM	.59*	.18*	.33*	.16*	.54*	.30	1.00			
SRDM	.58*	.21*	.35*	.23*	.53*	.37*	.72*	1.00		
AUI	.36*	.01	.56*	.32*	.24*	.03	.51*	.44*	1.00	
BYCQ	.39*	.24*	.35*	.18*	.40*	.28*	.50*	.47*	.57*	1.00

Note. *$p < .01$ (2-tailed). Pos = Positive Alcohol Outcome Expectancies; Neg = Negative Alcohol Outcome Expectancies; INRQ = Injunctive Norms Rating Questionnaire; DNS = Descriptive Norms Scale—Revised; Cope = Coping Drinking Motives Scale; Confrm = Conformity Drinking Motives Scale (Log 10); EDM = Enhancement Drinking Motives; SRDM = Social Reinforcement Drinking Motives; AUI = Alcohol Use Intensity; BYCQ = Brief Young Adult Alcohol Consequences Questionnaire.

A covariance matrix was calculated using the correlation matrix and the standard deviations of each variable. This matrix, along with hypothesized model specifications, were then entered into LISREL Volume 8.80 Student Edition computer software program in order to generate the hypothesized path model. The specified model with standardized path coefficients is presented in Figure 4.
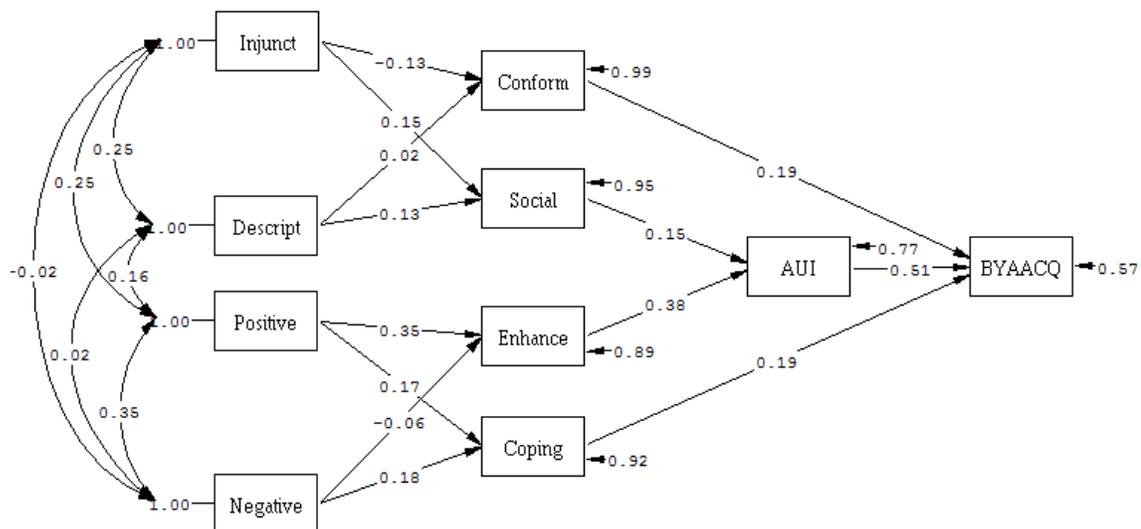
Injunct = Injunctive Norms; Descript = Descriptive Norms; Positive = Positive Alcohol Outcome Expectancies; Negative = Negative Alcohol Outcome Expectancies; Conform = Conformity Motives, Social = Social Reinforcement Motives; Enhance = Enhancement Motives; Coping = Coping Motives; AUI = Alcohol Use Intensity; BYAACQ = Brief Young Adult Alcohol Consequences Questionnaire. For visual ease, the correlated errors between drinking motives are not shown in the above diagram.

Figure 4. Standardized solution of hypothesized model ($N = 445$).

Evaluation of the global fit statistics revealed that the hypothesized model was a poor fit for the data. More specifically, $\chi^2 = 3216.79$ ($df = 20$, $p = .00$) was statistically significant indicating a rejection of model fit. The root mean square error of approximation (RMSEA) was .184, which is greater than the desired RMSEA $\leq .05$ (Kline, 2010), also suggesting poor fit. The comparative fit index (CFI), .86, was below the threshold of reasonable fit (CFI $\geq .90$) and the standardized root mean square residual (SRMR) was .18, exceeding the desired .10 (SRMR $\leq .10$; Kline, 2010).

In response to these results, I consulted the modification indices provided by LISREL to improve model fit. Several alternations were made in order to achieve a better fitting model: (a) specifying direct parameters from descriptive norms and injunctive

norms to alcohol use intensity, (b) specifying a direct parameter from injunctive norms to enhancement motives, (c) specifying a direct parameter from positive alcohol outcome expectancies to social motives, and (d) specifically direct parameters from negative alcohol outcome expectancies to conformity motives and alcohol-related negative consequences. During this process, a priori hypotheses and the motivational model of alcohol use (Cox & Klinger, 1988, 2011) were consulted. The revised model is depicted in Figure 5.
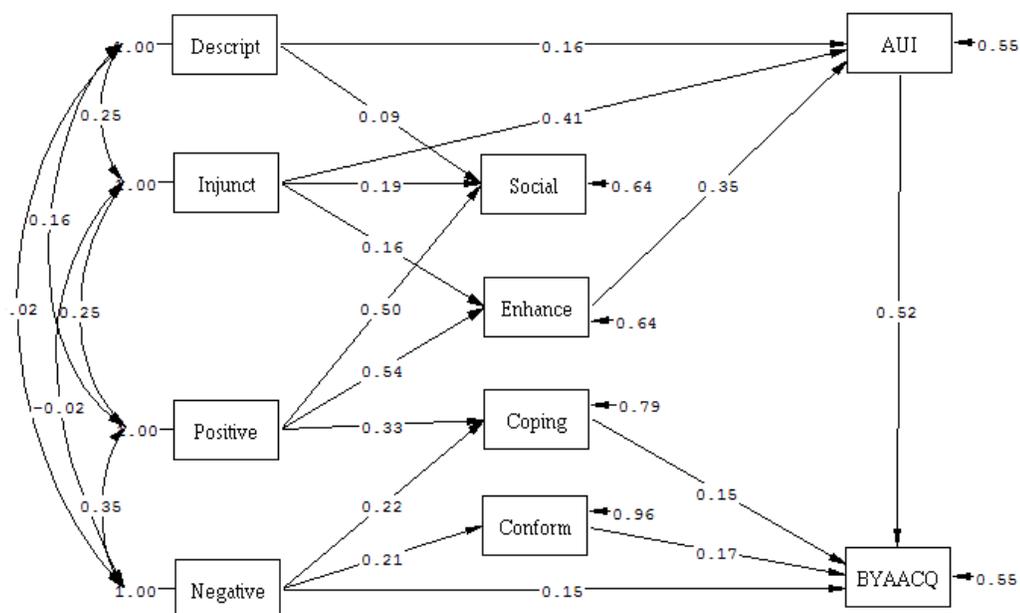
Descript = Descriptive Norms; Injunct = Injunctive Norms; Positive = Positive Alcohol Outcome Expectancies; Negative = Negative Alcohol Outcome Expectancies; Conform = Conformity Motives, Social = Social Reinforcement Motives; Enhance = Enhancement Motives; Coping = Coping Motives; AUI = Alcohol Use Intensity. BYAACQ = Brief Young Adult Alcohol Consequences Scale. For visual ease, non-significant parameters and the correlated errors between drinking motives are not shown in the above diagram.

Figure 5. Standardized solution of revised model (*N* = 445).

Global goodness-of-fit statistics revealed that the revised model provided a more acceptable fit for the data. Although, $\chi^2 = 31.41$ ($df = 14$, $p < .01$) was statistically significant, this statistic can be influenced by sample size (Kline, 2010). RMSEA, which accounts for large sample sizes (Kline, 2010), was .05 and within the threshold of the desired RMSEA ≤ 0.05, indicating close approximate fit. The CFI and SRMR each were within their desired thresholds suggesting good model fit. Further, χ^2 difference test comparing models was statistically significant ($\Delta \chi^2 = 285.38$, $df = 6$, $p < .01$) suggesting that the revised model is a better fit for the data. Goodness-of-fit indices for both the hypothesized model and the revised model are depicted in Table 14.

Table 14

Goodness of Fit Indices for Hypothesized and Revised Model

Goodness of Fit Indices	Hypothesized Model	Revised Model
X^2	316.79	31.41
df	20	14
p value	.00	.01
RMSEA	.18	.05
CFI	.86	.99
SRMR	.18	.04

Note. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Because assessing model fit is a qualitative process, the selection of specific fit indices to analyze and guidelines for interpreting their results were drawn from Kline (2010) as well as Schumacker and Lomax (2010). Overall, the revised model accounted

for approximately 45% of the variance in Alcohol Use Intensity (R^2 = .45) and alcohol-related negative consequences (R^2 = .45), respectively. The standardized solutions for both the hypothesized and revised model are presented in Table 15.

Table 15

Standardized Solution (ML) Estimates for Hypothesized Model and Revised Model

Parameter	Hypothesized Model	Revised Model
Direct effects		
Descriptive → AUI	N/A	.16*
Descriptive → Social Motives	.13*	.09*
Descriptive → Conformity Motives	.02	.03
Injunctive → Social Motives	.15*	.19*
Injunctive → AUI	N/A	.41*
Injunctive → Enhancement Motives	N/A	.16*
Injunctive → Conformity Motives	-.13*	-.06
Positive → Social Motives	N/A	.50*
Positive → Enhancement Motives	.35*	.54*
Positive → Coping Motives	.17*	.33*
Negative → Enhancement Motives	-.06	-.03
Negative → Coping Motives	.18*	.22*
Negative → Conformity Motives	N/A	.21*
Negative → BYAACQ	N/A	.15*
Enhancement Motives → AUI	.38*	.35*
Social Motives → AUI	.15*	.01
Conformity Motives → BYAACQ	.19*	.17*
Coping Motives → BYAACQ	.19*	.15*
AUI → BYAACQ	.51*	.52*

Table 15 (cont.)

Parameter	Hypothesized Model	Revised Model
Disturbance variances		
Injunctive Norms	1.00*	1.00*
Descriptive Norms	1.00*	1.00*
Positive	1.00*	1.00*
Negative	1.00*	1.00*
Conformity Motives	.99*	.96*
Social Motives	.95*	.64*
Enhancement Motives	.89*	.64*
Coping Motives	.92*	.79*
Alcohol Use Intensity	.77*	.55*
BYAACQ	.57*	.55*
Correlated error variance		
Injunctive ↔ Descriptive	.25*	.25*
Injunctive ↔ Positive	.25*	.25*
Injunctive ↔ Negative	-.02	-.02
Descriptive ↔ Positive	.16*	.16*
Descriptive ↔ Negative	.02*	.02
Positive ↔ Negative	.35*	.35*
Conformity Motives ↔ Social Motives	.40*	.29*
Conformity Motives ↔ Enhance Motives	.31*	.21*
Conformity Motives ↔ Coping Motives	.36*	.29*
Social Motives ↔ Enhancement Motives	.57*	.35*
Social Motives ↔ Coping Motives	.41*	.26*
Enhancement Motives ↔ Coping Motives	.41*	.28*

Note. *p < .01. AUI = Alcohol Use Intensity.

Hypotheses Two through Five: Direct Effects

Hypotheses two, three, four, and five relate to direct effects among exogenous and endogenous variables within the hypothesized model. Because the revised model provided a better fit for the data, standardized solutions for the revised model, presented in Table 15, will be consulted to evaluate associations among these variables.

Hypothesis two stated that injunctive and descriptive norms would positively predict social reinforcement and conformity drinking motives. In the revised model, neither descriptive nor injunctive norms significantly predicted conformity drinking motives; however, social reinforcement drinking motives were positively predicted by injunctive and descriptive norms. Examining standardized coefficients of direct effects indicates that injunctive norms possessed a more robust relationship with social reinforcement drinking motives ($\beta = .19$) compared to descriptive norms ($\beta = .09$). Combined with positive alcohol outcome expectancies, a parameter added to the revised model, these variables explained a moderate amount of variance in social reinforcement motives ($R^2 = .36$).

Hypothesis three stated that positive and negative alcohol outcome expectancies were expected to positively predict coping and enhancement drinking motives. In the revised model, negative alcohol outcome expectancies did not significantly predict enhancement drinking motives. Analysis of the results indicated that positive alcohol outcome expectancies positively predicted both enhancement and coping drinking motives. Comparatively, positive alcohol outcome expectancies possessed a stronger relationship with enhancement motives ($\beta = .54$) than coping motives. Although negative

alcohol outcome expectancies were not found to be predictive of enhancement motives, this variable was positively associated with coping drinking motives, and the standardized coefficient of this direct effect was .22. Overall, negative and positive alcohol outcome expectancies combined to account for approximately 21% of the variance in coping drinking motives.

Hypothesis four stated that both social and enhancement motives would positively predict alcohol use intensity. An examination of the standardized solutions for the revised model (Table 15) indicates that this hypothesis was only partially confirmed. Social reinforcement drinking motives was not significantly associated with alcohol use intensity. Enhancement drinking motives, however, were found to a robust predictor of alcohol use intensity ($\beta = .35$).

Hypothesis five stated that both negative drinking motives were expected to positively predict alcohol-related negative consequences. As hypothesized, both coping ($\beta = .15$) and conformity ($\beta = .17$) drinking motives were positively predictive of alcohol-related negative consequences in the revised model (Table 15). Comparatively, conformity motives had a stronger relationship with alcohol-related negative consequences.

Hypotheses Six through Ten: Indirect Effects

Hypotheses six through ten addressed indirect associations among the study variables. To test indirect effects, a non-parametric bias-corrected bootstrapping procedure developed by Preacher and Hayes (2008) was utilized. Bias-corrected bootstrapping is a procedure in which indirect effects are estimated from multiple

resamples from the data set (MacKinnon, 2008). During this process, each bootstrap sample is adjusted in order to correct for potential bias in the estimate of the statistic (MacKinnon, 2008). For the purposes of the present study, the bootstrap estimates are based on 5,000 bootstrap samples. Point estimates for each indirect effect and a 95% confidence interval (CI) for the distribution are estimated from the multiple resamples of the data set. Confidence intervals that do not include zero indicate significance of the indirect effect (Preacher & Hayes, 2008).

Non-parametric procedures possess several advantages over normal theory approaches, such as the Sobel test of mediation (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Mallinckrodt, Abraham, Wei, and Russell (2006) noted that because the product of two normally distributed variables tends to be asymmetric, the corresponding Z test lacks statistical power relative to methods that attempt to correct for this asymmetry. Another advantage of this procedure is that it allows for inclusion of covariates in the development of the indirect effect models. This is important for the present study because many of the mediating variables have more than one independent variable. By controlling for the influence of other related variables, this procedure provides a more accurate presentation of the indirect relationship of the specified independent variable on the dependent variable through the mediator variable. Further, this procedure reports the total variance accounted for by the independent variable, mediator variable, and covariates on the dependent variable, providing insight into which groups of variables within the path model account for a meaningful proportion of variance in alcohol use intensity and alcohol-related negative consequences.

Hypothesis six stated that conformity motives would mediate the relationship between descriptive and injunctive norms and alcohol-related negative consequences. Contrary to the hypothesis, neither descriptive nor injunctive norms significantly predicted conformity motives in the revised model (Figure 5). Although no direct significant relationships were found between conformity motives and these variables, the addition of a statistically significant parameter from negative alcohol outcome expectancies and conformity motives improved model fit. The inclusion of this parameter allowed for an indirect test of the mediating role of conformity motives in the association between negative alcohol outcome expectancies and alcohol-related negative consequences. Given that a parameter between negative alcohol outcome expectancies and alcohol-related negative consequences also was included to improve model fit, this test would assess whether conformity motives was a partial mediator of these variables. Bootstrapping analysis revealed that conformity drinking motives was a significant mediator of the association between negative alcohol outcome expectancies and alcohol-related negative consequences ($p < .05$). The point estimate, standard error, and 95% confidence intervals are presented in Table 16. In total, negative alcohol outcome expectancies and conformity drinking motives accounted for a small portion of variance in alcohol-related negative consequences ($R^2 = .11$).

Hypothesis seven stated that coping motives would mediate the relationship between alcohol outcome expectancies (positive and negative) and alcohol-related negative consequences. In the revised model, direct relationships among alcohol outcome expectancies and coping motives as well as coping motives and alcohol-related negative

consequences were statistically significant, making it possible to test the indirect relationship among these variables. Examination of 95% confidence intervals revealed (Table 16) that conformity drinking motives was a significant mediator of the relationship between both positive and negative alcohol outcome expectancies and alcohol-related negative consequences. Approximately 22% of the variance in alcohol-related negative consequences was explained by positive alcohol outcome expectancies, negative alcohol outcome expectancies, and coping motives.

Table 16

Test of Indirect Effects

Mediation	Point Estimate	SE	BC 95% CI	
			Lower	Upper
Negative → Conform → BYAACQ	0.51	0.15	0.26	0.85
Positive → Coping → BYAACQ	0.86	0.18	0.54	1.26
Negative → Coping → BYAACQ	0.61	0.17	0.33	0.99
Positive → Enhancement → AUI	0.79	0.13	0.54	1.06
Injunctive → Enhancement → AUI	0.17	0.05	0.09	0.27
Enhancement → AUI → BYAACQ	1.07	0.14	0.80	1.36

Note. BC = Bias-Corrected; CI = Confidence Interval; Conform = Conformity; AUI = Alcohol Use Intensity; BYAACQ = Brief Young Adult Alcohol Consequences Questionnaire; Confidence intervals that do not include zero indicate significance.

Hypothesis eight stated that social motives were expected to mediate the relationship between social norms variables (descriptive and injunctive norms) and alcohol use intensity. Contrary to the hypothesis, social motives did not significantly predict alcohol use intensity in the revised model. Because a significant direct association

between social reinforcements and alcohol use intensity was not observed, the indirect effects of social reinforcement motives on the social norms variables and alcohol use intensity could not be directly assessed. Assessment of modification indices revealed unhypothesized direct associations between descriptive and injunctive norms on alcohol use intensity. Injunctive norms, in particular, were found to be a robust predictor of alcohol use intensity within the present sample ($\beta = .41$).

Hypothesis nine stated that enhancement drinking motives were hypothesized to mediate the relationship between positive and negative alcohol outcome expectancies and alcohol use intensity. In the revised model, a statistically significant relationship was not found between negative alcohol outcome expectancies and enhancement drinking motives, making only a partial test of this hypothesis possible. Bootstrapping revealed that enhancement drinking motives were a significant mediator in the association between positive alcohol outcome expectancies and alcohol use intensity (Table 16). Further, an unhypothesized significant direct path emerged between injunctive norms and enhancement motives. The indirect relationship of injunctive norms and alcohol use intensity through enhancement motives was found to be significant (i.e., confidence intervals do not include zero). A considerable amount of variance (43%) in alcohol use intensity was explained by positive alcohol outcome expectancies, injunctive norms, and enhancement motives.

Hypothesis ten stated that alcohol use intensity would mediate the relationship between social reinforcement and enhancement drinking motives and alcohol-related negative consequences. In the revised model, a statistically significant relationship was

not found between social reinforcement drinking motives and alcohol use intensity, making only a partial test of this hypothesis possible. Bootstrapping analysis revealed that alcohol use intensity was a significant mediator of the association between enhancement drinking motives and alcohol-related negative consequences (Table 16). These variables combined to explain approximately 38% of the variance in alcohol-related negative consequences.

Hypotheses 11 and 12: Tests of Invariance across Groups

Hypotheses eleven and twelve stated that the model would be an acceptable fit across sex and first-year student status. Further, it was hypothesized that associations between alcohol social norms, outcome expectancies, drinking motives, alcohol use intensity, and alcohol-related negative consequences would be stronger among male students and first-year students, respectively. To test each hypothesis, the model was first estimated with all paths constrained to be equal across groups. Modification indices were then consulted to identify which parameters were free and allowed to vary across groups in order to improve overall model fit. The constrained and partially unconstrained models were then compared utilizing χ^2 difference tests to evaluate improvement of model fit.

Hypothesis eleven stated that the model would be a good fit for both male and female students. Further, it was posited that relationships among social norms, alcohol outcome expectancies, drinking motives, alcohol use intensity, and alcohol-related negative consequences would be stronger among male students. Evaluation of global goodness-of-fit indices of the constrained model (Table 17) indicated that the model was an acceptable fit for both male and female students in the research sample. A review of

the modification indices revealed that a statistically significant decrease in χ^2 would occur by relaxing the following constraints to vary across sex: (a) direct parameter between positive alcohol outcome expectancies and coping drinking motives and (b) direct parameter between coping drinking motives and alcohol-related negative consequences. The χ^2 difference test indicated that the partially restrained model was a more satisfactory fit, $\Delta\chi^2 = 11.28$, $df = 2$, $p = .00$. The partially restrained model also possessed more desirable RMSEA and CFI statistics (Table 17).

Table 17

Goodness of Fit Indices for Multiple Group Test for Invariance by Sex

Goodness of Fit Indices	Constrained Model	Unconstrained Model
X^2	99.50	88.22
df	59	57
p value	.00	.01
RMSEA	.06	.05
CFI	.98	.99

Note: df = Degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index.

A review of the unconstrained parameters suggests partial support for the hypothesis. The standardized coefficient for positive alcohol outcome expectancies and coping motives was more robust for male students ($\beta = .51$) compared to their female counterparts ($\beta = .26$). Similarly, the standardized coefficient for coping motives and alcohol-related negative consequences was greater for male students ($\beta = .23$) than for

females in the sample ($\beta = .09$). Analysis of the modification indices indicated that freeing equality constraints between other parameters within the path model would not produce a significant change in χ^2 (i.e., reduction in $\chi^2 \geq 3.84$).

Hypothesis twelve stated that the model will be an acceptable fit for both first-year students and upperclassmen. Further, it was hypothesized that associations between alcohol social norms, outcome expectancies, drinking motives, alcohol use intensity, and alcohol-related negative consequences would be stronger among first-year students. Due to the low number of first-year students in the research sample ($n = 77$), the researcher elected to combine first and second year students ($n = 146$) in order to compare model fit among early career undergraduates or underclassmen (i.e., first and second year students) and upperclassmen (i.e., students in their third, four, or fifth year in college). This combined group of "underclassmen" was closer in size to the desired participant to parameter ratio required of multiple group path models described by Kenny (2011).

Evaluation of goodness-of-fit indices of the constrained model (Table 18) indicated that the model was an acceptable fit for both underclassmen and upperclassmen in the sample. A review of the modification indices revealed that a significant decrease in χ^2 would occur by relaxing the following constraints to vary across group: (a) parameter between conformity drinking motives and alcohol-related negative consequences and (b) parameter between negative alcohol outcome expectancies and coping drinking motives. The χ^2 difference test indicated that the partially restrained model was a more satisfactory fit, $\Delta\chi^2 = 16.63$, $df = 2$, $p = .00$. The partially constrained model also possessed more desirable RMSEA and CFI statistics (Table 19).

Table 18

Goodness of Fit Indices for Multiple Group Test for Invariance by Class Year

Goodness of Fit Indices	Constrained Model	Unconstrained Model
X^2	104.73	88.10
df	59	57
p value	.00	.01
RMSEA	.06	.05
CFI	.98	.99

Note: df = Degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index.

Parameters freed during the multi-group test of invariance provided mixed support for the hypothesis. More specifically, there appeared to a stronger relationship between negative alcohol outcome expectancies and coping drinking motives among underclassmen ($\beta = .34$) compared to upperclassmen ($\beta = .17$). Although this relationship supports the hypothesis that relationships among variables would be stronger among early career undergraduates, the association between conformity drinking motives and alcohol-related negative consequences was more robust among upperclassmen ($\beta = .23$) compared to first and second year students ($\beta = .02$). It is important to note that this finding may be an artifact of combining first-year students and second-year students into a single group and not being able to compare first-year students and upperclassmen. Review of the modification indices revealed that freeing equality constraints between other parameters within the model would not produce a significant decrease in $\Delta\chi^2$.

Summary of the Results

The purpose of this chapter was to test twelve hypotheses derived from the research questions presented in Chapter I. The first hypothesis, that the proposed path model would be an acceptable fit was not supported. Utilizing modification indices, a revised model emerged that was a satisfactory fit for the data. This revised model included unhypothesized direct associations between drinking outcome variables, alcohol use intensity and alcohol-related negative consequences, and social norms variables. Further, several hypothesized direct relationships among exogenous and endogenous variables, including social norms variables and external drinking motives, were not found to be statistically significant.

Hypotheses two through five stated that direct relationships among variables would exist in a manner consistent with the motivational model of alcohol use (Cox & Klinger, 1988, 2011). These hypotheses received partial support. Neither descriptive norms nor injunctive norms were associated with conformity drinking motives; however, both social norms variables predicted social drinking motives providing partial support for hypothesis two. Hypothesis three stated that alcohol outcome expectancies were expected to positively predict internal drinking motives. This hypothesis was partially supported in that both internal drinking motives were predicted by positive alcohol outcome expectancies; whereas, negative alcohol outcome expectancies only predicted coping motives. Hypothesis four stated that both social and enhancement motives would positively predict alcohol use intensity. Although enhancement drinking motives were associated with alcohol use intensity, social reinforcement motives were not, thereby

providing only partial support for this hypothesis. Finally, hypothesis five stated that both negative drinking motives were expected to positively predict alcohol-related negative consequences. This hypothesis was fully supported within the revised model with both conformity and coping motives significantly associated with alcohol-related negative consequences.

Hypotheses six through ten stated that indirect relationships would exist among study variables in a manner consistent with Cox and Klinger's (1988, 2011) motivational model of alcohol use. Hypothesis six which stated that conformity motives would mediate the relationship between social norms variables and alcohol-related negative consequences was not supported. Contrary to the hypothesis, neither descriptive nor injunctive norms significantly predicted conformity motives in the revised model. Hypothesis seven stated that coping motives would mediate the relationship between alcohol outcome expectancies and alcohol-related negative consequences. This hypothesis was fully supported with conformity drinking motives serving as a mediator of the relationship between both positive and negative alcohol outcome expectancies and alcohol-related negative consequences. Hypothesis eight which stated that social reinforcement motives were expected to mediate the relationship between social norms variables and alcohol use intensity was not support. In the revised model, social reinforcement motives did not significantly predict alcohol use intensity. Hypothesis nine posited that enhancement drinking motives were hypothesized to mediate the relationship between alcohol outcome expectancies and alcohol use intensity. Enhancement drinking motives were a significant mediator in the association between positive alcohol outcome

expectancies and alcohol use intensity; however, a statistically significant relationship was not found between negative alcohol outcome expectancies and enhancement drinking motives, providing only partial confirmation of the hypothesis. Hypothesis ten which stated that alcohol use intensity would mediate the relationship between positive drinking motives and alcohol-related negative consequences, was partially supported. Alcohol use intensity was found to be a significant mediator of the association between these variables.

Hypotheses eleven and twelve stated that the model would be an acceptable fit across sex and first-year student status. Further, it was hypothesized that associations between study variables would be stronger among male students and first-year students, respectively. Multiple group test of invariance among male and female participants in the sample provided partial support for hypothesis eleven. More specifically, the model fit the data better when parameters between positive alcohol outcome expectancies and coping drinking motives as well as direct parameter between coping drinking motives and alcohol-related negative consequences were allowed to vary. As hypothesized, standardized coefficient for these parameters were more robust among male students, compared to their female counterparts.

Hypothesis twelve posited that the model will be an acceptable fit for both first-year students and upperclassmen and associations between study variables would be stronger among first-year students. Due to the low number of first-year students in the research sample ($n = 77$), these students were combined with second year students to form a group that was compared with upperclassmen (i.e., students in their third, four, or

fifth year in college). Invariance testing indicated that the model was a better fit for the data when parameters between conformity drinking motives and alcohol-related negative consequences as well as negative alcohol outcome expectancies and coping drinking motives were allowed to vary among groups. A stronger relationship was found to exist between negative alcohol outcome expectancies and coping drinking motives among underclassmen compared to upperclassmen; however, the association between conformity drinking motives and alcohol-related negative consequences was more robust among upperclassmen providing mixed support for the hypothesis. In the next chapter, these results will be explored by contrasting them with previous research found within the literature. Limitations of the study and implications of the research findings will be discussed.

CHAPTER V

DISCUSSION

In Chapter IV, the results of hypothesis tests based on the twelve research questions guiding this study were presented. In this chapter, interpretation and discussion of the results is provided. Specifically, descriptive statistics for participants and reliability estimates of the instrumentation are discussed along with their impact on the study. Each hypothesis will be reviewed to explore the relative contribution of perceived norms, alcohol outcome expectancies, and drinking motives on alcohol use intensity and alcohol-related negative consequences within the undergraduate study sample. Limitations of the study along with the theoretical and practical implications for counselors, counselor educators, and future research are examined. Finally, an integration of the various discussions from the chapter is provided.

Participants

The study consisted of 445 full-time undergraduates attending a mid-sized public institution located in the Southeastern United States. All participants were between the ages of 18 and 24 years. Considering that this age range represents a unique period in human psychosocial development associated with increased levels of substance use (Arnett, 2005), limiting the study to this segment of the undergraduate population was appropriate. Further, national surveys of substance use have indicated that young adults between the ages of 18 and 24 years engage in heavy episodic drinking at rates higher

than those in other age groups (SAMSHA, 2012), providing additional support for this selection criterion. The average age of students in the sample was 20.49 ($SD = 1.45$), which is 1.51 years younger than the average age of full-time undergraduates enrolled at the University. Because differences in drinking practices have been found to exist between those below and above the minimum legal drinking age (Wechsler, Lee, Nelson, et al., 2002), the high percentage of underage participants must be taken into account when considering the results of the study.

Most participants in the study were female ($n = 302$, 67.9%). The ratio of male and female participants in the sample was comparable to the ratio of the University at which the data were gathered (65% female; 35% male). The proportion of non-Caucasian participants ($n = 209$; 47.0%), including students who identified as African-American, Asian, Hispanic, and multi-racial, exceeded the total University minority enrollment (37%). The large representation of minority students within the sample may have implications for the results because these students have been found to consume alcohol at lower rates compared to their Caucasian counterparts (SAMHSA, 2012). Only a small proportion of participants reported being involved in varsity athletics ($n = 34$; 7.6%), club sports ($n = 42$; 9.4%), or Greek life ($n = 38$; 8.5%), which is consistent with the percentages of these students' participation within the University.

Students enrolled in their third and fourth years of college ($n = 271$; 60.9%) represented the majority of participants in the study and only a small percentage of students in the sample were in their first year of college ($n = 77$; 17.3%). The modest number of first-year students in the sample made it infeasible to examine group

differences in model fit between these students and their upperclassmen peers. This is because the total number of first-year students within the study sample was well below the 200 observations per group minimum suggested by Kenny (2011). Thirty nine percent (39%) of participants resided in University housing ($n = 157$), which is greater than the percentage of students enrolled at the University who currently reside on campus (32%). Because students who reside in residence halls tend to report lower rates of alcohol abuse compared to students who live with their peers in off-campus housing (Carter, Brandon, & Goldman, 2010), this also may have an impact on the results of the study.

Within the sample, 78.0% of participants reported alcohol consumption during the past thirty days. This percentage of current drinkers (i.e., alcohol use within the past thirty days) is slightly lower than rates of alcohol use reported nationally. Data collected using the National College Health Assessment (NCHA; ACHA, 2012) revealed that 59,859 undergraduates surveyed in spring 2012 consumed alcohol during the past year, and among these students close to 83.0% consumed alcohol within the past 30 days. Although the ratio of male and female students in this national cohort was similar to the research sample (male, 33.4%; female, 65.5%), the NCHA sample was older (average age = 22.59) and had a higher percentage of first-year students (25.8%). These demographic differences may explain the discrepancies in reported rate of alcohol use during the past thirty days. Although the rate of current drinkers within the research sample was somewhat higher among the NCHA cohort, the percentage of students in the sample who engaged in heavy episodic drinking during the past two weeks ($n = 194$; 43.4%) was consistent with the national average (41.2%; ACHA, 2012). Overall,

comparisons to the NCHA dataset suggest that the present sample and American college students in general possess similar patterns of alcohol consumption.

Instruments

The measures used in the study were the Comprehensive Effects of Alcohol Questionnaire (CEOAQ; Fromme et al., 1993), the Drinking Motives Measure-Revised (DMM-R; Cooper, 1994), the Alcohol Use Disorder Identification Test - Consumption (AUDIT-C; Babor et al., 2001), the Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ; Kahler et al., 2005), the Injunctive Norms Rating Questionnaire (Baer, 1994), and three items that assessed same-sex typical student descriptive norms from the Alcohol and Other Drug Survey (Thombs, 1999). The CEOAQ, measuring positive and negative alcohol outcome expectancies, demonstrated good to excellent internal consistency. Indeed, reliability levels within the present sample were stronger than estimates reported in previous research with undergraduates (Neighbors et al., 2007). Greater endorsements of positive alcohol outcome expectancies in comparison to negative alcohol outcome expectancies were reported by the research sample. This pattern is consistent with previous studies that have utilized the CEOAQ to assess these constructs (Neighbors et al., 2007; Valdivia & Stewart, 2005).

Measures assessing endogenous variables within the path model, the DMM-R, the BYAACQ, and the AUDIT-C, each possessed good to excellent reliability estimates. Among drinking motives, social reinforcement motives were most endorsed, followed by enhancement, coping, and conformity drinking motives. Although this pattern is consistent with previous research utilizing this instrument with undergraduates (Martens,

Rocha, et al., 2008), the mean item scores for each motives within the present sample were slightly lower. These differences may be an artifact of the sample; in the study of drinking motives conducted by Martens, Rocha, et al. (2008), the sample was 52% male compared to 32% in the present study. The BYAACQ and AUDIT-C, however, had similar reliability estimates and mean item scores compared to previous studies using these instruments to assess alcohol-related negative consequences with college students (DeMartini & Carey, 2012).

Both measures of social norms possessed low levels of internal consistency. The Injunctive Norms Rating Form had an alpha level of .65, which indicates that 35% of the variance of the scores on this measure is due to error. Item analysis indicated that the alpha level would not increase if any of the four items were removed. Interestingly, previous researchers also have observed internal consistency estimates that were poor to questionable (e.g., .72, Neighbors et al., 2007; .73, Neighbors et al., 2008) suggesting that this instrument may not be an optimal measure of injunctive social norms. The descriptive norms measure also possessed poor internal consistency (.62). Analysis of item-total statistics revealed that excluding the item assessing quantity of consumption increased the reliability coefficient to .68. Because this estimate of reliability was closer to the acceptable level identified by Kelloway (1998) as suitable for use in Path Analysis (.70), the revised two-item measure was used in the study. Despite this increased alpha level, and because lower levels of internal consistency could cause higher error rates, results utilizing both the revised descriptive norms measure as well as the Injunctive Norms Rating Form must be viewed with caution.

Tests of normality revealed that most of the variables had symmetrical distributions, confirming an important assumption of path analysis. Upon assessment of skewness and kurtosis, conformity drinking motives was found to possess a leptokurtic distribution that was positively skewed. Examining response frequencies of the five items that comprised this scale revealed that most participants in the sample endorsed low levels of drinking in order to avoid social sanction. The cluster of responses around lower levels of conformity motives (i.e., *Almost Never/Never* = 1 and *Some of the Time* = 2) may be due to the limited number of first-year students in the present sample; Martens et al. (2008) found that first-year students reported higher levels of conformity motives compared to their peers. Using guidelines outlined by Schumacker and Lomax (2010) on how to transform variables that are clustered (e.g., leptokurtic) and positively skewed, a log 10 transformation was used to better approximate a normal distribution for the variable. Skewness and kurtosis statistics of the transformed variable fell within acceptable ranges.

<div align="center">**Discussion of Hypotheses**</div>

Hypothesis One: Model Fit

The purpose of hypothesis one was to determine whether the hypothesized path model, based on the motivational model of alcohol use (Cox & Klinger, 1988, 2011), was an acceptable fit for the data. Evaluation of global goodness of fit indices indicated that, contrary to the hypothesis, this path model was a poor fit. Using the modification indices provided by LISREL, several parameters between variables were added and the resultant

revised path model was a more acceptable fit for the data. A conceptual diagram

depicting the revised modified path model is presented in Figure 6.
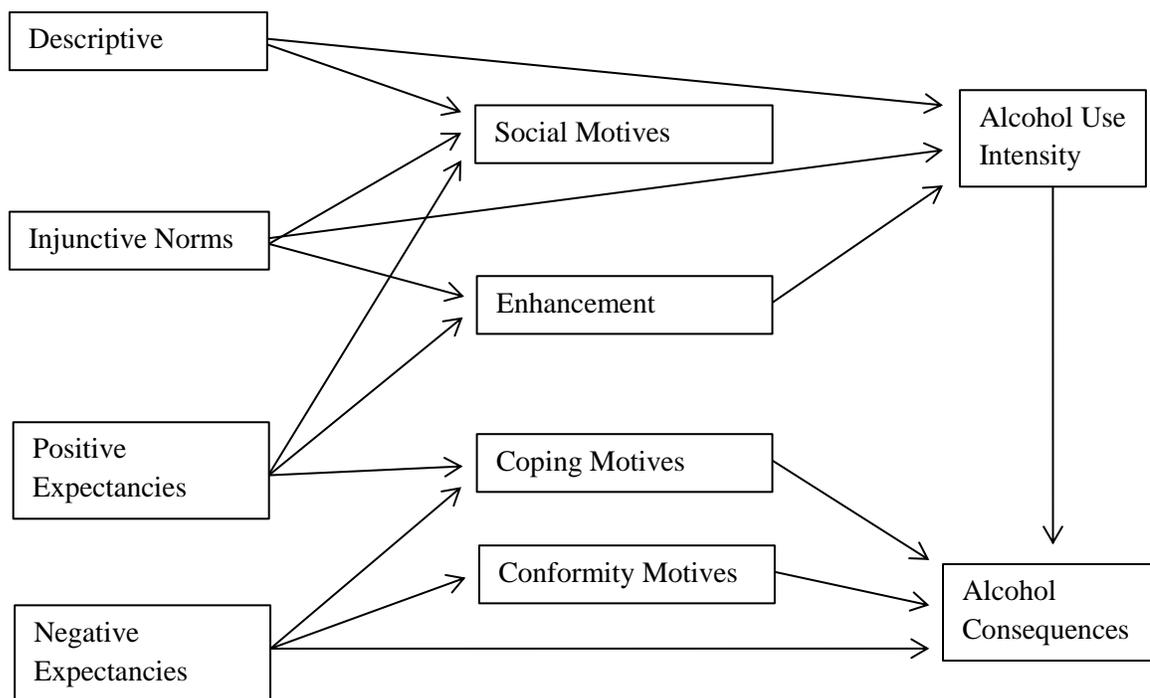
Figure 6. Revised path model of collegiate drinking.

     Results of this hypothesis test indicated that, contrary to the motivational model

of alcohol use (Cox & Klinger, 1988, 2011), drinking motives were not the final common

pathway between psychosocial factors (e.g., social norms and alcohol outcome

expectancies) and alcohol use intensity and alcohol-related negative consequences.

Indeed, the addition of direct paths between social norms variables and alcohol use

intensity resulted in a significantly better fitting model. Including a direct path between

negative alcohol outcome expectancies and alcohol-related negative consequences also

contributed to a more acceptable fit. These results build upon those by Read et al. (2003),

who examined the mediating role of drinking motives utilizing three of the four motives (conformity motives were not included) and found that including a direct path between perceived norms and alcohol use resulted in a significant improvement in model fit. The inclusion of conformity motives in the present study addresses a limitation of the Read et al. (2003) study and provides further evidence that is contrary to the view that drinking motives act as a final pathway that fully mediates the associations between psychosocial factors and drinking outcome variables.

Analysis of the revised path model brings into question another theoretical assumption of the motivational model of alcohol use. Cox and Klinger (2011) have posited that psychosocial factors influence alcohol use behaviors through specific drinking motives. Internal motives serve as a conduit for beliefs associated with the chemical effects of alcohol use and external motives serve as a pathway for beliefs related to the instrumental or non-chemical effects (i.e., social rewards) of drinking. In the revised model, paths were added between beliefs about the chemical effects of alcohol use (positive alcohol outcome expectancies) and external drinking motives (social reinforcement motives) as well as between peer influence (injunctive norms) and internal drinking motives (enhancement motives). These results echo those by Read et al. (2003) and suggest that motives do not act as discrete pathways for specific internal and external psychosocial factors associated with alcohol use intensity and alcohol-related negative consequences.

Although some aspects of the motivational model of alcohol use (Cox & Klinger, 1988, 2011) were not corroborated, the relationships between the various drinking

motives and alcohol outcome variables in the revised model confirm and extend past research on drinking motives. More specifically, it has been argued within the literature (Cooper, 1994) that because coping and conformity motives represent the desire to consume alcohol in order to alleviate negative affect, these motives would have a direct relationship with alcohol-related negative consequences. The direct associations among negative drinking motives and alcohol-related negative consequences were retained in the revised model, thereby confirming previous research examining drinking motives conducted by Cooper (1994), Martens, Rocha, et al. (2008), and Merrill and Read (2010). The present study extends this previous research because, to date, no investigation has examined the relationships between negative drinking motives and alcohol-related negatives consequences within a path or structural model that also included descriptive and injunctive social norms as well as both positive and negative alcohol outcome expectancies.

Hypotheses Two through Five: Direct Effects

Hypotheses two, three, four, and five referred to direct effects that were expected to occur among the variables within the hypothesized model. More specifically, hypotheses two through four related to associations among psychosocial beliefs (i.e., social norms and outcome expectancies) and drinking motives. In the revised model, social norms and outcome expectancy variables accounted for total variance in drinking motives ranging from a modest 4% of conformity motives to 36% of social reinforcement and enhancement drinking motives, respectively. Hypothesis five referred to the direct associations between drinking motives and alcohol use intensity and alcohol-related

negative consequences. In the following subsection, each hypothesis will be examined and contrasted with results of previous studies.

The second hypothesis was that injunctive and descriptive norms would positively predict social reinforcement and conformity motives. This hypothesis was partially supported. Whereas descriptive and injunctive social norms positively predicted social reinforcement motives, neither social norms variable was significantly associated with conformity drinking motives. The significant relationship between social norms variables and social reinforcement motives confirms previous research conducted by Read et al. (2003) as well as Lee et al. (2007). In these studies, significant positive associations were found among these variables.

A significant relationship between social norms variables and conformity motives was not observed in the revised model. This unexpected finding may be related to a number of methodological and theoretical issues. Because of the low alpha levels of the descriptive norms measure and the Injunctive Norms Rating Form, any conclusions related to these variables must be viewed with caution. Further, the large proportion of female participants and low percentage of first-year students in the present study may also have affected this result. Berkowitz (2004) argued that female college students were less involved in the culture of alcohol consumption compared to their male counterparts. Therefore, regardless of their perceptions of normative behavior, these students may be less inclined to drink with the expressed purpose of avoiding social sanction. Additionally, given that conformity motives appear to be more salient among first-year students (Martens, Rocha, et al., 2008), it is possible that the relationship among

perceived norms and drinking to conform is equivocal among upperclassmen. For example, upperclassmen may be less conscious of or influenced by the social sanctions associated with not drinking. The significant direct paths among social norms variables and alcohol use intensity observed in the revised model indicate that although social norms variables play an important role in explaining alcohol use intensity within the sample, they were not associated with consuming alcohol to reduce negative affect caused by social influence. Given the questions raised by these findings, investigation into the relationship between perceived norms and conformity motives is warranted.

Hypothesis three stated that positive and negative alcohol outcome expectancies were expected to predict coping and enhancement motives. This hypothesis was partially supported; although positive alcohol outcome expectancies were associated with both internal drinking motives, negative alcohol outcome expectations were not found to possess a significant association with enhancement drinking motives. These results confirm findings from previous studies where positive alcohol outcome expectancies were related to internal drinking motives (Kuntsche et al., 2007, 2010).

Results from this hypothesis test also extend the existent research literature by providing new evidence regarding the role of negative alcohol outcome expectancies in predicting internal drinking motives. Specifically, the results of the study indicate that possessing increased levels of negative alcohol outcome expectancies contribute to increased levels of drinking to cope. Negative alcohol outcome expectancies, however, do not appear to play a role in explaining variance in drinking to enhance or increase positive affect. Rather, negative alcohol outcome expectancies may be associated with a

specific style of alcohol consumption categorized by drinking to reduce negative affect. Future researchers may wish to examine the role of specific alcohol outcome expectancies (e.g., beliefs that drinking alcohol will result in tension reduction, negative self-perception, cognitive/behavioral impairment) to determine which of these beliefs play a more substantial role in contributing to negative drinking motives.

The fourth hypothesis stated both social reinforcement and enhancement motives would positively predict alcohol use intensity. In the revised model, only enhancement was significantly related to alcohol use intensity. These results are an important contribution to the literature, which has produced mixed findings on the role of social reinforcement motives on alcohol use intensity. Whereas Ham et al. (2009) found that social reinforcement motives had a significant direct relationship with alcohol use intensity (also assessed using the AUDIT-C), a significant relationship between these variables was not found in several other studies of collegiate drinking (Merrill & Read, 2010; Read et al., 2003). Kuntsche, Knibbe, Gmel, and Engels (2005) commented on the inconsistent findings regarding social reinforcement motives, arguing that these motives were more associated with light drinking as opposed to heavier or more intense patterns of alcohol consumption. Results from the present study appear to be consistent with this assertion.

Hypothesis 5 stated that both negative drinking motives were expected to predict alcohol-related negative consequences. This hypothesis was confirmed in the revised model as both conformity and coping motives had a significant positive relationship with alcohol-related negative consequences. These results are important as they demonstrate

that negative drinking motives represent a problematic mindset related to drinking that is directly associated with alcohol-related negative consequences. Further, these findings are consistent with previous studies that had found a relationship between these variables (Cooper, 1994; Merrill & Read, 2010), and contradict comments made by LaBrie et al. (2012) that conformity drinking motives were not related to collegiate drinking and therefore should not be assessed within this population. In the present sample, students who reported increased levels of drinking to avoid social sanction were more likely to report greater levels of alcohol-related negative consequences.

Hypotheses Six through Ten: Indirect Effects

Hypotheses six, seven, eight, and nine were assessed using a non-parametric bias-corrected bootstrapping procedure to examine indirect effects among the study variables. The bootstrapping procedure offers many advantages over normal theory approaches (i.e., the Sobel Test) to assess mediation, such as higher statistical power and lower probability of committing a Type I error (Preacher & Hayes, 2008). Bootstrapping was used to test certain assumptions outlined in the motivational model of alcohol use (Cox & Klinger, 1988, 2011). Each hypothesis will be explored and interpreted in the subsequent subsection.

Hypothesis six stated that conformity motives would mediate the relationship between descriptive and injunctive norms and alcohol-related negative consequences. This hypothesis was not directly assessed because, despite there being a significant association between conformity motives and alcohol-related negative consequences, neither injunctive nor descriptive social norms had a significant relationship with

conformity motives. Further, in the revised model, direct path coefficients emerged between social norm variables and alcohol use intensity indicating these factors played an important role in explaining alcohol use intensity. Although the unhypothesized direct relationships between the social norms variables and alcohol use intensity are consistent with what has been found in previous studies (Neighbors et al., 2007, 2008), it is puzzling that neither type of perceived norm significantly explained conformity motives. This finding may have been related to low levels of internal consistency in both measures of social norms. Further, the composition of the research sample may also have influenced these results. The sample was comprised mostly of upperclassmen (82.7%), who are less likely to report higher levels of conformity motives compared to first-year college students (Martens, Rocha, et al., 2008). Conformity motives may not be as salient to upperclassmen because they are more likely to have well-established peer networks compared to first-year students. Past research indicates that, as students advance through college, they select peer groups with similar drinking habits (Capone et al., 2007). Therefore, because upperclassmen are surrounded by peers who share similar attitudes and behaviors related to alcohol use, they will be less likely to report use in order to avoid social sanction.

The seventh hypothesis presented was that coping motives would mediate the relationship between alcohol outcome expectancies and alcohol-related negative consequences. This hypothesis was supported in the present study with coping motives mediating the association between both negative and positive alcohol outcome expectancies and alcohol-related negative consequences. Alcohol outcome expectancies

and coping drinking motives explained 22% of the variance in alcohol-related negative

consequences, which was nearly half of the total variance in alcohol-related negative

consequences accounted for by the model ($R^2 = 0.45$). These findings confirm what

previous researchers have found in that drinking motives mediated the relationship

between beliefs about drinking and drinking behavior (Kuntsche et al., 2007, 2010).

Unexpectedly, the inclusion of a direct path between negative alcohol outcome

expectancies and alcohol-related negative consequences improved overall model fit,

indicating that coping motives only partially mediated the association between these

variables.

The presence of both direct and indirect (through coping motives) relationships

between negative alcohol outcome expectancies and alcohol-related negative

consequences demonstrates the important role that these expectancies play in predicting

alcohol-related negative consequences. These results support past findings where

negative alcohol outcome expectancies emerged as a positive predictor of alcohol-related

negative consequences (Neighbors et al., 2007) and possess implications for brief

intervention and treatment. Based on the current findings, counselors should consider

incorporating cognitive behavioral techniques to address alcohol outcome expectancies

when treating college clients who report that they drink in order to alleviate negative

affect.

Hypothesis eight stated that social reinforcement motives would mediate the

relationship between social norms variables and alcohol use intensity. This hypothesis

was not directly assessed because, in the revised model, social reinforcement motives and

alcohol use intensity did not possess a significant relationship. Although social

reinforcement motives did not predict either of the drinking outcome variables in the

study, descriptive and injunctive social norms emerged in the revised model as direct

predictors of alcohol use intensity. Among social norms variables, injunctive norms had a

more robust relationship with both alcohol use intensity ($\beta = 0.41$) and social

reinforcement drinking motives ($\beta = 0.19$) compared to descriptive norms. This finding

suggests that perceived permissiveness regarding alcohol use may be more important in

explaining alcohol consumption compared to perceived use. However, this pattern may

also be related to the proximity of the reference group assessed by each measure; the

Injunctive Norms Rating Form assessed drinking approval of close friends, whereas the

descriptive norms measure assessed perceived use by typical students of the same sex at

the participant's University. Investigating the respective influence of multiple social

norms reference groups on social reinforcement drinking motives and alcohol use

intensity may help clarify these findings.

The ninth hypothesis stated that enhancement motives would mediate the

relationship between alcohol outcome expectancies and alcohol use intensity. As posited,

enhancement motives mediated the relationship between positive alcohol outcome

expectancies and alcohol use intensity. Contrary to the hypothesis, negative alcohol

outcome expectancies were not associated with enhancement motives; therefore, a direct

evaluation of this relationship was not conducted. In the revised model, negative alcohol

outcome expectancies emerged as a key predictor of alcohol-related negative

consequences. These findings provide additional evidence that both positive and negative

alcohol outcome expectancies are positively associated to drinking outcomes, as they each possessed a unique role in explaining alcohol use intensity and alcohol-related negative consequences within the present sample.

Hypothesis ten predicted that alcohol use intensity would mediate the relationship between social and enhancement motives and alcohol-related negative consequences. This hypothesis was partially supported as alcohol use intensity mediated the association between enhancement drinking motives and alcohol-related negative consequences. Social reinforcement drinking motives did not have a significant relationship with alcohol use intensity; therefore, a test of the indirect effects of this drinking motive on alcohol-related negative consequences was not possible. Overall, 38% of the variance in alcohol-related negative consequences was explained by enhancement motives and alcohol use intensity. These results are consistent with previous findings from researchers who found that drinking to enhance positive affect was related to alcohol-related negative consequences indirectly through alcohol use intensity (Read et al., 2003). Given these results, it seems intuitive that in order to reduce rates of alcohol-related negative consequences among college students who drink primarily for enhancement purposes, the quantity and frequency of their use must be addressed.

Hypotheses 11 and 12: Tests of Invariance across Groups

Multiple group tests of invariance were used to evaluate hypotheses eleven and twelve. The purpose of each hypothesis was to confirm the fit of the model and identify variations in the magnitude of specific path coefficients between two groups represented within the sample. This process began by estimating the model with all paths constrained

to be equal across groups. Modification indices were then consulted to identify which parameters to free and allow to vary across groups in order to improve overall model fit. Results of the multiple group tests of invariance are presented in the following subsection.

Hypothesis eleven stated that the model would be a good fit for both male and female students in the sample. Further, it was hypothesized that relationships among social norms, alcohol outcome expectancies, drinking motives, alcohol use intensity, and alcohol-related negative consequences would be stronger among male students. The test of multiple group invariance indicated that allowing paths for positive alcohol outcome expectancies and coping motives as well as coping motives and alcohol-related negative consequences to vary would significantly improve the fit of the model. For each of the two freed paths, the standardized coefficients were greater in magnitude among male students.

Results of this hypothesis test are similar to past research that has examined differences in alcohol expectancies among male and female students (Piane & Safer, 2008) and extends previous findings on coping motives that did not assess for group invariance by sex (Merrill & Read, 2010). An important limitation that may explain why more differences were not observed among the variables was sample size. The number of participants that comprised the male group ($n = 148$) was considerably lower than the minimum of 200 per group recommended by Kenny (2011). Smaller numbers within this group may have masked possible invariance between male and female students in the sample. Despite this limitation, group differences were observed among some of the

study variables, indicating that future investigation examining the role of sex to explain the motivational, cognitive, and social factors that influence collegiate drinking is warranted.

The purpose of the twelfth hypothesis was to determine if the model would be an acceptable fit for both first-year students and upperclassmen. Further, it was posited that the magnitude of associations between study variables would be stronger among first-year students. Due to the small proportion of first-year students in the research sample (17.3%), I decided to combine these participants with second year students so that the total number of participants in this group ($n = 146$) would be closer to the 200 minimum per group recommended by Kenny (2011). Comparing underclassmen (i.e., first-year and second-year students) with upperclassmen represents a limitation of this hypothesis test and results should be interpreted with caution. This is because combining first-year students, who typically engage in higher levels of heavy episodic drinking (Borsari et al., 2007), with second-year students, a group that has not been identified within the literature as a high-risk population, may result in fewer differences observed than what may actually exist between upperclassmen and first-year students alone.

The test of multiple group invariance indicated that allowing paths for negative alcohol outcome expectancies and coping motives as well as conformity motives and alcohol-related negative consequences to vary by group would significantly improve the fit of the model. Comparing standardized coefficients revealed that the association between negative alcohol outcome expectancies and coping motives was stronger among underclassmen compared to upperclassmen; however, contrary to the hypothesis, the

association between conformity drinking motives and alcohol-related negative consequences was more robust among upperclassmen compared to first and second year students. The stronger relationship between negative alcohol outcome expectancies and coping drinking motives among underclassmen is consistent with previous research that found that endorsement of alcohol outcome expectancies decreases as students advance through college (Sher et al., 1996).

The more robust relationship between conformity drinking motives and alcohol-related negative consequences among upperclassmen was counter to the hypothesis and may have been due to the combination of first-year and second year students as one group. An alternative hypothesis for this result is that because upperclassmen are more likely to have well-established peer groups, consuming alcohol in order to avoid social rejection may represent a more problematic and serious style of drinking compared to drinking to conform by first and second year students who still may be forming their social networks. Future research examining class year or age differences in alcohol outcome expectancies, social norms, drinking motives, and alcohol outcome variables may further explicate these findings.

Major Findings

In the present study, a model of collegiate drinking was tested that included cognitive, motivational, and social factors associated with alcohol use intensity and alcohol-related negative consequences. Testing this integrative model meets the call within the literature to test explanatory and mediation models of college student drinking to examine the complex array of variables associated with drinking behaviors (Baer,

2002; Burke & Stephens, 1999; Oei & Morawska, 2004). The results of this study build on existent research and provide greater insight into the unique roles of drinking motives, social norms variables, and alcohol outcome expectancies in explaining collegiate drinking. Further, this study revealed important findings related to the motivational model of alcohol use proposed by Cox and Klinger (1988, 2011).

In the revised path model, both injunctive and descriptive social norms had a significant direct relationship with alcohol use intensity, confirming previous studies that have demonstrated the importance of these constructs in explaining collegiate drinking (Neighbors et al., 2007). Positive alcohol outcome expectancies had an indirect association with drinking outcome variables through enhancement and coping drinking motives. Importantly, negative alcohol outcome expectancies were found to have both a direct and indirect (through coping motives) association with alcohol-related negative consequences suggesting that this construct plays a key role in explaining motives and behaviors associated with problematic drinking. Overall, injunctive social norms and enhancement drinking motives possessed the strongest relationships with alcohol use intensity, whereas negative drinking motives had the strongest effect on alcohol-related negative consequences.

Important findings of this study relate to assumptions outlined in the motivational model of alcohol use (Cox & Klinger, 1988, 2011). Several key elements of this theory were not supported in the revised path model. Drinking motives did not act as the final common path to alcohol use intensity and alcohol-related negative consequences as predicted; model fit significantly improved when direct paths between social norms

variables, negative alcohol outcome expectancies, and the drinking outcome variables were added. These direct relationships were supported when model fit was examined by sex and class year status.

The unique roles of external and internal drinking motives that were hypothesized to link psychosocial beliefs (i.e., alcohol outcome expectancies and social norms) with alcohol use intensity and alcohol-related negative consequences was not supported. According to Cox and Klinger (1988, 2011), beliefs about the instrumental effects of drinking (i.e., perceived norms) influenced alcohol consumption through external drinking motives (i.e., social reinforcement and conformity), whereas beliefs about the chemical effects of drinking influenced use by way of internal drinking motives (i.e., enhancement and coping). In the revised model, beliefs about the instrumental effects of alcohol use (i.e., injunctive social norms) were associated with internal drinking motives (i.e., enhancement motives) and beliefs about the chemical effects of alcohol use (i.e., positive alcohol outcome expectancies) were associated with external drinking motives (i.e., social reinforcement motives).

Although the pathways based on specific source of motives (i.e., external versus internal) were not confirmed, evidence was found in support of the unique roles that positive and negative drinking motives play in explaining alcohol use intensity and alcohol-related negative consequences. Specifically, negative drinking motives had a significant and direct relationship with alcohol-related negative consequences and enhancement drinking motives had a significant relationship with alcohol use intensity. In total, study findings suggest that researchers should conceptualize drinking motives based

on valence (i.e., positive versus negative) rather than by source (i.e., internal versus external).

Limitations

Results of this study served to illuminate the associations between social norms, alcohol outcome expectancies, drinking motives, and collegiate drinking. It is important, however, to interpret these findings within the context of the existing limitations. The research sample was recruited using convenience sampling from one midsized University located in the southeastern United States. Accordingly, study findings may not be generalizable among undergraduates in other geographic regions. The use of convenience sampling also limits the generalizability of the study results because the sample was not recruited at random. Although efforts were made to recruit participants representing a variety of academic majors and programs, it is possible that students who major in subjects other than public health or sociology are underrepresented in the sample. Further, the sample is comprised of only those students who volunteered to participate in the study. It is unknown how these students might differ in alcohol consumption in comparison to their peers who choose not to participate in the study.

Another methodological limitation of the study was that data were collected using self-report measures. As a result, it is possible that some participants responded in a socially desirable manner. To address this concern, efforts were made to reduce response bias, such as by providing clear instructions and obtaining a waiver of signed informed consent to ensure participant anonymity. Researchers have found that using these strategies with collegiate populations increases the likelihood that self-report data

provides reliable and valid results (Del Boca & Darkes, 2003). Further, in a meta-analytic investigation of self-report bias in college settings, Borsari and Muellerleile (2009) found little mean difference between collateral estimates of participant drinking and participant self-report. These results indicated that self-report is a valid approach to obtaining estimates of alcohol use.

Additional limitations relate to the specific measures used in the study. Two measures, the Injunctive Norms Rating Form and the descriptive norms measure, possessed low levels of internal consistency. Accordingly, these low reliability estimates should be considered when interpreting study findings. Because the study is cross sectional, participants were asked to report their drinking habits and alcohol-related negative consequences during the past year. Asking participants to recall their behavior from the past year may have resulted in overestimation or underestimation of their drinking behaviors. Relatedly, White, Kraus, McCracken, and Swartzwelder (2003) found that college students typically underestimated the size of a standard drink (e.g., 12 oz. beer) and therefore unknowingly underreported the amount of alcohol that they consumed in surveys. As a result, it may be possible that participants in the study underreported their use of alcohol within the past year.

A major limitation of the study relates to sample demographics. As described earlier, first year students (17 %) as well as male students (32%) were underrepresented in the research sample. The small number of these participants presented methodological challenges in conducting the multiple group tests of invariance associated with hypotheses eleven and twelve. Further, within the sample non-Caucasian students (47%)

and students who live on campus (37%) are overrepresented. The differences between the sample and the University at which the data was gathered should be considered when interpreting the findings of the study.

Limitations regarding the Drinking Motives Measure—Revised (DMM-R) as a measure of drinking motives deserves mention. Although the instrument has demonstrated strong reliability and validity in assessing drinking motives posited in the motivational model of alcohol use (Cooper, 1994; Martens, Rocha, et al., 2008), Cox and Klinger (2011) have argued that this instrument does not fully capture the four drinking motive categories. More specifically, these authors stated that drinking to enhance positive affect indirectly through the instrumental effects of alcohol (i.e., non-chemically) was not restricted to social motives and that drinking to reduce negative affect instrumentally had a "broader meaning than Cooper's conformity motives" (p. 137). It is possible that this limitation was the reason why the motivational model of alcohol use was not confirmed in the present study. Social norms variables explained only a small amount of variance in external drinking motives (1% of conformity motives and 5% of social reinforcement motives) and the association between the error terms of social reinforcement and conformity motives ($r = 0.29$) was significant, indicating that some of the unexplained variance in these variables was related. In the future, researchers may wish to revise the DMM-R so that the instrument more accurately defines and assesses external drinking motives among college students.

Implications

The findings from the present study on the role of perceived norms, alcohol outcome expectancies, and drinking motives in explaining alcohol use intensity and alcohol-related negative consequences hold important implications for the counseling profession. In the following section, study implications for both professional counselors and counselor educators will be discussed. An overview of how study findings can improve assessment and treatment approaches utilized by counselors will be provided. Further, I will describe how these findings may be infused within counselor training curricula by counselor educators. The section will conclude with a review of future research possibilities based on the current study findings.

Implications for Counselors

Counselors serving collegiate populations should consider incorporating the DMM-R into intake and screening procedures. Assessing drinking motives will enable clinicians to identify high-risk clients for treatment that is more intensive. Based on the study results, male students who endorse greater levels of drinking to cope and upperclassmen who report greater levels of conformity motives may be at increased risk for alcohol-related negative consequences. An advantage of assessing drinking motives in addition to asking direct questions about alcohol use intensity and alcohol-related negative consequences is that looking at results from these instruments together provides a more nuanced view of a client's drinking behavior. Higher levels of negative consequences may be the direct result of drinking to reduce negative affect or an indirect effect of drinking to enhance positive mood. Identifying these differences may help to

confirm diagnostic impressions related to the presence of a co-occurring mood or anxiety disorder. Assessing for specific drinking motives, as well as other psycho-social factors examined in this study, also provides additional clinical information that can be utilized to form a comprehensive treatment plan.

Assessing for drinking motives responds to the call within the literature to move away from a *one size fits all* approach and to develop tailored interventions that address the specific factors that are meaningful to the individual student (Carey et al., 2007; Cleveland et al., 2012). The findings of the study indicated that alcohol outcome expectancies are a significant predictor of negative and internal drinking motives. Accordingly, clients who present with high levels of these motives may benefit from a cognitive-behavioral approach that teaches them how to identify how outcome expectancies contribute to the cycle of alcohol abuse. Beck, Wright, Newman, and Liese (1993) provided a conceptual diagram that described how outcome expectancies influence drinking-related thinking and beliefs. These authors also outlined several strategies, such as the use of the daily thought record or behavioral monitoring, that counselors can employ during counseling to help clients alter drinking-related thoughts and behaviors. Didactic alcohol outcome expectancy challenge interventions also may be beneficial for college students who report internal or negative drinking motives. This intervention can be implemented in either group or individual counseling settings and has demonstrated promise in reducing rates of alcohol consumption among college students (Scott-Sheldon et al., 2012).

Assessing for perceived peer acceptance of high-risk drinking also may be advantageous for clinicians providing counseling with collegiate clients. Whereas injunctive social norms did influence drinking outcome variables as hypothesized, the variable also emerged as the most robust predictor of alcohol use intensity ($\beta = 0.41$). Given the importance of peer approval, assessing this construct may assist counselors in establishing a comprehensive plan of treatment. If a client reports higher levels of peer endorsement of hazardous drinking, a referral to a mutual support group such as Alcoholics Anonymous or SMART Recovery may be appropriate. DiClemente (2003) recognized the importance of establishing helping relationships as one of several behavioral processes that assist clients in progressing from preparing to change their substance use habits to maintaining a change once it has been made. Clients who perceive that their friends are accepting of behaviors such as daily drinking and driving while impaired may experience a greater struggle to identify or form relationships that support reduced drinking.

Implications for Counselor Educators

Given the most recent revisions of the accreditation guidelines by the Council for Accreditation for Counseling and Related Educational Programs (CACREP), counselor educators in CACREP accredited counseling programs can utilize the study results to help meet these new standards. According to CACREP (2009), all students, regardless of their specialty track, must demonstrate knowledge in the "theories and etiology of addictions and addictive behaviors, including strategies for prevention, intervention, and treatment" (Section II, G, 3, g.; p. 11). Based on the important roles that social norms,

alcohol outcome expectancies, and drinking motives played in explaining alcohol use intensity and alcohol-related negative consequences, counselor educators should consider including these theories when providing instruction on addiction etiology and maintenance among college-attending young adults. Further, with drinking motives accounting for a significant portion of the variance in drinking outcome variables, it is appropriate that counselor educators offer students who plan to work with this population training in counseling strategies that address motivation to change, such as motivational interviewing (Miller & Rollnick, 2002).

Many counselor-trainees participate in pre-practicum or practicum experiences that include providing direct counseling services to college student clients (Wester, 2010). Given the alarming rates of heavy episodic drinking and alcohol-related negative consequences reported by college students, it is critical that counselor educators inform their students of collegiate drinking theory and intervention approaches so that they can work effectively with this population. Based on study findings, counselor educators can instruct counselor-trainees on how to assess for not only alcohol-related negative consequences but also drinking motives. Incorporating these theories of collegiate drinking into client assessment also may assist counselor-trainees in developing their diagnostic and case conceptualization skills. Providing instruction on evidence-based cognitive-behavioral approaches to challenging alcohol outcome expectancies and addressing motivation to change also may benefit these students. More specifically, counselor-trainees planning to work with college students can be trained in a screening and brief intervention procedure, such as Brief Alcohol Screening and Intervention for

College Students (BASICS; Baer et al., 2001). Training in an intervention program such as BASICS will provide counselor-trainees with a "basic" set of cognitive, behavioral, motivational skills that they can use to address normative misperceptions, alcohol outcome expectancies, and motivation to change.

Implications for Future Research

The findings of the current research study present several avenues of future research in order to better understand how cognitive, motivational, and social determinants influence collegiate drinking. In the revised model, a majority of the variance in alcohol use intensity and alcohol-related negative consequences was unexplained. Adding constructs to the model that have demonstrated significant associations with collegiate drinking in past research studies, such as drinking refusal self-efficacy (Morawski & Oei, 2005) and parental injunctive norms (Neighbors et al., 2007), may increase the amount of explained variance in drinking outcomes. Further, using a more proximal reference group to assess descriptive social norms, such as same sex friends (Lewis & Clemens, 2008) rather than same sex typical student may improve the overall predictive ability of the path model.

An unexpected finding was that neither social norms variables significantly predicted conformity motives. This may have been due to the research sample; first-year students were underrepresented among participants. A closer examination, however, may reveal that differences in self-other discrepancies, or the difference between actual and perceived peer use, may moderate the relationship between descriptive social norms and conformity motives. It is possible that conformity motives are more likely to be endorsed

by students whose perception of alcohol use intensity by their peers is greater than their own actual reported alcohol use.

It may be informative to examine drinking motives using the AUDIT-C criteria for hazardous drinking vs. nonhazardous drinking as a grouping variable. A multiple group test of invariance between hazardous and low-risk drinkers may reveal differences in the magnitude and direction of the associations among alcohol outcome expectancies, social norms variables, drinking motives, alcohol use intensity, and alcohol-related negative consequences. Examining variations in drinking motives among these groups may further elucidate the relationship between social reinforcement drinking motives and collegiate drinking. Considering the evidence within the literature that these motives are more closely associated with low-risk alcohol use (Cooper, 1994), it is possible that social reinforcement drinking motives and alcohol use intensity possess a statistically significant relationship among students who do not meet AUDIT-C criteria for hazardous drinking.

The study results revealed clear patterns of alcohol use behavior based on specific drinking motives. Whereas enhancement motives were associated with alcohol use intensity, negative drinking motives were related to alcohol-related negative consequences. Researchers may utilize these findings to design and test tailored brief intervention programs. Students who endorse negative drinking motives would receive a more intensive intervention that incorporates personalized feedback on alcohol-related negative consequences and negative alcohol outcome expectancies. Students who endorse greater enhancement motives would receive an intervention that is more focused on

reducing their quantity and frequency of drinking by challenging positive alcohol outcome expectancies and facilitating the development of relationships that are supportive to reduced alcohol consumption. Further examination and development of the drinking motives measure as an assessment of the four categories of drinking motives described in the motivational model of alcohol use (Cox & Klinger, 1988, 2011) would be necessary before these interventions could be designed, compared, and tested.

Conclusion

The purpose of this study was to test an integrative model of collegiate drinking that incorporated multiple determinants of alcohol use behavior. Analysis of the results revealed that the revised model provided an acceptable fit for the data among both male and female students as well as underclassmen and upperclassmen in the sample, with few differences among these groups in the magnitude of variable associations. Tests of indirect effects indicated that drinking motives fully mediated the associations between positive alcohol outcome expectancies and drinking outcome variables. Further, drinking motives partially mediated the relationships among injunctive social norms, negative alcohol outcome expectancies, and drinking outcome variables. Distinct patterns of alcohol use behavior emerged between enhancement drinking motives and negative drinking motives; enhancement motives contributed to the prediction of alcohol use intensity, whereas negative drinking motives were key predictors of alcohol-related negative consequences. Future research is needed to examine model fit with other subpopulations of college students and to evaluate the utility of including additional constructs associated with collegiate drinking into the model. Overall, the findings of this

study hold important implications for assessing and treating problematic drinking among

college students. The incorporation of drinking motives into assessment and treatment

with college student drinkers may enhance prevention and intervention success.

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APPENDIX A

INFORMED CONSENT FORM

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO

CONSENT TO ACT AS A HUMAN PARTICIPANT: LONG FORM

Project Title: Perceived Norms, Alcohol Outcome Expectancies, Drinking Motives, and Collegiate Alcohol Use

Project Director: Dr. Todd Lewis

What is the study about?
This is a research project. The purpose of this study is to gather information regarding attitudes and behaviors of college students. You may refuse to participate or withdraw consent to participate in this study at any time. Your participation is voluntary. Should you feel uncomfortable at any time in this study it is your right to withdraw from the study without penalty or prejudice. After you complete the survey, you can raise your hand so the Student Researcher may collect your survey packet.

Why are you asking me?
We are asking you to participate because you are between the ages of 18 and 24 years old and are registered as a full-time student. Full-time enrollment status is defined as being enrolled in at least 12 credit hours during the semester. Persons cannot be in this study if they are older than 24 years old, younger than 18 years old, or a part-time student.

What will you ask me to do if I agree to be in the study?
You will be asked to complete a survey packet that takes about 10 minutes. Most questions ask you to report your attitudes and behaviors related to alcohol use. Some questions related to alcohol use may create feelings of psychological discomfort. If at any time, you feel uncomfortable it is your right to withdraw from it at any time without penalty or prejudice.

Is there any audio/video recording?
There will be no audio or video recording in this study.

What are the dangers to me?
The Institutional Review Board at the University of North Carolina at Greensboro has determined that participation in this study poses minimal risk to participants. You may feel uncomfortable answering questions about alcohol use. Should you feel uncomfortable at any time in this study it is your right to withdraw from the study without penalty or prejudice. If you would like to speak to a professional counselor regarding your alcohol use, please visit the Counseling and Testing Center (336-334-5340) located on the second floor of the Anna M. Gove Student Health Center or the Vacc Counseling and Consulting Clinic (336-334-5340) in located in 223 Ferguson Building. Furthermore, if you are below the minimum legal drinking age, by answering questions about illegal behaviors, you are at risk for legal trouble or discipline by UNCG. To minimize this risk, we are not requesting that you include your name or signature so that your survey packet

cannot be traced back to you.

If you have questions, want more information or have suggestions, please contact Edward Wahesh at 914-564-2926/e_wahesh@uncg.edu or Dr. Todd Lewis at 336-334-3422 or tflewis@uncg.edu. If you have any concerns about your rights, how you are being treated, concerns or complaints about this project or benefits or risks associated with being in this study please contact the Office of Research Compliance at UNCG toll-free at (855)-251-2351.

Are there any benefits to society as a result of me taking part in this research?
Research in this area may provide numerous benefits for college counselors and administrators in the development and implementation of high-risk drinking prevention for college students. Improved prevention programming may reduce the frequency and severity of alcohol-related negative consequences experienced by college students.

Are there any benefits to *me* for taking part in this research study?
There are no direct benefits to participants in this study. Participants may learn more about their attitudes about alcohol use by answering questions in the survey packet.

Will I get paid for being in the study? Will it cost me anything?
There are no costs to you or payments made for participating in this study.

How will you keep my information confidential?
We are not requesting that you include your name or signature so that your survey packet cannot be traced back to you. Completed survey packets will be stored in a secured file cabinet and the responses will be entered into an electronic, password-protected file on the University hard drive of the Principle Investigator. Should survey packet information be breached, survey data cannot be linked to you because we are not collecting your name or any other identifying information. All information obtained in this study is strictly confidential unless disclosure is required by law.

What if I want to leave the study?
You have the right to refuse to participate or to withdraw at any time, without penalty. If you do withdraw, it will not affect you in any way. If you choose to withdraw, you may request that any of your data which has been collected be destroyed unless it is in a de-identifiable state.

What about new information/changes in the study?
If significant new information relating to the study becomes available which may relate to your willingness to continue to participate, this information will be provided to you.

Voluntary Consent by Participant:
By partaking in this study you are agreeing that you read, and you fully understand the contents of this document and are openly willing consent to take part in this study. All of your questions concerning this study have been answered. By being part of this study, you are agreeing that you are 18 years of age or older and are agreeing to participate, or have the individual specified above as a participant participate, in this study described to you by Edward Wahesh.

APPENDIX B

RECRUITMENT SCRIPT

You are being asked to participate in a research study. The purpose of this study is to gather information regarding attitudes and behaviors of college students. We are asking you to participate because you are between the ages of 18 and 24 years old and are registered as a full-time student. Full-time enrollment status is defined as being enrolled in at least 12 credit hours during the semester. This statement and the Informed Consent Long Form that I have distributed describe the study to help you decide if you want to be part of the study.

We ask that you fill out a survey packet that takes about 10 minutes. Most questions ask you to report your attitudes and behaviors related to alcohol use. You may refuse to participate or withdraw consent to participate in this study at any time. Your participation is entirely voluntary. There are no payments made for participating in this study.

Some questions related to alcohol use may create feelings of psychological discomfort. If you decide to participate in this study, you will receive a handout that contains the contact information of two offices on campus that you can contact if you would like to discuss your use of alcohol. If you are below the minimum legal drinking age, by answering questions about illegal behaviors, you are at risk for legal trouble or discipline by UNCG. To minimize this risk, we are not requesting that you include your name or signature so that your survey packet cannot be traced back to you.

Your privacy will be protected as you will not be identified by name as a participant in this study. Further, all information obtained in this study is strictly confidential unless disclosure is required by law.

If you decide to participate, I will provide you with a survey packet to complete. After you have finished, please place the survey packet in the envelope provided and raise your hand.

If you have any questions, thoughts, or concerns please share them now and/or while you complete the survey packet. In addition, if you are curious about the study or would like to contact myself (Edward Wahesh, Doctoral Student in the Department of Counseling and Educational Development at UNCG) or my advisor, Dr. Todd Lewis, Associate Professor in the Department of Counseling and Educational Development at UNCG about any questions you might have, our contact information is listed on the sheet of paper that will be handed out to you titled "CONSENT TO ACT AS A HUMAN PARTICIPANT: LONG FORM." Thank you.

APPENDIX C

PILOT STUDY FEEDBACK FORM

Please complete this short form when you finish the survey packet. Note any changes that you see would make the process better. Your feedback is very helpful.

1) How long did it take you to complete the surveys?   _____

2) Were the instructions clear and easy to follow? If no, please explain:

_____

_____

_____

_____

3) If any questions were difficult to understand, please comment and state which page of the survey they were located.

_____

_____

_____

_____

4) Do you have any further thoughts on ways to improve the study?

_____

_____

APPENDIX D

SURVEY PACKET

Survey Packet

Today's Date:

This questionnaire assesses what you would expect to happen if you were under the influence of alcohol. Choose 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 on the amount of alcohol you typically consume. Circle one answer from the numbers after each statement.

If I were under the influence from drinking alcohol:	Disagree	Slightly Disagree	Slightly Agree	Agree
1. I would be outgoing	1	2	3	4
2. My senses would be dulled	1	2	3	4
3. I would be humorous	1	2	3	4
4. My problems would seem worse	1	2	3	4
5. It would be easier to express my feelings	1	2	3	4
6. My writing would be impaired	1	2	3	4
7. I would feel sexy	1	2	3	4
8. I would have difficulty thinking	1	2	3	4
9. I would neglect my obligations	1	2	3	4
10. I would feel dominant	1	2	3	4
11. My head would feel fuzzy	1	2	3	4
12. I would enjoy sex more	1	2	3	4
13. I would feel dizzy	1	2	3	4
14. I would be friendly	1	2	3	4
15. I would be clumsy	1	2	3	4
16. It would be easier to act out my fantasies	1	2	3	4
17. I would be loud, boisterous, or noisy	1	2	3	4
18. I would feel peaceful	1	2	3	4
19. I would feel brave and daring	1	2	3	4
20. I would feel unafraid	1	2	3	4
21. I would feel creative	1	2	3	4
22. I would feel courageous	1	2	3	4
23. I would feel shaky or jittery the next day	1	2	3	4
24. I would feel energetic	1	2	3	4
25. I would act aggressively	1	2	3	4
26. My responses would be slow	1	2	3	4
27. My body would be relaxed	1	2	3	4
28. I would feel guilty	1	2	3	4
29. I would feel calm	1	2	3	4
30. I would feel moody	1	2	3	4
31. It would be easier to talk to people	1	2	3	4
32. I would be a better lover	1	2	3	4
33. I would feel self-critical	1	2	3	4
34. I would be talkative	1	2	3	4
35. I would act tough	1	2	3	4
36. I would take risks	1	2	3	4
37. I would feel powerful	1	2	3	4
38. I would act sociable	1	2	3	4

How would your friends feel if you:

Drank alcohol every weekend

1	2	3	4	5	6	7
Strong Disapproval	Moderate Disapproval	Mild Disapproval	Wouldn't Care	Mild Approval	Moderate Approval	Strong Approval

Drank alcohol daily

1	2	3	4	5	6	7
Strong Disapproval	Moderate Disapproval	Mild Disapproval	Wouldn't Care	Mild Approval	Moderate Approval	Strong Approval

Drove a car after drinking

1	2	3	4	5	6	7
Strong Disapproval	Moderate Disapproval	Mild Disapproval	Wouldn't Care	Mild Approval	Moderate Approval	Strong Approval

Drank enough alcohol to pass out

1	2	3	4	5	6	7
Strong Disapproval	Moderate Disapproval	Mild Disapproval	Wouldn't Care	Mild Approval	Moderate Approval	Strong Approval

For the following questions about drinking, please keep in mind that for our purposes, one drink equals: one 12 oz. beer, or one 5 oz. glass of wine, or one 12 oz. wine cooler, or one 1 ½ oz. shot of liquor or one mixed drink containing 1 shot of liquor.					
1. How often do you think a typical student of the same sex at your university has a drink containing alcohol?	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week
2. How many drinks containing alcohol do you think a typical student of the same sex at your university has on a typical day when drinking?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more
3a. How often do you think a typical **female** student at your university has 4 or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
3b. How often do you think a typical **male** student at your university has 5 or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily

Have you consumed alcohol in the past year?

- ☐ Yes, within the past 30 days
- ☐ Yes, *but not* within the past 30 days
- ☐ No, I have not consumed alcohol within the past year

Thinking of all the times you drink, how often would you say that you drink for each of the following reasons? If you do not drink, we would like to know how important each reason would be to you if you were to start drinking.	Almost never/ Never	Some of the time	Half of the time	Most of the time	Almost always/ Always
1. To forget your worries	1	2	3	4	5
2. Because your friends pressure you to drink	1	2	3	4	5
3. Because it helps you enjoy a party	1	2	3	4	5
4. Because it helps you when you feel depressed or nervous	1	2	3	4	5
5. To be sociable	1	2	3	4	5
6. To cheer up when you are in a bad mood	1	2	3	4	5
7. Because you like the feeling	1	2	3	4	5
8. So that others won't kid you about not drinking	1	2	3	4	5
9. Because it's exciting	1	2	3	4	5
10. To get high	1	2	3	4	5
11. Because it makes social gatherings more fun	1	2	3	4	5
12. To fit in with a group you like	1	2	3	4	5
13. Because it gives you a pleasant feeling	1	2	3	4	5
14. Because it improves parties and celebrations	1	2	3	4	5
15. Because you feel more self-confident and sure of yourself	1	2	3	4	5
16. To celebrate a special occasion with friends	1	2	3	4	5
17. To forget about your problems	1	2	3	4	5
18. Because it's fun	1	2	3	4	5
19. To be liked	1	2	3	4	5
20. So you won't feel left out	1	2	3	4	5

For the following questions about drinking, please keep in mind that for our purposes, one drink equals: one 12 oz. beer, or one 5 oz. glass of wine, or one 12 oz. wine cooler, or one 1 ½ oz. shot of liquor or one mixed drink containing 1 shot of liquor.					
Questions					
1. How often do you have a drink containing alcohol?	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	0, 1, or 2	3 or 4	5 or 6	7 to 9	10 or more
3a. **For women**, How often do you have 4 or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
3b. **For men**, How often do you have 5 or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily

Brief Young Adult Alcohol Consequences Questionnaire

Please indicate (Yes/No) if the following has occurred to you during the <u>past year</u>.

1.	While drinking, I have said or done embarrassing things.	Yes	No
2.	I have had a hangover (headache, sick stomach) the morning after I had been drinking.	Yes	No
3.	I have felt very sick to my stomach or thrown up after drinking.	Yes	No
4.	I often have ended up drinking on nights when I had planned not to drink.	Yes	No
5.	I have taken foolish risks when I have been drinking.	Yes	No
6.	I have passed out from drinking.	Yes	No
7.	I have found that I needed larger amounts of alcohol to feel any effect, or that I could no longer get high or drunk on the amount that used to get me high or drunk.	Yes	No
8.	When drinking, I have done impulsive things I regretted later.	Yes	No
9.	I've not been able to remember large stretches of time while drinking heavily.	Yes	No
10.	I have driven a car when I knew I had too much to drink to drive safely.	Yes	No
11.	I have not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking.	Yes	No
12.	My drinking has gotten me into sexual situations I later regretted.	Yes	No
13.	I have often found it difficult to limit how much I drink.	Yes	No
14.	I have become very rude, obnoxious, or insulting after drinking.	Yes	No
15.	I have woken up in an unexpected place after heavy drinking.	Yes	No
16.	I have felt badly about myself because of my drinking.	Yes	No

17. I have had less energy or felt tired because of my drinking.	Yes	No
18. The quality of my work or schoolwork has suffered because of my drinking.	Yes	No
19. I have spent too much time drinking.	Yes	No
20. I have neglected my obligations to family, work, or school because of drinking.	Yes	No
21. My drinking has created problems between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives.	Yes	No
22. I have been overweight because of drinking.	Yes	No
23. My physical appearance has been harmed by my drinking.	Yes	No
24. I have felt like I needed a drink after I'd gotten up (that is, before breakfast).	Yes	No

What is your year in school? (Circle one option)

☐ 1st year undergraduate
☐ 2nd year undergraduate
☐ 3rd year undergraduate
☐ 4th year undergraduate
☐ 5th year or more undergraduate
☐ Graduate or professional
☐ Not seeking a degree
☐ Other:

Current student status (circle):   Full time   Part time   Other

Gender (circle):   Male   Female   Other

What is your age? _____

How do you usually describe yourself? (Check all that apply):

☐ White (Non-Hispanic)
☐ Black/African American/Caribbean
☐ Hispanic or Latino/a
☐ Asian or Pacific Islander
☐ American Indian, Alaska Native, or Native Hawaiian
☐ Biracial or Multiracial   ☐ Other:

Where do you currently live?

☐ Campus residence hall
☐ Residential college/learning community on campus
☐ Fraternity or sorority house
☐ Other college/university housing
☐ Parent/guardian's home
☐ Other off-campus housing
☐ Other:

Are you a member of a social fraternity or sorority? Yes No

Within the last 12 months, have you participated in organized college athletics at any of the following levels?

Varsity Yes No

Club Sports Yes No

Intramurals Yes No

What is your approximate cumulative grade point average?
☐ A
☐ B
☐ C
☐ D/F
☐ N/A

At what age did you first use alcohol (beyond just a sip)?
☐ Have not used
☐ Under 10
☐ 10-11
☐ 12-13
☐ 14-15
☐ 16-17
☐ 18-20
☐ 21-25
☐ 26+

Think back over the last <u>two weeks</u>. How many times have you had five or more drinks at a sitting? A drink is a bottle of beer, a glass of wine, a wine cooler, a shot glass of liquor, or a mixed drink.

- ☐ None
- ☐ Once
- ☐ Twice
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 or more times

Within the <u>past year</u>, have you been cited for alcohol use by police or campus authorities?

- ☐ Yes
- ☐ No

What is the highest level of formal education attained by your parents?

Mark <u>one</u> in each column	Father	Mother
High school or less		
Some college		
College degree		
Some graduate school		
Graduate degree		

Have any of your family had alcohol or other drug problems? (Check all that apply)

- ☐ Mother
- ☐ Father
- ☐ Stepmother
- ☐ Stepfather
- ☐ Brothers/sisters
- ☐ Mother's parents
- ☐ Father's parents
- ☐ Aunts/uncles
- ☐ Spouse
- ☐ Children
- ☐ None