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College student alcohol abuse has been described by the U.S. Surgeon General as the most significant public health concern on college and university campuses (DHHS, 2007). The consequences of problematic drinking perpetrated by college age students are varied, serious, damaging, and far reaching; the misuse of alcohol that many students engage in makes them more susceptible to a myriad of other negative consequences including sexual assault, bodily injury, alcohol poisoning, vandalism, sleep disturbances, and unintentional death (Dowdall, 2009; Wechsler & Wuethrich, 2002; White & Rabiner, 2012). Approximately 31% of college students meet DSM-IV criteria for alcohol abuse and another 6% meet criteria for alcohol dependence (Knight et al., 2002).

Based on the existing literature and current trends in university prevention efforts, social norms theory has offered an innovative approach to college student drinking that highlights moderate drinking behaviors in an effort to correct misperceptions about heavy peer drinking (Berkowitz, 2004; Perkins & Berkowitz, 1986). Social norms have been identified as a strong predictor of college drinking behavior and yet the approach has limited effectiveness in changing drinking behavior in students (Bonday & Bruce, 2003; Neighbors, Lostutter, et al., 2007; Thombs, Dotterer, Olds, Sharp, & Raub, 2004). The limited effectiveness of current approaches to address

college drinking indicate a gap in knowledge about best practices for this concern and a need to explore new theoretical constructs to further explain and address problematic drinking in collegians.

A possible theoretical construct to lend additional explanation for problematic drinking is the Health Belief Model (Rosenstock, 1966). Thus, the purpose of this study is to explore the relationships among social norms, health beliefs, and problematic drinking among college students. It is possible that personal health beliefs may influence students' decisions about drinking, in addition to their perceptions about how much and how often their peers consume alcohol. It is important to research a health theory that is designed to understand individual behavioral choices based on how they impact health and the possibility that this extends and mediates the already established relationship between social norms theory and problematic drinking behavior.

COLLEGE STUDENT ALCOHOL USE AND ABUSE: SOCIAL NORMS, HEALTH BELIEFS, AND
SELECTED SOCIO-DEMOGRAPHIC VARIABLES AS EXPLANATORY FACTORS

by

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CHAPTER I

INTRODUCTION

The breadth, depth, and reach of problematic alcohol consumption are national concerns, especially among colleges and universities (Dowdall, 2009; Wechsler & Wuethrich, 2002). Despite massive efforts at prevention and remediation, college student drinking remains the #1 health issue on college campuses. Clearly, new methods and approaches to prevention and intervention are needed. In this chapter, a brief review of statistics on alcohol consumption and the consequences of collegiate drinking are provided to underscore the scope of the problem. Social norms theory, the most prevalent theory applied to the problems of collegiate drinking, is described and limitations of this theory are discussed. The potential usefulness of the health belief model (HBM) as an adjunct to social norms theory is described, based on research using the HBM in health care and community settings. The integration of research on the dynamics of collegiate drinking, application of social norms theory, and the potential integration of the HBM is presented in a succinct statement of the problem followed by a discussion of the purpose of the study and presentation of the research questions. The chapter concludes with definitions of key terms and an overview of the remaining chapters.

Collegiate Drinking: Scope of the Problem and Consequences

Whereas underage drinking in general poses a significant health risk to young people in the United States, excessive alcohol use and associated problems on college campuses have garnered substantial attention from government agencies and researchers, especially in recent years. In 2002 the National Institute of Health's task force of the national advisory council on alcohol abuse and alcoholism issued a call to action recommending a 4-tier framework of recommendations for colleges and universities, as well as recommendations for the research community (NIH, 2002). In 2007, the Surgeon General and U.S. Department of Health and Human Services (DHHS) released a call to action to prevent and reduce underage drinking, with an emphasis on college campuses. In 2009, the Center for the Study of Collegiate Mental Health released pilot study data on the scope of mental health issues affecting university communities, including alcohol and substance abuse. It was discovered that serious mental health issues were frequently associated with alcohol and other drug use.

Clearly, the problem of alcohol abuse on college campuses has been the subject of intense study by a number of government agencies and researchers. One of the most comprehensive studies of college alcohol use is the College Alcohol Study (CAS), headed by Henry Wechsler at the Harvard School of Public Health. The CAS began in 1992 and ended 14 years later in 2006 after 4 rounds of national surveys designed to "provide a representative picture of college student alcohol use and to describe the drinking behavior of this high risk group" (Wechsler & Nelson, 2008, p. 481). Data from the CAS

provides much insight into the prevalence and consequences of collegiate alcohol consumption.

The prevalence of problematic drinking among college populations has remained stable across two decades, indicating that the problem is not being addressed adequately by current prevention and intervention efforts (Wechsler & Nelson, 2008; Wechsler & Wuethrich, 2002). During the first CAS study, researchers found that 44% of students attending 4-year universities engaged in binge drinking (defined as 4 or more drinks in a row for women or 5 or more drinks in a row for men). The levels of binge drinking remained stable in all 4 of the administrations of the CAS from 1993 to 2001 (Wechsler & Nelson, 2008). The findings of the CAS (related to binge drinking rates) have been supported by other national research projects such as the Monitoring the Future Study (Johnston, O'Malley, Bachman, & Schulenberg, 2010), the CORE survey (Presley & Meilman, 1994), and the National Youth Health Risk Behavior Survey (Centers for Disease Control [CDC], 2009).

The CAS is the most widely used method of gathering data specifically about alcohol use behaviors among traditional-aged college students. Across the 4 administrations, nearly half of student respondents to the CAS reported using alcohol, and a relatively large number of students (48%) reported that drinking to get drunk is an important reason and goal to consume alcohol, something that is great cause for concern according to Wechsler and Nelson (2008). Almost a quarter (23%) of students

reported drinking 10 or more times in a month, and 29% were intoxicated 3 or more times monthly (Wechsler & Nelson, 2008).

The consequences of heavy drinking can be more serious than the consequences for non-heavy alcohol use. Students who do not engage in problematic drinking may nevertheless be affected by the behaviors of those students who do binge drink, in that they share an academic and social environment. Indeed, what is probably most disconcerting about the high rates of deleterious drinking are the numerous consequences that often result. The type, nature, and prevalence of common consequences that result from heavy collegiate drinking are described below.

The consequences of problematic drinking perpetrated by college age students are varied, serious, damaging, and far-reaching. They encompass areas such as mental and emotional well-being, academic performance, relationships between the local community and campus, negative physiological effects, vandalism, and property damage, and sexual assault (Grant, 1997; Rutledge, Park, & Sher, 2008; Wechsler & Nelson, 2008; Wechsler & Wuethrich, 2002). The Center for the Study of Collegiate Mental Health (CSCMH, 2009) conducted a pilot study in 2009 to gather information about the range of mental health issues affecting college students. The CSCMH reported that students who scored high on a substance abuse subscale also had significantly higher levels of depression (especially male students) and that over half of the students who reported 10 or more episodes of binge drinking in the past two weeks had seriously considered suicide (CSCMH, 2009).

The alcohol problems on college campuses do not only affect individuals affiliated with the university. One university president quoted in the NIH Call to Action (2002) commented on how problematic drinking on campus damages “town and gown” relationships; or how student drinking behaviors negatively impact not only the university community, but the area surrounding the university and the people who live in those neighborhoods.

Academic performance also was found to have a negative relationship with binge drinking, as evidenced by student reports of GPA and academic distress scores (CSCMH, 2009). The link between academic failure and binge drinking has been longstanding. “Binge drinkers are more likely to miss classes, fall behind in schoolwork, and to have poor or failing grades than students who drink but do not binge” (Wechsler & Wuethrich, 2002, p. 19). Wechsler and Wuethrich also found that students who engaged in binge drinking spent less time studying each day.

The physical consequences of consuming too much alcohol include hangovers, injury from physical altercations involving intoxicated individuals, and more serious problems such as unintentional death due to alcohol poisoning, respiratory arrest, and asphyxiation.

Women may be particularly vulnerable to the emotional and sexual health consequences of excessive drinking (Wechsler & Wuethrich, 2002). Women who took part in the CAS reported drinking enough to black out, being sexually assaulted, and not being aware of the sexual assault until informed by a friend of what happened. Women

further reported damaged self-esteem resulting from sexual activities that normally would not have happened. There also is evidence that college women who display impulsivity in terms of binge drinking may be struggling with body image concerns. Women reported not eating before going out in order to save their calories for the alcohol, which invariably enhances the alcohol's effect (Wechsler & Weuthrich, 2002).

Clearly, heavy alcohol use and associated consequences represent tremendous challenges across college and university campuses. As a result, researchers have increasingly sought to explain collegiate drinking behavior through the lens of theory. One of the most prominent theories used to explain collegiate drinking is social norms theory. Social norms theory has been shown to be a robust predictor of collegiate drinking (Thombs, 2000). Given its central role in explaining collegiate drinking across numerous empirical studies, a description of social norms theory, including strengths and limitations, is presented next.

Social Norms Theory

Social norms theory was first posited in 1986 by H. Wesley Perkins and Alan Berkowitz to analyze student alcohol use patterns (Berkowitz, 2004; Perkins & Berkowitz, 1986). The theory has been studied widely (Carter & Kahnweiler, 2000; Haines & Spear, 1996; Larimer, Irvine, Kilmer, & Marlatt, 1997; Neal & Carey, 2004; Steffian, 1999; Thombs, 2000; Wood, Hevey, Laird, Stevenson, & Mitchell, 2000) to examine and correct normative misperceptions about peer drinking behavior among the college population. In essence, the approach is used as a ruler to reassure students that

their peers are not drinking nearly as much as they perceive them to be, thus they can let down their guards of feeling the need to keep up with others or outpace their consumption. The researchers found that students consistently overestimated the amount of alcohol that their peers were consuming and the extent to which their friends were supportive of excessive drinking behavior (Berkowitz, 2004). Pervasive overestimation of alcohol consumption was found to be predictive of how much individuals drank as students sought to keep pace with what they believed their peers to be doing (Perkins & Berkowitz, 1986).

Social norms theory was well-received by universities and other entities seeking to address college drinking because of the fresh approach it proposed. At that time, the accepted methods for managing student abusive drinking behavior were educational programs or messages designed to induce fear about the dangers and consequences of abusive drinking (Schultz, Nolan, Cialdina, Goldstein, & Griskevicius, 2006). Perkins and Berkowitz (1986) proposed a model that highlighted the healthy norms of the majority of students on campus. As such, an effort was made to increase these by using information about healthy norms to intervene with alcohol abusers by disproving the need to keep pace with a faulty perception of drinking (Berkowitz, 2004).

Several different types of norms exist, as well as differences among the types of misperceptions that students hold. Descriptive social norms are the “perception of others’ quantity and frequency of drinking based largely on observations of how people consume alcohol in discrete drinking situations” (Borsari & Carey, 2003, p. 331).

Injunctive social norms relate to “perceived approval of drinking, represent[ing] perceived moral rules of the peer group” (Borsari & Carey, 2003, p. 331). Proximal social norms are those that indicate nearness or closeness of the friend groups and use wording such as “best friend” (Berkowitz, 2004) while distal social norms are on the opposite end of the spectrum and signify being remote or removed from the friend group that the student identifies with. The most common misperception that students have about peer drinking behavior is pluralistic ignorance, or wrongly believing that the majority of one’s peers behave or think differently from them when in actuality their attitudes are very alike (Miller & McFarland, 1987, 1991; Prentice & Miller, 1996; Toch & Klofas, 1984). Conversely, false consensus refers to an incorrect assumption that others are like oneself when in reality they are not (Ross, Greene, & House, 1977). False uniqueness, the last of the misperceptions, occurs when “the perception that one’s position or attributes are more uncommon than is actually the case” (Suls & Wan, 1987, p. 211). Students who feel they are in a drinking minority on campus, such as abstainers, often fall to this particular misperception.

Taken in concert, the study of social norms and student misperceptions has helped researchers and college administrators to use this information to design media campaigns that address the misinformation students hold and hopefully affect behavior change. However, mistrust of information in campaigns, including students finding media messages as deceptive tactics to curb their fun college experience, as well as being intentionally misleading have all been barriers that researchers have faced when

implementing social norms campaigns on campuses (DeJong et al., 2006, 2009; Schultz et al., 2006; Scribner et al., 2011). The addition of another theory that appeals to more personal health decisions may be a useful way to focus students on their individual alcohol use instead of deflecting messages that represent their student community as a whole. The social norms approach has been useful in conceptualizing drinking behavior among collegians and is a consistently strong explanatory variable for drinking intensity; however, the application of social norms theory to reduce or change drinking behaviors has been met with mixed results (Clapp, Russell, & DeJong, 2001; Fabiano, 1999; Granfield, 2002). One reason for this is that when data is gathered about peer norms and then presented to students (i.e., a common approach in social norm campaigns to reduce drinking) it does not fully capture their own thoughts and beliefs about drinking behavior as much as it represents a composite of the general student body's perception. That is, social norms theory is limited in that it refers to students' perceptions of others but does not include specific, personal thoughts about drinking behavior, consequences, and health risks, which could add additional explanation to college student drinking. Adding the health belief model (HBM), which focuses on individual beliefs about drinking behavior and its effect on health seems to be a logical theory that can integrate and further explain the connection between social norms and college student drinking. The components of the health belief model are presented next.

Health Belief Model

The Health Belief Model (HBM) is a theory developed by social psychologists to understand the under-utilization of preventative screenings and approaches that could serve to improve the health of populations (Janz, Champion, & Strecher, 2002). The HBM was originally conceptualized in the 1950s by Irwin Rosenstock (1966). Hochbaum, Kegels, and Becker later joined Rosenstock in refining the model's concepts. During the 1950s, healthcare in the U.S. was moving from a reactive, treatment-based system to a more proactive prevention-centered approach. More preventive screenings, such as chest x-rays for tuberculosis, were available than in previous years. Despite increasing technology making such screenings available, people were not participating in preventative health screenings at the rate that public health educators were promoting health-enhancing practices. After reviewing studies by Hochbaum (1958) and Kegels (1963), Rosenstock noticed a trend in the thought processes of individuals who did choose to participate in preventive health measures. He saw that only those who felt personally susceptible to the conditions described sought screenings. An assumption of the HBM is that in order for a person to take a recommended action for health improvement, that person must feel personally vulnerable to the illness or condition for which she is being asked to take action against (Fishbein, 2009).

The health belief model is a value-expectancy theory. "Value-expectancy theories deal with the influence of individual values and expectations on behavior and/or the development of these values and expectations" (Hays, 1985, p. 379). The

original HBM has four main components: perceived susceptibility, perceived severity, benefits, and barriers. The concept of perceived susceptibility addresses an individual's answer to the question 'Will I get it?' whereas perceived severity speaks to the individual's thoughts about the question 'How dangerous is it?' The combination of perceived susceptibility and perceived severity forms a composite theoretical concept termed perceived threat. The benefits portion of the HBM is described as views on how helpful taking a recommended health action is on personal health and wellness. Barriers are comprised of opinions about the negative aspects or costs associated with taking the health action.

Statement of the Problem

The problem of college drinking has been observed by both national agencies of health down to individual community members living near campuses. Current methods of intervention have had limited success in encouraging students to drink more moderately, even when the intervention method is based on sound theoretical concepts. The social norms theory has been widely used to address the problems of collegiate drinking but with limited success. The Health belief model, a widely used model successfully applied to a myriad of health care problems, shows promise as a means of intervention with college student populations. To date, the HBM has not been applied to the problem of college student drinking, nor has it been used in concert with the more popular social norms theory. Further, the relationship between college student drinking, social norms, and health beliefs has never been examined.

Purpose of the Study

The purpose of this study is to address a significant gap in the collegiate alcohol use literature by exploring the relationships among social norms, health beliefs, and problematic drinking among college students. A primary goal is to assess the ability of social norms and health beliefs combined to predict problematic drinking behavior among college students. Given the possibility that health beliefs may explicate the mechanism that underlies the relationship between social norms and problematic drinking, it also is important to examine the possible mediating effects of health beliefs on the relationship between social norms and problematic drinking.

Research Questions

Four main research questions will provide the direction and focus for this study.

RQ1. What are the relationships among (a) social norms, (b) health belief components and (c) problematic drinking among a sample of college students?

RQ1a: What is the relationship between social norms and problematic drinking among a sample of college students?

RQ1b: What is the relationship between health belief components and problematic drinking among a sample of college students?

RQ2: Do social norms and health belief components predict a significant amount of variance in problematic drinking among a sample of college students?

RQ3: Do social norms and health belief components predict a significant amount of variance in problematic drinking above and beyond selected socio-demographic

variables known to be associated with college drinking among a sample of college students?

RQ4: Do the components of the health belief model mediate the relationship between social norms and problematic drinking among a sample of college students?

Significance of the Study

Given the frequency of heavy drinking and associated consequences among college students, it is imperative to understand theoretically based variables that lead to these problematic behaviors. Heavy drinking can result in a myriad of negative consequences impacting the student's personal, social, and academic functioning. Social norms theory is an empirically established model of drinking, but fails to address individual perceptions about health behavior, which can potentially impact health decisions, such as whether or not to engage in problematic drinking. The incorporation of health beliefs in relation to problematic drinking will be a significant addition to the collegiate alcohol literature; no study to date has looked at how a student's beliefs about alcohol and its effect on their health and wellness guide drinking behavior, nor how these beliefs combine with social norms to better explain problematic drinking among college students. Consequently, this study has potential to be a first step in the development of an empirical model of problematic drinking based on an integration of social norms theory and the health belief model.

Need for the Study

Given the rise in general mental health concerns among college students and the likelihood of these mental illnesses co-occurring with substance use disorders (CSCMH, 2009, SAMHSA, 2012) there exists a need to develop new methods for addressing collegiate substance abuse, especially methods that integrate theory. As the rates of heavy drinking on college campuses continue to remain high (Wechsler & Wuethrich, 2002), research that integrates theory can potentially provide greater explanation of problematic drinking, leading to more precise interventions. The current trend in interventions to reduce college student drinking behavior include the social norms approach of gathering normative data and using media campaigns to challenge misperceptions. A missing link in these interventions may include addressing individual health beliefs that college counselors, in particular, can integrate into already existing social norm interventions. If it can be shown that a relationship exists between social norms, health beliefs, and problematic drinking among college students, then counselors will be able to use this information to design effective interventions against the consequences of problematic drinking among college students. This study is needed to potentially provide counselors and researchers with new direction for integrating individual beliefs into social norms campaigns to increase the effectiveness of these programs.

Definition of Terms

The terms used in this study relate to social norms theory, the health belief model, and drinking behaviors. They include *social norms*, *quantity norms*, *frequency norms*, *health beliefs*, *perceived susceptibility*, *perceived severity*, *perceived benefits*, *perceived barriers*, and *problematic drinking*.

Social norms are the perceptions that students hold about how much or how often an average student from a particular reference group on campus drinks (also called descriptive norms). *Quantity norms* refer to how much a reference group drinks on a typical weekend. *Frequency norms* refer to how often a reference group drinks.

The construct of *health beliefs* adopted for this study is defined as perceptions according to the health belief model. The health belief model (Rosenstock, 1966) concept of *perceived susceptibility* is defined as an individual's beliefs about how predisposed they are to being diagnosed with a particular medical condition. *Perceived severity* is defined as an individual's personal assessment of the severity of a condition. *Perceived benefits* are defined as beliefs about how effective engaging in certain preventative behaviors would be in reducing the risk of being diagnosed with a particular illness. For example, if a student were to believe that reducing the number of drinks consumed in one sitting at a party from six to three would significantly decrease their probability of being diagnosed with an alcohol use disorder, reducing the amount of alcohol intake would be considered a perceived benefit. *Perceived barriers* are the opposite of benefits, in that they are defined as representing any obstacle or difficulty

one might encounter when contemplating engaging in a protective behavior. If a student were to feel that a reduction of drinking would impede his ability to be social at a party, or would result in ridicule from peers, the likelihood of reduced drinking decreases; in essence, the negative fallout from not drinking is an example of a perceived barrier to adopting healthier drinking habits.

Problematic drinking will be defined as the point at which alcohol use has become hazardous to one's health, as defined by the Alcohol Use Disorders Identification Test (AUDIT).

Organization of the Study

The current study will be presented in five chapters. The current chapter gives details about the purpose of the study and provides operational definitions for terms that will be used throughout the manuscript. Chapter II provides an overview of the bodies of literature related to college student alcohol use and abuse as well as more in-depth discussion of the two theoretical foundations for the study. In Chapter III, I outline the research questions used to guide the study as well as the methodology and data analyses that will be used. Chapter IV presents the results for the current study and findings for each research question. Finally, Chapter V concludes in a discussion of the results and implications for future research based on findings.

CHAPTER II

REVIEW OF THE LITERATURE

In Chapter I, the rationale for a study of the relationships between social norms, health beliefs, and problematic drinking among was presented. In this chapter, definitions and prevalence of collegiate alcohol use are described. Socio-demographic and psychosocial variables known to be indicative of problematic drinking patterns among students will be discussed. Categories used to distinguish college drinkers and the consequences of alcohol use and abuse among collegians are reviewed. An overview of student perceptions about alcohol and the beliefs, expectancies, and motives for drinking will be provided. The Social Norms Theory and Health belief model are described and research related to these models is presented and analyzed, with a particular focus on college student drinking. Finally, ways in which these two models can further understanding of the relationships among college students' beliefs about drinking, alcohol expectancies, and motives for drinking are integrated in the literature review and summarized at the end of the chapter. The chapter concludes with a summary which underscores the need for a study of the relationships among trends in collegiate alcohol use, social norms, and health beliefs.

Trends in Collegiate Alcohol Use

Trends of problematic alcohol use among college students have remained stable for the past decade despite institutional and government awareness of the problem and college students consistently report of higher rates of drinking, binge drinking, and heavy alcohol use in comparison to their same age peers (DHHS, 2007; SAMHSA, 2010). Understanding current trends in college alcohol use give us a baseline by which we can gauge the effectiveness of new interventions aimed at addressing the problematic drinking that occurs on campuses nationwide. To better understand the incidence of alcohol use among college students, the definition of abuse, dependence, binge and heavy episodic drinking are first presented. Socio-demographic and psychosocial factors of problematic drinking in college students are discussed to better understand factors that contribute to alcohol abuse in this population. Commonly used paradigms for categorizing drinkers and the consequences of alcohol use are described next to provide a foundation for the discussion that follows on alcohol beliefs, expectancies, and motives for drinking among students.

Definitions

A variety of definitions pertinent to the study of collegiate alcohol abuse have been described in the literature. These definitions underscore the spectrum of possible drinking behaviors that may be found among college students. They include the *Diagnostic and Statistical Manual* definitions of alcohol abuse, dependence, and descriptions in the literature of binge drinking and heavy episodic drinking.

The *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision [DSM IV-TR] (APA, 2000) defined substance *abuse* as a “maladaptive pattern of substance use manifested by recurrent and significant adverse consequences related to the repeated use of substances” (p. 198). In order to receive a diagnosis of alcohol abuse, an individual must exhibit one or more of these four criteria: (a) failure to fulfill a major role obligation because of drinking (e.g. missing several classes due to being hung over); (b) continuing to drink even in physically hazardous situations (such as when operating a vehicle); (c) being arrested for drinking or misconduct while drinking; and (d) continued drinking despite social/interpersonal problems caused by drinking. Substance abuse is a pattern of behavior that denotes an inappropriate use of a drug or chemical, despite serious consequences. Substance abuse that is not addressed may potentially develop into a more serious condition classified by a physiological (physical withdrawal symptoms) or psychological (emotional pain) need for a substance known as substance dependence (Najavits, Weiss, Shaw, & Muenz, 1998).

Dependence on a substance is defined as a “cluster of cognitive, behavioral, and physiological symptoms indicating that the individual continues use of the substance despite significant substance related problems” (DSM-IV-TR, 2000, p. 192). To meet the diagnostic threshold for an alcohol dependence diagnosis, an individual must meet three or more of the following seven criteria: (a) tolerance; (b) withdrawal; (c) drinking alcohol in larger amounts/over a longer period than was intended; (d) unsuccessful efforts to cut down drinking; (e) great deal of time spent obtaining, using, or recovering

from drinking; (f) important social/work/recreational activities reduced because of drinking; and (g) continued drinking despite physical or psychological problems that result (APA, 2000).

Dependence on alcohol is a potentially life-threatening condition that can require both medical treatment (e.g. psychopharmacological treatments, detoxification procedures to provide a safe, medical withdrawal or stomach pumping to prevent alcohol poisoning after binge drinking) as well as mental health treatment (e.g. individual and/or group counseling; Anton et al., 2006). Counseling approaches are designed to identify and address underlying motives and provide new coping strategies for individuals engaging in problematic drinking (Anton et al., 2006). Many students report that while they recognize the nature of their drinking in college as excessive, it is understood that the drinking behaviors currently engaged in is a construct of college life and will decrease after graduation (Dawson, Grant, Stinson, & Chou, 2004; Workman, 2001). Nevertheless, 6-11% of college student meet diagnostic criteria for substance dependence (Dawson et al., 2004; Knight et al., 2002; Slutske, 2005). Up to 15% of students entering college meet criteria for alcohol dependence the summer before matriculation in higher education institutions, indicating that for many students significant drinking begins in high school and carries over into college (Knight et al., 2002; Wechsler, Dowdall, Davenport, & Castillo, 1995).

The term binge drinking has been defined as 5 drinks in a row/in one sitting for men and 4 drinks in a row/in one sitting for women (Wechsler & Austin, 1998; Wechsler,

Dowdall, Davenport, & Castillo, 1995; Wechsler & Nelson, 2001, 2006; Wechsler & Wuethrich, 2002). This definition, also known as the 5/4 definition, is considered the most common definition of binge drinking and has been used across a wide range of studies relating to risky alcohol consumption among the college population, specifically research focusing on quantity of alcohol consumed as it relates to abuse and dependence (Knight et al., 2002; Slutske, 2005) and alcohol-related consequences (Wechsler, Dowdall, Davenport, & Castillo, 1995, Wechsler & Wuethrich, 2002). The National Institute of Health (NIH) and its division specific to alcohol-related health issues, the National Institute of Alcohol Abuse and Alcoholism (NIAAA) further clarified the definition of binge drinking as being confined to a discrete time period of two hours as opposed to the previous more amorphous wording of “in one sitting” or “in a row” (NIAAA, 2012). The NIAAA (2012) defined binge drinking as “drinking so much within about 2 hours that blood alcohol concentration (BAC) levels reach 0.08g/dL” (“Binge drinking,” para. 1). This BAC corresponds with the 5/4 definition of binge drinking and the 0.08% level corresponds with level of decrease in functioning as a result of drinking (Fillmore & Jude, 2011; Wechsler & Nelson, 2001).

Wechsler and Kuo (2000) used results from the 1999 College Alcohol Study (CAS) to examine how student’s themselves defined binge drinking. The College Alcohol Study is “an ongoing survey of more than fifty thousand students at four-year colleges located in 40 states” (Wechsler & Wuethrich, 2002). Participants in the CAS are asked questions about student life (living situation, classification, activities on campus in which they

participate), their views on alcohol policies and programs on their campus, and their personal alcohol use. Students believed that for a drinking episode to be considered binge drinking women would have to consume five or more drinks and men would need to consume six or more. The students' definition differed from the definition researchers used by one drink, and could indicate a higher threshold for what level of drinking is considered dangerous or problematic from a student's perspective.

The 5/4 definition of binge drinking has been criticized for not taking into account other factors that could influence the body's metabolism of alcohol such as height/weight ratio, BMI, or muscle mass regardless of sex and disputes about how quantity correlates with BAC (Lange & Voas, 2001; Perkins, DeJong, & Linkenbach, 2001). Lange and Voas (2001) found that five drinks led to a blood alcohol concentration of less than .06% and that it took up to 8.2 drinks for men and 6.7 drinks for women to achieve the .08% BAC. The use of the 5/4 definition of binge drinking has been found to be useful because researchers may not be trained or able to convert self-reports about quantity of drinks into the blood alcohol concentration percentages (Fillmore & Jude, 2011). The definition of binge drinking has also been criticized as being confusing with the original use of the term 'binge' as it related to alcohol. The first use of the term binge drinking was used to describe a person who drank constantly for days or weeks (Jellinek, 1960). The stated problems some researchers proposed as inherent in the use of the term binge drinking led to a shift towards finding another term that embodied the nature of student drinking.

Heavy episodic drinking has been defined as “consuming a large number of drinks in a row or within a narrow time frame” (Dawson et al., 2004) or simply heavy consumption of alcohol in a short time period (Wechsler & Nelson, 2006). The term heavy episodic drinking was seen by some as a more favorable descriptor for describing the way college students drink in lieu of the use of the term binge drinking. The World Health Organization (WHO, 2002) uses this definition instead of the more disputed 5/4 definition in its global status report on alcohol. The use of the term heavy episodic drinking is thought to encompass the idea that students drink large amounts over abbreviated time periods and then may go through days or weeks of moderate drinking (Neighbors, Walters, et al., 2007; Rutledge et al., 2008). Known instances of heavy drinking include orientation/beginning of the school year, home football games, 21st-birthday celebrations, spring break, and end of exams celebrations (Neighbors, Walters, et al., 2007).

It is clear from the variety in definitions that the problem of college student drinking is complex and multifaceted. Counselors seeking to provide assistance across the spectrum of drinking issues may benefit from identification of risk factors for abuse common to college students. A first step in understanding risk factors is to identify the incidence and prevalence of drinking as well as the psychosocial factors that contribute to differential rates of drinking across subpopulations of college students.

Incidence and Prevalence

Incidence reports of collegiate alcohol abuse can be difficult to ascertain due to the social acceptance of underage drinking among students as an expected behavior in college (Crawford & Novak, 2006; Workman, 2001) coupled with underreporting of underage drinking and binge drinking (Dowdall, 2009). As a consequence, it is likely the underreporting of interferences with the ability of researchers to know which populations to intervene with and what level of intervention is required. In this section, current estimates of incidence and prevalence are described as a foundation for describing subpopulations of drinkers and the diversity found within the overall population of college students who drink to excess.

Estimates of college student drinking vary widely. For example, Aertgeerts and Buntinx (2002) found that 10.5% of students meet criteria for alcohol abuse. In that same year, Knight et al. (2002) studied abuse and dependence in college samples and found that 31.6% of their sample met criteria for alcohol abuse. Alcohol dependence, which has a higher diagnostic threshold than abuse was found to be evident in 6% of students in Knight et al.'s study. This figure rose to 15.07% of students meeting dependence criteria when Grekin and Sher researched the same topic four years later in 2006. College students are not necessarily more likely to be diagnosed with substance abuse as their non-college peers, but they are more likely to meet criteria for dependence (Dawson et al., 2004; Wechsler & Wuethrich, 2002). Rates of heavy

episodic drinking vary, with 84.2% of students reporting heavy episodic drinking in the past 3 months and 44% in the past two weeks (Ham & Hope, 2003).

The problem of collegiate drinking has gained national attention. In 2007, the Surgeon General declared that the type of drinking behaviors currently being displayed on campuses across the country and the consequences that they entailed were the number one public health problem on campuses nationwide (DHHS, 2007). Several national studies have been conducted to address the Surgeon General's call to action. The College Alcohol Study, described above, is administered to students from various institutional types to gain knowledge about the complete picture of drinking on campus. Monitoring the Future (MTF) is a study completed annually for the past 36 years and funded by the National Institute of Health. Researchers look at the social context of drug and alcohol use and the trends and prevalence of use among youth starting in grade 8 through college and into adulthood. MTF researchers also study trends in beliefs and attitudes related to drug and alcohol use. In 2010, MTF researchers found that overall college students are more likely to have consumed alcohol with the intent of becoming drunk and drinking at binge levels than their non-college peers; with almost half of college students reported having been drunk in the 30 days prior to the survey. (Johnston et al., 2010). Because the MTF has been conducted for over 30 years, researchers have the ability to compare and contrast data from previous iterations of the study. From 1980 to 1993 college students have shown the least decline in alcohol

use when compared to their non-college peers and high school students (Johnston et al., 2010).

The information on abuse, dependence, binge drinking and heavy episodic drinking on campuses presented here provides part of the overall picture of collegiate drinking. Recognizing how category of drinker affects consequences and outcomes of drinking as well as how students expect to feel after drinking can make the picture of college drinking clearer. Demographic and psychosocial variables known to be linked with high risk drinking must also be considered and taken into account as an additional piece to this puzzle.

Socio-demographic and Psychosocial Factors of Problematic Drinking in College Students

Whereas evidence exists that some students enter university settings with clinically significant alcohol use disorders and matriculate through college as alcohol dependent (Grant, 1997; Grekin & Sher, 2006; Knight et al., 2002), psychosocial and demographic variables can be useful predictive tools in identifying students who may be more prone to heavy episodic or high risk drinking within the college environment (Ham & Hope, 2003). In many studies, socio-demographic factors account for a significant portion of variability in drinking behavior (Crawford & Novak, 2006; Grant, 1997; Martin & Hoffman, 1993; Wechsler, Dowdall, Davenport, & Castillo, 1995). Factors related to level of diagnostic threshold college students met included whether a student lived on-campus, off-campus, or with parents (Dawson et al., 2004; Grekin & Sher, 2006), their

social environment (Knight et al., 2002), membership in a Greek organization (Barry, 2007; Knight et al., 2002, Wechsler & Wuethrich, 2002; Workman, 2001), involvement in college-sanctioned athletics (Grossman & Smiley, 1999; Ham & Hope, 2003; Hildebrand, Johnson, & Bogle, 2001), the student's gender (Grant, 1997; Hildebrand et al., 2001; O'Malley & Johnston, 2002; Wechsler, Dowdall, Davenport, & Rimm, 1995), ethnic background (O'Malley & Johnston, 2002; Wechsler, Dowdall, Davenport, & Rimm, 1995), and pre-college drinking history/age at first use (Hildebrand et al., 2001; Knight et al., 2002).

Socio-demographic Factors

Living/Social Environment

Students who reported living in on-campus residence halls or sorority or fraternity housing drank more than those students who live with their parents or off-campus (Martin & Hoffman, 1993; Montgomery & Haemmerlie, 1993; Valliant & Scanlan, 1996). Among the living environments where students were at lowest risk for problematic drinking were substance free residence halls, whereas those students residing in fraternity houses had the highest risk of problematic drinking (Ham & Hope, 2003; Wechsler et al., 2002). Living in a sorority house was not shown to be as strong of a risk factor for excessive drinking as living in a fraternity house, indicating that there is a gender difference in living environment (McCabe, 2002).

Greek Affiliation

Wechsler and Wuethrich (2002) stated that “for college students, the single strongest predictor of binge drinking is fraternity or sorority residence or membership” (p.35). Members of Greek organizations tend to have heavier drinking patterns and report more drinking-related problems than students who do not belong to fraternities or sororities. Greek members had more positive beliefs and expectancies about what alcohol would do for them in terms of social ease, sexual enhancement, and friendship (Barry, 2007; Cashin, Presley, & Meilman, 1998). There also is evidence from Cashin et al.’s (1998) study that members who are in non-executive roles in a fraternity or sorority take their cues about how much drinking is acceptable from their leadership. Students who hold President, Vice-President, or other leadership positions in Greek life set the stage for the drinking culture of that particular organization.

The reputation of Greek systems as heavy drinking environments has the additional problem of creating a selection effect bias. First year students who reported intentions to pledge a fraternity or sorority were connected with higher levels of alcohol use and alcohol problems in the previous year (Ham & Hope, 2003). This indicates that students who are already heavy drinkers seek out Greek systems as a normative environment for their already established drinking habits. Students who are involved in Greek life have long been shown to engage in high risk drinking, to drink more frequently, and to experience more negative consequences than those in general college populations (Barry, 2007; Ham & Hope, 2003; Wechsler & Wuethrich, 2002).

Athletes

Students involved in university athletics have been shown to drink more frequently and experience more negative consequences of their drinking than groups of students who are not athletes (Leichliter, Meilman, Presley, & Cashin, 1998). Length of participation in athletics was associated with increases in risky behaviors related to alcohol consumption (Ham & Hope, 2003; Hildebrand et al., 2001). Wechsler, Dowdall, Davenport, and Castillo (1995) found athletes to be at a higher risk than other populations even after controlling for other relevant risk factors. It may be possible that the close ties that many athletic groups form with their team members is similar to the bonds that form between members of the same Greek organization. Students may have less of a desire to drink responsibly if they believe their fraternity brother, sorority sister, or fellow teammate will be there to watch out for them in the event of nausea, blacking out, or passing out from drinking too much.

Gender

Differences between quantity and frequency of drinking between men and women on college campuses have been evident since research into this topic began. Men have consistently been shown to drink more heavily, more frequently, and with more problematic consequences than women (Ham & Hope, 2003). O'Malley and Johnston (2002) compiled results from several studies looking at the use and abuse of alcohol among American college students. The authors compiled results from the Harvard College Alcohol Study, Monitoring the Future, National College Health Risk

Behavior Survey, and the National Household Survey on Drug Abuse. They found that two and a half as many males (26.4%) as females (9.6%) reported consuming 10 or more drinks per week (O'Malley & Johnston, 2002). When reporting past month drinking, 73% of males reported having consumed alcohol in the past month whereas, comparatively, only 67% of females had consumed alcohol. In 2010, Monitoring the Future researchers reported that 44% of college men reported having 5 or more drinks in a row as compared to 32% of college women, but that since the inception of the study, this difference has begun to narrow slightly with the binge drinking rates slowly declining for males and slowly increasing for females (Johnston et al., 2010). Male students also have been found to be more likely to meet criteria for alcohol use disorders and to maintain and persist in an alcohol diagnosis than women (Knight et al., 2002).

The reasons behind gender differences in drinking may be about gender role socialization or physiological limitations (it generally takes less alcohol for a woman to reach intoxication than it does for a man to reach intoxication). Wechsler, Dowdall, Davenport, and Rimm (1995) stated that women have lower rates of gastric metabolism of alcohol, with females metabolizing alcohol at a rate of about 80% of how men metabolize the substance. Gender roles for women encourage an internalization of stress whereas males may be socialized to externalize stress which manifests by increased drinking behavior (Ham & Hope, 2003). Taking into account a potential double standard between men and women in terms of relationships, women may be more aware of the potential ramifications of unwanted sexual experiences that are

sometimes a result of heavy drinking than men (Ham & Hope, 2003). Men are more likely to be diagnosed dependent and persist in this diagnosis than women (Grant, 1997; Grekin & Sher, 2006).

Ethnicity

O'Malley and Johnston (2002) also discussed differences in drinking among ethnic groups in their study. They found that Caucasian students had the heaviest drinking rates, African-American students had the lowest drinking rates and Hispanic students were intermediate in terms of their level of drinking. Johnston et al. (2010) reported that among 12th graders, African-American students were much less likely to report occasions of heavy drinking (13%) as their White (28%) or Hispanic (22%) peers. The findings of racial differences in drinking were established with early (i.e., 1980s) research on college student drinking and have been persistent since that time (O'Malley & Johnston, 2002). Wechsler, Dowdall, Davenport, and Castillo (1995) also found that being White, male, and single elevated a person's risk of binge drinking. Asian-American and African-American students had the lowest reports of negative consequences from drinking, whereas Native American students reported levels of consequences similar to Anglo-Americans (Ham & Hope, 2003).

Age, Age at First Drink, and Drinking History

Younger cohorts of individuals (i.e., ages 18–29) are increasingly more susceptible to alcohol abuse and dependence than their older counterparts (i.e., ages 30–60; Grant, 1997; Grekin & Sher, 2006). The earlier a person begins to drink alcohol,

the more likely they are to engage in risky drinking behavior as they mature (Wechsler & Wuethrich, 2002). A student's drinking behavior in high school or middle school is a strong indicator for how they will drink in college, with binge drinking in high school being a predictor for binge drinking in college (Wechsler, Dowdall, Davenport, & Castillo, 1995).

The connection between drinking alcohol as a child or adolescent and problematic drinking into young adulthood can in part be explained by the effects of alcohol on the brain. Giedd (2004) has studied brain development during childhood and adolescence and points out that the prefrontal cortex is our brain's primary decision-maker and voice of reason. In the developing brain of the adolescent the prefrontal cortex is not fully mature. The first consequence of using alcohol during this time is that the curiosity propelling adolescents to drink alcohol occurs without the benefit of a full range of executive brain functioning to do a cost-benefit analysis to underage alcohol consumption. The longer range and much more serious consequence of drinking at an early age is that pouring alcohol onto a non-mature brain inhibits the developmental growth, leading to increased instances of making decisions about drinking and other life choices with a brain that is hampered by the effects of alcohol (Giedd, 2004; Wechsler & Wuethrich, 2002).

Having concrete indicators like the ones above is helpful in identifying potential high risk drinkers on campus. These indicators, whether tested individually or combined, have shown to be persistent predictors of problematic drinking among college students.

As a result, these variables are often incorporated when testing regression or more complex models of drinking. Categorizing drinkers and gaining insight into the consequences of alcohol use also provides helpful information and context for gaining a clearer picture of who is at greatest risk from problematic drinking behavior.

Categorizing Drinkers and Consequences of Alcohol Use

To better understand the intensity of drinking behavior it is useful to sort college student drinkers into defined drinking groups. Student drinkers are typically categorized into one of four categories: abstainer, non-binge-drinker, occasional binge drinker, and frequent binge drinker (Dowdall, 2009; Wechsler, Lee, Kuo & Lee, 2000; Wechsler & Wuethrich, 2002). An abstainer is defined as a person who does not currently drink alcoholic beverages. An abstainer may have drunk alcohol at some point in their lives, but have not consumed alcohol for at least 12 months. Non-binge drinkers are consumers of alcohol who drink less than or equal to 3 drinks in a 2 hour period for women and less than or equal to 4 drinks in a 2 hour period for men (Wechsler et al., 2000; Wechsler & Wuethrich, 2002). Wechsler and Wuethrich (2002) defined occasional binge drinkers as students who had 4-5 drinks in a row one or two times in the previous two weeks, whereas frequent binge drinkers were students who drank 4-5 drinks three or more times in the prior two weeks. Such classification allows for comparisons across a number of characteristics, risk factors, and other dependent measures.

The category of drinker that a student falls into has a direct effect on the type and severity of consequences she or he faces as a result (Dowdall, 2009; Presley &

Pimentel, 2006). Such categorization facilitates analysis of different consequences that light, moderate, and heavy drinkers experience. The consequences students face when consuming alcohol are directly proportionate to the level at which they drink (Wechsler & Wuethrich, 2002).

In 2007, the Surgeon General issued a call to action to reduce and prevent underage drinking; citing a multitude of negative effects not only on the adolescents and young adults who drink too heavily, but those individuals who come into contact with them. Others are affected by car accidents, disruption of educational environments, and loud, rowdy behavior emanating from on or near college campuses (Wechsler & Wuethrich, 2002). Consequences of alcohol consumption among students range from hangovers and unwanted sexual contact (Wechsler & Wuethrich, 2002) to unintentional injury deaths (Hingson, Heeren, Winter, & Wechsler, 2005). Physical assault, sexual assault, injury, and engaging in risky behaviors including unprotected sex, driving while intoxicated, or riding with an intoxicated driver are consequences of heavy drinking (Hingson et al., 2005; Knight et al., 2002). Academic related difficulties like missing class are also consequences of heavy drinking. Depending on the category of drinker the consequences suffered may be more or less severe. Heavy and frequent drinkers also accounted for nearly 50% of all the negative effects reported as a result of alcohol use and had three times as many negative consequences as drinkers who drank heavily but not as frequently (Presley & Pimentel, 2006; Wechsler & Wuethrich, 2002). Frequent binge drinkers may be up to 17 times more likely to miss a class than their

non-binge drinking peers, ten times as likely to vandalize property and eight times as likely to get hurt or injured (Wechsler & Wuethrich, 2002).

Consequences of alcohol use or abuse may be mitigated in students' minds due to their perceptions about what they believe or expect to happen when they consume alcohol. Despite some of the negative consequences that students report as a result of drinking alcohol in excess, their positive beliefs, motives, and expectancies about what drinking alcohol can do serve as potential barriers to moderate or reduce consumption.

Alcohol Expectancies, Beliefs, and Motives for Drinking

Alcohol expectancies are the physical and social outcomes students anticipate as a result of consumption (Martin & Hoffman, 1993). College students' beliefs about and motives for drinking are tied to what effects they expect will occur as a result. The types of beliefs that college students hold about alcohol consumption and alcohol-related illness may be a key factor in understanding the college drinking culture phenomenon. "Motivations to drink alcohol constitute the final common pathway to its use, whereby an individual makes the decision to drink based on positive and/or negative reinforcement" (Lyvers, Hasking, Hani, Rhodes, & Trew, 2010, p. 116). The four major themes related to expectancies are social motives, conformity motives (drinking to avoid social disapproval or as part of college culture), enhancement motives, and coping motives (Cashin et al., 1998; Crawford & Novak, 2006; Martens, Ferrier, & Cimini, 2007; Martin & Hoffman, 1993; Lyvers et al., 2010; Osberg et al., 2010; Workman, 2001).

When queried about their beliefs, students saw alcohol as a “vehicle for friendship, social activity, and sexual opportunity” (Cashin et al., 1998, p. 69). The social motive was the most often given response for what students believed and expected when consuming alcohol. Students subscribed to the belief that alcohol ‘enhances social activity,’ ‘facilitates sexual opportunity,’ and ‘breaks the ice.’ There is an established link between beliefs about alcohol and level of consumption. Positive expectancies or beliefs about alcohol may set the stage for excessive drinking and resulting negative consequences.

Conformity motives were also a strong reason for college student drinking behaviors. A friend’s heavy use of alcohol was associated as a risk factor for heavy drinking in students, especially for students who already endorsed a belief that alcohol abuse was central to the college experience. Students reported the extent to which they believed that using alcohol is a key component of the college experience, indicating that alcohol consumption is very central to college life for many students (Crawford & Novak, 2006). However, there are students who would choose not to drink heavily. Those seeking to conform to the culture of the college for fear of being teased for not drinking heavily make up a ‘silent majority’ of students who do not engage in heavy episodic drinking but feel pressure to do so (Berkowitz, 2004). Males who believed alcohol was integral to the college experience were more at risk for heavy drinking than females who held the same belief.

Greek life is a popular way for students to get involved and members of fraternities and sororities are prone to heavier drinking than the non-Greek population (Ham & Hope, 2003). Barry (2007) examined the impact of Greek membership on alcohol-related beliefs and behaviors. He accomplished this by focusing the research into three levels; intrapersonal level factors (past behavior, attitude, subjective norms and perceived susceptibility), interpersonal level factors (observational learning), and institutional level factors (organizational climate). Barry reported that compared with their non-Greek peers, Greeks consume alcohol in greater quantities, thrive in a social culture in which alcohol is a central component, and underestimate risks associated with consumption. Students not involved in Greek life were found to have fewer drinks per week and suffer fewer negative consequences as a result of drinking. A qualitative analysis of fraternity drinking stories identified the ideas that drinking in college was about being adventurous and taking risks, acting in ways appropriately stupid for the college years, with themes of nudity in the context of regretted sexual behavior or attempts at humor during times of lowered inhibition (Workman, 2001). Students who drank as a way to conform cited beliefs that their drinking behavior was time-bound to their college years and would not continue once they reached adulthood in the working world (Crawford & Novak, 2006; Workman, 2001).

Enhancement motives were also given for drinking in college. Students endorsed beliefs that if they were already having a good time, or an event was fun and enjoyable, alcohol would enhance their enjoyment they were already experiencing leading to an

overall more pleasurable experience. Conversely, students who used alcohol to cope subscribed to an expectancy that alcohol could ameliorate or erase bad feelings (Martens, Ferrier, et al., 2007). In addition to the four themes of drinking expectancies, gender, pre-college drinking, Greek affiliation, friends' drinking behaviors, and campus drinking norms are all variables that indicate at what level students will consume alcohol. However, beliefs about alcohol as they relate to the college experience were more strongly related to levels of alcohol consumption than any of the other risk factors (Crawford & Novak, 2006).

Literature studying college students expectancies when consuming alcohol suggests that social norms theory, a well-established explanatory model of drinking behavior, accounts for only a piece of the puzzle of high risk drinking in college populations. This may explain why campus social norms campaigns have furnished mixed results in reducing drinking intensity among college students (Thombs, Dotterer, Scott, Sharp, & Raub, 2004) Thombs et al. studied a social norms campaign and found that in general, student respondents did not find the campaign messages credible. Furthermore, those students who drank greater amounts of alcohol perceived the campaign message to be even more improbable. In other words, students who drank at higher levels were more easily able to dismiss the campaign messages as being unrealistic based on their personal perceptions.

In 1993, Martin and Hoffman developed a model of college student drinking that accounted for 50% of the variance of alcohol use in their sample. The model included

alcohol expectancies, living environment, peer influence, and gender. Alcohol expectancies accounted for 36% of the variance, living unit accounted for 8%, and peer influence accounted for 5%. Gender was not found to be a significant predictor. The findings of Martin and Hoffman are parallel to other researchers who have studied these influences on alcohol consumption in college samples (Wechsler, Dowdall, Davenport, & Castillo, 1995). Martin and Hoffman (1993) conceptualized their findings using the Health belief model, stating that campus alcohol interventions focus on severity of consequences and benefits of change but fail to address the barriers that impede college students from changing their drinking behaviors.

Collectively, research findings on college students' beliefs, expectancies, and motives for drinking have led researchers to similar conclusions answering the question of why students consume excessive alcohol. Ease in social situations (Cashin et al., 1998; Martin & Hoffman, 1993), campus drinking norms/Greek life culture (Barry, 2007; Workman, 2001), or subscription to the belief that alcohol use and abuse is central to the college experience (Crawford & Novak, 2006; Osberg et al., 2010) are a few answers to this question.

A trend in college drinking research has been for investigators to include socio-demographic variables in the analyses as a way to compare their predictive ability compared to a theoretical model. Although socio-demographic variables are important in understanding individual traits related to alcohol consumption behaviors, "research grounded in theory could potentially offer a more comprehensive picture of drinking

problems among college students” (Lewis & Osborn, 2004, p. 3). Ultimately, researchers have been interested in exploring if drinking is a function of theoretical constructs or merely a function of socio-demographic characteristics, or some combination of both. Indeed, a common trend in collegiate alcohol research is assessing the predictability of select socio-demographic variables to alcohol use.

With socio-demographic factors aiding in the understanding of at-risk populations among collegians and 36% of variance about alcohol use being explained by alcohol expectancies (Martin & Hoffman, 1993), a logical next step in the research process of understanding college student high risk drinking behavior is looking at beliefs through an established theoretical framework. Social norms theory has been strongly validated in relation to college student drinking; yet application of social norms interventions alone has not proven sufficient to fully address the scope of problematic drinking on campuses. A review of social norms theory, definitions, and approaches is reviewed below, followed by a discussion of the health belief model, a widely used paradigm for understanding motivations for engaging in healthy and unhealthy behaviors such as drinking, but which has not been fully applied to alcohol misuse in college settings.

Social Norms Theory

Most research on college alcohol consumption has been atheoretical; that is, researchers have summarized the prevalence, consequences, and correlates of heavy alcohol use outside the context of theory. However, incorporating theoretical models

into the study of college alcohol use provides greater explanatory power of the mechanisms that underlie drinking behavior, and paves the way for theory-based interventions. Researchers have called for the study and application of accepted theoretical models to be applied to college drinking (Cashin et al., 1998). The first of two theoretical models, social norms, will be discussed next; the inception of social norms theory, definitions pertaining to the theory, and its application in the context of college alcohol consumption. Information about social norms campaigns and an overview of the differing levels of prevention and intervention approaches is also discussed. Strengths and limitations in these campaigns will be explored.

History, Purpose, and Use of Social Norms Theory

Social norms theory was first posited in 1986 by H. Wesley Perkins and Alan Berkowitz to analyze student alcohol use patterns (Berkowitz, 2004; Perkins & Berkowitz, 1986). The researchers sought to understand college student use of alcohol and found that students consistently overestimated the amount of alcohol that their peers were consuming and the extent to which their friends were supportive of excessive drinking behavior (Berkowitz, 2004). This overestimation of alcohol consumption was found to be predictive of how much individuals drank (Perkins & Berkowitz, 1986). The novelty of Perkins and Berkowitz's research was that their approach to addressing the issue. Instead of the traditional intervention strategies that included information campaigns, identification and treatment of problem users, or fear-inducing messages about consequences (Schultz et al., 2006); the researchers proposed

a model that highlighted the healthy norms of the majority of students on campus. As such, an effort was made to increase these by using information about healthy norms to intervene with alcohol abusers (Berkowitz, 2004). In addition to understanding alcohol behavior, the social norms approach has been applied to bullying (Biggsby, 2002; Perkins, Craig & Perkins, 2011), problem gambling (Larimer & Neighbors, 2003; Neighbors, Lostutter, et al., 2007) intimate partner violence (McDonnell, Burke, Gielen, O'Campo, & Weidl, 2011), illegal digital downloading (Wang & McClung, 2011), reducing or delaying the onset of tobacco use (Haines, Barker, & Rice, 2003; Hancock, Abhold, Gascoigne, & Altekruise, 2002; Hancock & Henry, 2003; Linkenbach & Perkins, 2003), seat belt usage (Perkins & Linkenbach, 2004), and preventing sexual assault (Bruce, 2002; Hillenbrand-Gunn, Heppner, Mauch, & Park, 2004; Rodriguez, Kulley, & Barrow, 2003; White, Williams, & Cho, 2003). When using the social norms theory, a consensus exists among researchers in favor of the term "social norms theory" to describe the underlying theoretical concepts and "social norms approach" to describe the interventions that are used based on social norms theory (Berkowitz, 2004). Other terms that are sometimes used in the literature when social norms theory is being discussed include proactive prevention model (Berkowitz, 1997, 1998), social norming (Hunter, 1998), the perceived norms model (Thombs, 2000), and norm correcting or norm challenging model (Farr & Miller, 2003; Peeler, Far, Miller, & Brigham, 2000). To better understand the social norms paradigm, an overview of the terms associated with this theory is provided.

Types of Norms

Descriptive social norms. Descriptive social norms are the “perception of others’ quantity and frequency of drinking based largely on observations of how people consume alcohol in discrete drinking situations” (Borsari & Carey, 2003, p. 331). In other words, descriptive norms describe drinking behavior as observed by respondents. This type of norm is the one used most often in research employing a social norms approach as it provides the information about perceptions of drinking and actual consumption that social norms media campaigns are built on (McAlaney, Bewick, & Hughes, 2011). Descriptive norms are the primary norms assessed in the current study.

Injunctive social norms. Injunctive social norms relate to “perceived approval of drinking, represent[ing] perceived moral rules of the peer group” (Borsari & Carey, 2003, p. 331) or “attitudes or what people feel is right based on moral beliefs” (Berkowitz, 2004). Therefore injunctive social norms represent ideas, attitudes, and moral convictions held about alcohol and drinking as opposed to actual behaviors. There has been a dearth of research specific to addressing how injunctive norms influence drinking behavior in comparison to the preponderance of research that focuses mainly on descriptive norms (McAlaney et al., 2011).

Proximal social norms. Proximal social norms are those that indicate nearness or closeness of the friend groups and use wording such as “best friend” (Berkowitz, 2004) when using terms to give students a context. Proximal norms are represented by those individuals who are “close by, next or nearest to the participant” (Borsari & Carey, 2003,

p. 334). An example of proximal social norms include the student participant's closest friend group such as their fraternity/sorority or those with whom they identify as being most like themselves.

Distal social norms. Distal social norms are on the opposite end of the spectrum from proximal norms and signify being remote or removed from the friend group that the student identifies with. Drinking comparisons are often made with the "average student" as a reference group. Distal norms are those that are "farthest away from the participant" (Borsari & Carey, 2003, p. 334). Distal norms are any referential group that a student would be the least likely to identify with or ones that use generalized as opposed to specific language in describing the social distance to the student. An example of a distal norm social relationship might be a peer attending the same university but with whom the student has very little to no contact and perceives to be in a different social group entirely.

Differentiating the types of norms that exist is particularly important in social norms research given that some types have been found to better predict students' drinking levels because they are more relevant and meaningful (Berkowitz, 2004; Borsari & Carey, 2003; Korcuska & Thombs, 2003). For example, proximal norms have been found to be better predictors of behavior than distal norms because "misperceptions increase as social distance increases" (Berkowitz, 2004, p. 13). If a female student reads a social norms campaign media message that specifically mentions a normative message about the drinking behaviors of other women on campus, she might be more likely to

think about and compare her own behavior to those presented in the normative message. It therefore makes sense that the closer the reference group, the more likely people are to stop and think about the message. If the woman in this example read a normative message that described drinking behaviors of friends in her residence hall or fellow sorority members, it is likely because of its personal relevance to her the woman's attentiveness to the message would increase. Because social norms research rests heavily upon student buy-in to the new norms that are offered, it is especially essential to gather data and present new norms that students can relate to if an intervention is to be successful. Students are much more likely to identify with new norms that they perceive to be gleaned from data including close peer relationships (proximal norms) than those that are gathered from distant or remote groups with which that student does not identify (distal norms). Different types of misperceptions may arise based on how a student perceives their close friends to be drinking as opposed to how a typical student on their campus drinks.

Types of Misperceptions

In their 2003 meta-analytic review of social norms theory research, Borsari and Carey used the terms "self-other discrepancy" (SOD) to describe any incongruity between the student's perception of and attitude towards their own drinking and that of their peers. It is possible to further delimit this construct and specify types of misperceptions. Three main types of misperceptions exist in social norms literature: pluralistic ignorance, false consensus, and false uniqueness.

Pluralistic ignorance. The most common of the three, pluralistic ignorance, refers to students who wrongly believe that the majority of their peers behave or think differently from them while in actuality their own attitudes are very alike (Miller & McFarland, 1987, 1991; Prentice & Miller, 1996; Toch & Klofas, 1984). In the pluralistic ignorance phenomena, students fail to realize that their own behaviors regarding alcohol are closely in line with their peers. For instance, a student goes to a party and has 3 beers. Fellow party goers who appear visibly drunk, the volume of alcohol available for consumption, and the four fraternity men getting loud cheers for repeatedly taking shots all feed into a misperception that the majority of party-goers are drinking more than the student's 3 beers instead of the four most visible heavy drinkers. Social norms media campaigns attempt to address pluralistic ignorance by correcting this misperception and reassuring students that most of their peers in fact are having three or fewer drinks as they consume; reducing fear and embarrassment of appearing to behave differently (Berkowitz, 2004).

False consensus. False consensus refers to an incorrect assumption that others are like oneself when in reality they are not (Ross et al., 1977). This type of misperception is often used by heavier drinking students to justify abusive drinking practices. In false consensus, the student convinces him or herself that 'everyone' is drinking at this level, which can fuel denial about one's drinking being excessive (Berkowitz, 2004). False uniqueness occurs when "the perception that one's position or attributes are more uncommon than is actually the case" (Suls & Wan, 1987, p. 211). For

example, students who are in the minority (e.g. abstainers) think that the difference between themselves and others is greater than it is in reality.

Information about how norms affect behavior can provide insight into why certain populations behave in particular ways with regards to drinking. For example, men are typically more reluctant to defy norms because of fears about embarrassment or ridicule for violating gender-specific norms (Berkowitz, 2004). Students who use alcohol in an abusive manner are more likely than their peers to have misperceptions about the general climate of college student drinking (Berkowitz, 2004). Same-sex proximal norms are stronger predictors of drinking behavior than same-sex distal norms (Berkowitz, 2004; Borsari & Carey, 2003).

An accurate understanding of the types of misperceptions that exist is essential in social norms research because the way interventions progress in this area is by identifying the misperceptions that exist in order to provide new normative information that challenges incorrect beliefs. Researchers have used social norms theory in an effort to build insight into college drinking and provide interventions based on the information provided by the students about their perceptions of drinking among their friends and peers at their universities.

Social Norms and College Drinking

Social norms theory has been applied in the context of college student drinking behavior for nearly 30 years. Social norms theory itself is a way of understanding how the behaviors of peers influence behaviors of individuals; while the social norms

approach encompasses a set of procedures for gathering data and intervening with new information that researchers implement after identifying self-other discrepancies among students (Berkowitz, 2004). Misperceptions of the behaviors of others play an important role in the behaviors of students. The research done to date on college student drinking applying social norms theory has consistently yielded results indicating that perceptions, or misperceptions, of drinking on campus explain more of the variance in college student drinking behavior than any other variable (Beck & Treiman, 1996; Korcuska & Thombs, 2003; Page, Scanlan, & Gilbert, 1999; Perkins, 1985; 1987; Perkins & Wechsler, 1996; Thombs, Wolcott, & Farkash, 1997). After social norms theory has been employed to gather an understanding of behavior, an implementation of the social norms approach follows. The intention of the social norms approach is to reeducate students by providing actual levels of alcohol use and attitudes towards drinking and conveying that they are in actuality, more moderate than most students presume (Borsari & Carey, 2003; Perkins, 2002).

Social Norms Campaigns

In the context of college student drinking the social norms approach, also referred to as social norms campaigns, are interventions designed to challenge misperceptions about excessive drinking. These interventions typically consist of data collection where information is gathered about the individual student's drinking behaviors, their perception of peer behaviors, and the discrepancy between the two. Next, a media campaign that highlights inaccuracies of perceptions by reporting average

alcohol consumption statistics is marketed to the student body through campus media outlets (newspapers, posters, pamphlets), small group discussions, or individual interventions in an attempt to influence behavior by correcting misperceptions (McAlaney et al., 2011). After a campaign's messages have been delivered, there is typically a post-test to determine the efficacy of campaign messages in reducing the alcohol consumption of participants and/or influencing attitudes about excessive drinking. Social norms campaigns can be implemented on three levels: universal prevention, selected prevention, and indicated prevention.

The use of social norms theory in regards to collegiate drinking has produced knowledge about general trends in drinking behaviors on campus through universal prevention techniques. Universal prevention focuses on an entire campus population without regard to identification of at-risk members of the population. Campus-wide applications of the social norms approach have been found to reduce drinking rates from 20-40% over four years (Perkins & Craig, 2002; Foss, Deikman, Godoman, & Bartley, 2003). Foss et al. (2003) utilized actual BAC data, further strengthening the scientific method within this particular application of the social norms approach. The social norms approach is sometimes conducted on a campus-wide level but fewer studies exist in the context of the larger campus (McAlaney et al., 2011). The approach is also implemented in more focused, specific points within a student population.

One area of social norms study where researchers have attempted to capitalize on the power of proximal social norms is that of selective prevention. In selective

prevention, campaign messages are targeted at smaller, specific populations such as a particular fraternity, athletic team, first-year students, or members of the same academic classification (Berkowitz, 2004). With this method, the reference group is kept as close to the individual student as possible (proximal norming) in order to increase the likelihood that the student will regard the message as personally relevant. Far and Miller (2003) implemented a small group 45-minute workshop delivered in a talk-show style at Washington State University that was found to produce “reductions in drinking among first-year students, Greeks, and athletes who received the intervention and was sustained enough to create campus-wide reduction in drinking over a number of years” (Berkowitz, 2004, p. 19). Several researchers have implemented the small group norms challenging model with success at lowering drinking in college men (Peeler et al., 2000; Steffian, 1999), first year students (Schroeder & Prentice, 1998), and decreasing rape supportive attitudes in high school boys (Hillenbrand-Gunn et al., 2004). Bonday and Bruce (2003) also adapted a small group norm model for fraternities that reduced negative consequences fraternity members experienced, but found it to be ineffective with this group in decreasing actual drinking rates.

The final level of social norms approach is the indicated prevention level for individual social norms interventions. This level specifically targets high-risk drinkers or abusers as a way to address misperceptions and denial of misperceptions about drinking (Berkowitz, 2004). Providing personalized, individual feedback to drinkers has been shown to be effective in reducing alcohol consumption (Agostinelli, Brown, & Miller,

1995; Neighbors, Larimer, & Lewis, 2004; Walters, 2000). These individualized interventions can include sending graphic feedback to participants detailing how their drinking behaviors compared to the norm (Agostinelli et al., 1995) and with computerized normative feedback showing reduced alcohol consumption at three and six months follow-up data collection points (Neighbors et al., 2004).

Some campuses choose to mix intervention levels among campus-wide, selected (small group) and indicated (individual) levels of intervention. While this process can provide a synergistic and cohesive nature the normative messages being provided, there are also campuses that use social norms messages as one part of several initiatives to reduce drinking on campus. These can serve as confounding variables for being able to attribute changes in attitude and behaviors completely to the social norms approach as opposed to other methods of intervention. It is important to be able to identify the characteristics at play on individual campuses as a way to accurately evaluate the effectiveness of social norms programs.

Social norms campaigns are not consistently found to be effective. In 2006 DeJong and his colleagues conducted a multisite, randomized trial of a social norms marketing campaign and found that students attending treatment institutions had a ranged from 1.1% decrease in drinking up to a 10.6% increase while control institutions had increases in drinking from 17.5% to 24.7% (DeJong et al., 2006). Overall, the researchers concluded that social norms marketing campaigns on the treatment campuses “protected the experimental group institutions from broader social forces

that were driving student alcohol consumption up nationally from 2000 to 2003” (DeJong et al., 2006, p. 877) and that the campaign provided a protective effect for students. In an attempt to replicate the findings from this study, DeJong et al. (2009) failed to repeat findings that students attending treatment institutions had a lower relative risk of alcohol consumption. Scribner et al. (2011) further clarified the findings of the replication failure study by DeJong and colleagues by studying the alcohol environment. They found that social norms marketing interventions may be less effective on campuses where there are higher densities of on-sale alcohol outlets due to the moderating effect of campus alcohol environment on social norms campaigns.

There may be several reasons for the lack of consistent findings of effectiveness. Fabiano (1999) detailed six stages of implementing a social norms media campaigns that include (a) Assessment/data collection, (b) Selection of a normative message, (c) Testing the message with the target group, (d) Selecting the normative delivery strategy, (e) Dosage of the message, and (f) Evaluation of the effectiveness of the message. Errors at any of the stages can result in an ineffective social norms campaign. If students are unclear about the message, the message seems confusing (Clapp et al., 2001), or if the source providing the normative message is not believable (Granfield, 2002) then the integrity of any post-test data evaluating the program may be compromised. In one instance, normative media was rejected by fraternity men who felt they were under attack by the school administration for their drinking behaviors (Granfield, 2002). Noting

the different ways in which message can be interpreted or dismissed are important in evaluating the effectiveness of the approach.

Some studies have indicated that social norms campaigns have actually increased the undesirable behaviors they were designed to reduce (Perkins, Haines, & Rice, 2005; Wechsler et al., 2003; Werch et al., 2000). Schultz et al. (2006) described this phenomenon in their examination of the 'boomerang effect' of social norms by detailing the constructive, destructive, and reconstructive power of social norms. A social norms campaign provides specific normative information which individuals then compare to their own behavior. The authors describe the boomerang effect as occurring when consumers compare their actions to the described norm and this norm "acts as a magnet for behavior for individuals both above and below the average" (Schultz et al., 2006, p. 430). While this can have the desired effect of bringing individuals above the norm closer to a typical level of behavior, it may also serve to increase an undesired behavior in individual below the norm. The researchers tested this theory using a social norms approach applied to household energy use with both a descriptive and injunctive components. One group was given only descriptive norm information while the other was provided with both descriptive and injunctive (monthly statements with a smiley face for households with below-average energy consumption and a sad face for households with above-average consumption) information. Above-average energy users who received the descriptive norms only message reduced their energy consumption, proving the constructive power of social norms. They found that below-average energy

user households that received only the descriptive information showed an increase in consumption from baseline. The authors posit that this illustrated the boomerang effect, or the destructive power of social norms. However, when an injunctive message was added to these households, the boomerang effect diminished, demonstrating what the authors term the reconstructive power of social norms. The results from this study indicate that there are some variations in behavior possible based on the type of norms that are presented and which group (above-average or below-average) and can also illuminate some of the variability found in effectiveness of social norms programming.

The social norms approach and use of media campaigns can exhibit both strengths and limitations depending on scope, breadth, and implementation. The strengths of the social norms approach are that it has been studied for a span of some decades, giving researchers information to build on to continue to shape expertise on how collegiate drinking can be viewed through this paradigm, in addition to a better understanding of where adjustments need to be made and affording opportunities for replication of successful interventions. Social norms approach also provides a tool for explaining variances of collegiate drinking behavior. The constructive power of social norms as outlined by Schultz et al. (2006) has been demonstrated at various levels of intervention.

Although the underlying theory of social behaviors being influenced by normative perceptions is clear, the efficacy of social norms campaigns have been found to have mixed results due to limitations within the social norms approach (DeJong et al.,

2006, 2009; Schultz et al., 2006; Scribner et al., 2011). Differences in implementation, soundness of methodology, fidelity to the six steps outlined by Fabiano (1999) in designing successful social norms campaigns all influence the outcome of research using this approach. How messages about norms are perceived and internalized are also factors to consider and can limit the value of interventions (Granfield, 2002). The boomerang effect, or destructive power, of social norms that occurs when individuals already engaging in a desired behavior shift towards an undesired behavior after receiving normative messages must also be considered as a potential limitation of the social norms approach (Schultz et al., 2006). These limitations of the social norms approach are can serve to undermine the effectiveness of this tool for addressing the drinking behaviors of college students.

Limitations of Social Norms

Several limitations exist in implementing the social norms approach with regards to collegiate drinking. One of these is that use of the social norms approach relies heavily on discovering and addressing misperceptions of peer drinking. While in the majority of cases these misperceptions exist (Borsari & Carey, 2003) they do not always. There are some groups for whom misperceptions are smaller, or for whom their perceptions of heavy drinking are very accurate. An example would be fraternity men who accurately perceive the heavy drinking of their group (Berkowitz, 2004). In these cases, another paradigm to address drinking that does not rely on the presence of a misperception to correct is warranted. In addition to a lack of misperceptions to address

with this population, prior research has indicated that fraternity members are one of the higher risk groups for problematic drinking behaviors (Ham and Hope, 2003; Workman, 2001) and research specific to the social norms approach with fraternity men has been found to be ineffective at changing drinking behaviors of this population (Bonday & Bruce, 2003). The lack of literature addressing injunctive norms at the same rate as descriptive norms also serves as a limitation to fully understanding the scope of how norm messages can be effective (McAlaney et al., 2011). Research on the social norms paradigm that studies different types of norms also serves to make it harder to compare effectiveness across studies (Borsari & Carey, 2001). Because of their increased level of risk and the reduced effectiveness of social norming with male Greek groups in particular, it is necessary to explore other approaches either alone or in tandem with social norms theory to address changing behaviors for drinkers at risk of increased problems and negative consequences as a result of their drinking.

The indication of social norms theory is that by educating students about their own misperceptions of peer drinking behavior students will begin to self-regulate and drink less because they will no longer fear being out of sync with their friend group once normative messages have been delivered and internalized. Evidence that students do not always identify with normative messages if they are normed on a peer group that is too distant (distal norm) (Berkowitz, 2004; Borsari & Carey, 2003) or if the message is perceived as unclear, confusing, or a punitive action by administrators, it may not be accepted as truth or acknowledged (Berkowitz, 2004; Clapp et al., 2001; Granfield,

2002). Instances of poorly formed messages or media campaigns that do not garner a positive reception exist throughout efforts to design media campaigns based on social norms data. Any of the above reasons that a student has to dismiss the relevance of the media campaign to their personal drinking behavior serves as a potential limitation within the social norms paradigm. Messages are external and based on peer group consensus, which can be a strong influence on behavior but is not always effective. One possibility for addressing this limitation is to apply a theoretical framework that allows students to use themselves as a normative baseline by tapping into personal beliefs about how much alcohol consumption is healthy, what they perceive as their individual level of risk from heavy drinking, and their own judgments about the costs and benefits of moderate drinking. One framework, consistent with social norms theory but much more focused on the individual, and which has not been previously applied to the context of college student drinking, is the Health Belief Model.

Health Belief Model

Despite a wealth of knowledge and information available on the subject of alcohol misuse in the college population, the problematic use and abuse of alcohol still persists on many campuses regardless of numerous and varied attempts at addressing the issue. Taking what is currently known about the strengths and limitations of a well-researched and current model of college drinking, such as social norms theory, and combining it with a new model may enhance our understanding of the key mechanisms related to collegiate drinking, provide better direction for intervention, and address

gaps in existing methods to reduce drinking. The following section will outline the health belief model and its four major concepts. The process of validating the individual constructs associated with the model and an explanation of how the theory has been applied in research to date will follow, expounding on its potential promise as a mediating factor, predictive tool, and blueprint for intervention strategies.

History, Purpose, and Use of Health Belief Model

The health belief model (HBM) was originally designed in the 1950s by Irwin Rosenstock, a social psychologist, to understand under-utilization of preventative health services and programs among individuals at risk for specific diseases (Janz et al., 2002; Rosenstock, 1966). Part of the reason the Health belief model has made such a valuable contribution to the field of public health is that it was designed to help identify faulty beliefs and determine individual barriers to appropriate participation in programs intended to prevent and detect disease. By identifying and understanding these barriers health educators might be better equipped to design programs that address inaccurate beliefs and maladaptive attitudes (Henshaw & Freedman-Doan, 2009; Janz et al., 2002). Portnoy (1980) stated that HBM serves as a theoretical construct by which health behaviors are predicted and later altered. Indeed, another reason for the value of this model is its potential predictive value for calculating health behavior based on beliefs and intervening through well-developed programs and health promotion activities (Iverson, 1978).

Marshall Becker, Lois Maiman, and John Kirscht (Becker, Maiman, Kirscht, Haefner, & Drachman, 1977), along with colleagues, later extended the model to include an individual's response to symptoms and medical compliance (Henshaw & Freedman-Doan, 2009; Janz et al., 2002). HBM was born out of concerns about the limited success that U.S. Public Health Services programs were experiencing (Janz et al., 2002). The model has been in use for over five decades and has been applied to a wide range of health behaviors from breast cancer screening/mammography (Russell, Perkins, Zollinger, & Champion, 2006), colon cancer screening (Lachter & Epel-Baron, 2008), STD/HIV testing (Manu & Sriram, 1999; Scandell, Wlazelek, 2002; White, 2004), smoking (Knight & Hay, 1989; Rahnavard, Mohammadi, Rajabi, & Zolfaghari, 2011) and recently to mental health behaviors such as depression and substance abuse screening (Henshaw & Freedman-Doan, 2009).

Health Belief Model Constructs

The components of the health belief model are concise and intuitive. The model is comprised of four main elements: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers; each of which are described in detail below. Additional constructs of the HBM include cues to action and self-efficacy. The main hypothesis of the HBM is that people are most likely to engage in preventative health behaviors when they (a) perceive that their personal susceptibility is high, (b) perceive the disease in question to be serious, (c) see the benefit in adopting the preventive behavior, and (d) perceive few difficulties in adopting the preventive behavior (Iverson,

1978). Cues to action, which is not always observed in Health belief model research, are occurrences in which a person is reminded of their personal susceptibility through some experience (Henshaw & Freedman-Doan, 2009). Self-efficacy, which also is a less studied aspect of the theory due to its being added after the original theory was construed, is the idea of how able an individual feels they are at engaging in a particular behavior (Rosenstock, Strecher, & Becker, 1988). Originally, the theory was posited to understand why individuals did not engage in simple preventive health behaviors such as an immunization, making the need for self-efficacy in such a task irrelevant. However, when the model began being applied to long term behaviors and more chronic illnesses in which substantial behavior changes must take place (e.g. a healthy eating plan or regular exercise routines for diabetics) the concept of one's self-efficacy became more relevant (Rosenstock et al., 1988).

Perceived susceptibility. Perceived susceptibility is an individual's beliefs about how predisposed he or she is to being diagnosed with a particular medical condition. It is the level to which individuals believe they are prone to being diagnosed as alcoholic or alcohol dependent or how likely they believe this is to happen to them at some point in their lives. Perceptions about susceptibility are highly variable among individuals, even those among the same age, gender, peer, or ethnicity and race groups (Janz et al., 2002). However, some early studies on healthcare utilization found that in general younger to middle aged people, females, and those with higher levels of education and income were more likely to seek health services, suggesting a greater degree of

perceived susceptibility (Rosenstock, 1966). Some individuals take into account family history of a disease when deciding on their personal susceptibility. Other factors that impact perceived susceptibility include a person's current experience of symptoms of a disease (to the extent that they are knowledgeable about the symptoms) or beliefs about how their life choices make them more at risk for developing a disease.

Perceived severity. The concept of susceptibility to a disease alone does not always motivate individuals to take preventative measures. Once an individual has formulated an opinion on the level to which he or she feels susceptible to a disease, the next phase of the HBM is determining the person's views on how serious or severe a diagnosis, such as alcohol dependence, would be. The combination of perceived susceptibility and perceived severity equates to *perceived threat* (Janz et al., 2002). HBM posits that a person is most likely to take action to avoid a potential health risk if he or she believes contracting the disease would have some negative impact on his or her life (Iverson, 1978; Janz et al., 2002). College students, depending on developmental level and maturity, may still be operating in an adolescent mindset of feeling invincible to most diseases or conditions. It may be difficult to convince otherwise physically healthy and mentally sound 18-21 year olds of threat of any disease or mental health problem, including alcohol/substance dependence.

Perceived benefits. Perceived benefits are an individual's estimation of the effectiveness of participating in behaviors that reduce risk of becoming, for example, alcohol dependent (Janz et al., 2002; Rosenstock, 1966). Related to the current study,

perceived benefits of not binge drinking would reduce the probability of experiencing negative consequences. One way to conceptualize perceived benefits is from a cost-benefit analysis (Miller & Rollnick, 2002). Attitudes about susceptibility and severity (threat) constitute the costs of continuing to drink at high rates for students. Benefits of stopping drinking at high rates for students might include less incidences of headaches, hangovers, unplanned sexual activity, or illness/nausea. Wechsler and Wuethrich (2002) delineated the numerous negative consequences that students experience as a result of drinking, and how the severity of those consequences is correlated with the quantity of alcohol consumed. Academic consequences such as missing class, falling behind in coursework, or earning failing grades are more prevalent in students who drink heavily when compared to those who do not (Wechsler & Wuethrich, 2002). Other consequences such as unwanted sexual contact, injury, vomiting or blackouts are typically related to binge drinking episodes (Wechsler & Wuethrich, 2002). Perceived benefit, then, is the cognitive mechanism in which students say to themselves 'if I don't drink, I won't experience vomiting/injury/etc.' In other words, students may find benefit in having fewer experiences of the negative side effects of drinking heavily. Other benefits for students might include missing fewer classes due to drinking related illness, fewer incidences of blackouts where one awakens from a heavy drinking episode disoriented and unsure about the events that occurred or the behaviors one engaged in and cannot remember. Fewer incidences of run-ins with campus or community law enforcement officials could reduce embarrassment and worries of informing parents

about legal consequences. Students may also see the benefit of remaining out of the Dean's office for disorderly conduct, judicial sanctions, or violating university alcohol policies and the resultant fines associated with drinking citations. Time, energy, and money spent on referrals to campus or community substance abuse counselors for costly alcohol and drug assessments also might serve as a potential benefit for students wishing to avoid these interactions.

Perceived barriers. For some college students the perceived barriers may be just as numerous as the perceived benefits, making the cost-benefit analysis more complicated. Perceived barriers are the potential negative consequences of taking a particular health action (Janz et al., 2002). For students, healthy actions related to alcohol use include drinking in moderation and avoiding binge drinking, a style of drinking that is likely to lead to the negative consequences (Weschler & Wuethrich, 2002). However, college student drinking does not often happen in moderation as the health actions stated above are not in line with the way many college students drink alcohol. Because so much of the drinking that students engage in is tied to their social activities, some students may see participating in these healthier actions (i.e., moderation, avoiding binge drinking) as a barrier to their social interactions with peers. For example, a student might be teased or ostracized if he or she were to avoid drinking at the same level as peers. To avoid social rejection, the student may engage in heavy drinking. He or she thinks, 'if I drink less, my friends will think I do not fit in or am not

fun!' In essence, peer pressure becomes a barrier to engaging in healthy drinking behavior.

This phenomenon relates to social norms theory, described above. Students, who might otherwise inherently possess beliefs that excessive drinking is not in line with their personal values, may reject that idea in the context of their heavy-drinking college community. The individual's desire not to engage in binge drinking may be overshadowed by seeking to conform to what is believed to be the norm for their peers. In other words, the student has social as well as cognitive/individual forces operating on him to drink. From a social norms perspective, he is being pulled to drink based on his perceptions that everyone else is drinking heavily, even if they are not. From a health beliefs perspective, the perceived barriers that are presented as a result of this may include being teased for not drinking at the level of his peers or being excluded from future social events if he is believed by others to disengage in or dislike binge-drinking environments. This is especially true if the student in question is male and in a fraternity, where drinking games for sport and competition abound (Workman, 2001). Other perceived barriers of college students might be that they are missing out on fun events that include heavy drinking such as home football games, Spring Break trips, or 21st birthday parties (Neighbors, Walters, et al., 2007; Rutledge et al., 2008) or that these events are automatically less fun without large amounts of alcohol. Because heavy drinking is so imbedded in the culture of many colleges and universities, and especially within many groups within the college/university system (e.g. Greek Life, college

athletics) it may be easy for students to give in to barriers and de-emphasize benefits of healthy action. To avoid social rejection, the student has social as well as cognitive/individual forces operating on him to drink. From a social norms perspective, he is being pulled to drink based on his perceptions that peers are drinking heavily, even if they are not. From the perceived barriers construct of the health belief model he believes he will be teased for not drinking at the level of his peers.

Cues to action. Cues to action are defined as “incidents serving as a reminder of the severity or threat of an illness” (Henshaw & Freedman-Doan, 2009, p. 421) or “a factor that serves as a cue or a trigger to trip off an appropriate action” (Rosenstock, 1966, p. 101). Imagine a man who witnesses the heart attack of his best friend who is similar to him in age, height, weight, and lifestyle. The heart attack that prompts this man into adopting a healthier diet and increasing exercise would be an example of a cue to action. In the context of the present study, a college student diagnosed with alcohol abuse might find herself violating the campus alcohol policy for the third time. Facing expulsion from the university, she may view this incident as a cue to action, or a nudge to take a closer look at how her alcohol abuse is creating problems in her academic life, personal health, and attainment of goals.

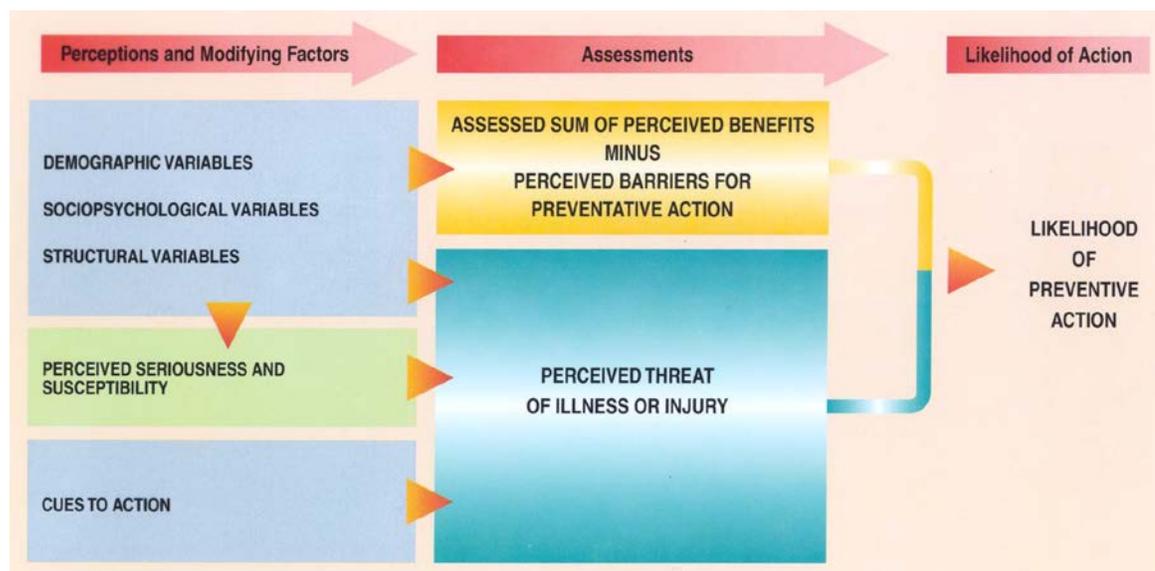
The role of cues to action in health beliefs research have not systematically been studied empirically (Janz et al., 2002). Although cues to action have been neglected as a variable in research using the HBM (Henshaw & Freedman-Doan, 2009; Rosenstock, 1966), they can serve as the jolt that someone needs to move in a healthy direction. The

construct can be difficult to study because “a cue can be as fleeting as a sneeze or the barely conscious perception of a poster” (Janz et al., 2002, p. 50).

Self-efficacy. This final construct was included in the model beginning in the 1980s (Rosenstock et al., 1988). Self-efficacy in relation to the health belief model might include one’s own perceptions about how successful they are likely to be at engaging in a health behavior. Self-efficacy was stated as the conviction that one can successfully engage in the behaviors needed to facilitate the desired outcome (Bandura, 1977). For example, a woman who engages in healthy eating, practices self-breast examinations monthly, and follows the recommendations for regular mammograms may experience increased self-efficacy at her ability to prevent breast cancer or detect the disease in its earliest and most treatable stage. In the context of college student drinking, student’s might vary in their level of self-efficacy about consuming a particular number of drinks per occasion, or remaining abstinent from alcohol for a certain number of days per week or month. This concept is highly variable among individuals in that each student may have different idea about what level of drinking is necessary to avoid negative consequences or to remain in optimal health. The literature supporting self-efficacy as an accepted construct of the health belief model is growing especially when the targeted health behavior is one that involves modifying lifelong habits like engaging in safe sex or adopting an exercise and diet routine(Janz et al., 2002). However, there is a need for further study of this construct as it relates to the health belief model. Both cues to action and self-efficacy are additional components to the health belief model

that have not yet been fully validated. More research is needed to substantiate these portions of the model. As such, they will not be included for the current study.

Each of the constructs of the health belief model represents a distinct concept about how an individual's behavior is influenced. Separately, they make intuitive sense in explaining the thought process of people choosing unhealthy behaviors in lieu of healthy ones. Together, they constitute a model to be used as a basis for understanding individual perceptions and predicting the adoption of preventative measures (Rosenstock, 1974). Figure 1 provides a visual representation of the health belief model. In the following section, I focus on how these individual constructs of the health belief model have been studied and validated over the years to create the conceptual model used today.



Adapted from http://www.nursing-informatics.com/N4111/change_theories.html

Figure 1. Health Belief Model

Developing and Validating Constructs of the Health Belief Model (HBM)

Although Hochbaum (1958), Kegels (1963), and Rosenstock (1966) first began forming and introducing the concepts of the Health Belief Model in the 1950s, it was not until the 1970s that researchers began to focus on validating the constructs of the model in order to develop a reliable and valid measuring instrument. In 1977, Maiman, Becker, Kirscht, Haefner, and Drachman addressed the critiques of research using the Health Belief Model, such as lacking information on reliability and validity and testing the model as a whole as opposed to testing its separate constructs. Maiman et al. (1977) used a stepwise multiple regression to evaluate the entire Health Belief Model, tested each index or construct for internal consistency, and examined relationships among belief dimensions.

Maiman et al. (1977) analyzed the psychometric properties of a potential Health Belief Model instrument used to understand the health beliefs of mothers whose children were overweight. A questionnaire was designed using the constructs of the Health Belief Model (i.e., perceived susceptibility, perceived severity, perceived benefits and perceived barriers). The researchers reported internal consistency using gamma coefficients and found that “coefficients above .90 were obtained for some indices of susceptibility and severity, for the combined indices of overall health concern, and for general health threat” (p. 223). The authors stated that the stepwise multiple regression test use of the HBM constructs together accounted for 39% of the variance at the first data collection point and 24% at the second data collection point. These researchers

took the first steps of validating HBM constructs by establishing that components of the model held reliably together.

Cummings, Jette, and Rosenstock (1978) continued the task of validating the HBM constructs in their study of perceived susceptibility and perceived severity of contracting the flu among 85 graduate students. Specifically, the authors sought to empirically demonstrate the construct validity of the HBM as well as measure how valid current techniques were for measuring health beliefs and whether or not the model's components were independent of each other. They used the multi-trait multi-method scheme of establishing construct validity described by Campbell and Fiske (1959). The researchers tested the constructs using three formats: a 7-point Likert scale, fixed-alternative multiple choice, and vignettes. Using the multi-method scheme "the observed correlations between measures of the same trait [i.e., construct] using different methods should be greater than the correlations between measures of different traits using the same method" (Cummings et al., 1978, p. 397). In other words, to establish construct validity, the correlation between perceived susceptibility as measured by Likert scale, perceived susceptibility as measured by multiple-choice, and perceived susceptibility as measured by vignette should be higher than the correlation between all the Likert scale scores between perceived severity, benefits, and barriers. This method determines whether each construct is independent of the others. The authors concluded that the Campbell and Fiske method was "awkward to interpret" and was "unable to provide precise methods of construct validity" (p. 399). Therefore, the

researchers used an additional method, structural equation modeling (SEM), to supplement the limitations of the Campbell and Fiske method.

Cummings et al. (1978) found substantial convergent validity between perceived severity, perceived susceptibility, perceived barriers, and perceived benefits. The Likert method had an average validity coefficient of 0.82 which was slightly superior to the multiple-choice method with a validity coefficient of 0.71. The vignette method, having only 0.09 validity coefficient, was not recommended as a feasible method for measuring health beliefs (Cummings et al., 1978). Discriminant validity for the model also was addressed. Perceived susceptibility and perceived severity were found to be considerably different from perceived barriers and perceived benefits, a similar finding of Maiman et al. (1977). Cummings et al. discovered that a moderate positive correlation (.313) existed between perceived susceptibility and perceived severity, indicating some overlap among the two. Indeed, subsequent researchers have combined perceived susceptibility and perceived severity to create a composite variable, perceived threat (Janz et al., 2002). A considerable negative correlation (-.655) between perceived barriers and perceived benefits suggested that these two constructs represent two ends of the same spectrum and not two distinctly separate health beliefs. Cummings et al.'s work on validating the HBM is noteworthy: They replicated Maiman et al.'s (1977) findings of discriminant validity between the first two constructs, perceived benefits, and perceived barriers; further validating the HBM constructs after reliability had been established.

Once the model itself had been validated, Jette, Cummings, Brock, Phelps, and Naessens (1981) sought to differentiate the reliability and validity between health belief instruments that assess condition-specific maladies (e.g. “How serious would it be if you were diagnosed diabetic?”) as opposed to those that inquire about non-specific health events (“When you get sick, does it seem to be very serious?”) The study consisted of two samples with similar demographics (Sample A: $n = 282$, Sample B: $n = 307$). Through the use of exploratory factor analysis, the researchers found eight interpretable factors (general health threat, barriers, severity, trust in doctors, susceptibility, health status, locus of control, and health concern) that accounted for 37% of total variance. The estimated index reliabilities, using the Spearman-Brown formula, ranged from .389 to .781 for the two samples.

Limitations of the Jette et al. (1981) study were that reliability indexes varied across the two groups. The researchers attributed this to measurement error or the absence of a normal distribution. Jette et al. accounted for this in part by dividing the samples by the median age and comparing samples by age group. They found “a clear separation of condition-specific and general measures of perceived susceptibility for the younger respondents” (p. 91). This finding supported the researchers’ assumption that older individuals would probably perceive themselves as susceptible to a wider range of illnesses because of general health deterioration that can occur with age. This is an important finding to bear in mind for the present study because I purport to test individuals in late adolescence/early adulthood about condition-specific issues (alcohol

abuse and alcohol dependence). If the age of respondents has a bearing on how they perceive susceptibility to disease, the participants of the current study may have a lower than average perceived susceptibility to any condition based on their youth and perceptions of invulnerability. Jette et al. (1981) further found that the HBM constructs were sufficiently distinct enough to be considered separate beliefs, echoing earlier findings (Cummings et al., 1978; Maiman et al., 1977).

Champion (1984) furthered the development of an instrument to test the HBM constructs. Whereas previous researchers intended to validate instruments that were currently in use and standardize operational definitions across studies, Champion focused on developing an instrument to “investigate the attitudinal components of health-related behaviors” (p. 73) in order to further the practice of nursing, specifically related to breast cancer self-examinations using a sample of 301 women. The researcher used the theory of measurement error as a basis for work on reliability.

Champion (1984) stated four hypotheses for this study: (a) Internal consistency reliability coefficients for susceptibility, seriousness (severity), benefits, barriers, and health motivation are $> .7$; (b) correlation coefficients for the test-retest reliability on susceptibility, seriousness (severity), benefits, barriers, and health motivation are $> .7$; (c) concepts of susceptibility, seriousness (severity), benefits, barriers, and health motivation are mutually exclusive; and (d) the combination of susceptibility, seriousness (severity), benefits, barriers, and health motivation are related to frequency of breast self-examination. The researcher developed 20–24 items each for susceptibility,

seriousness (severity), benefits, barriers, and health motivation. A team of 8 faculty and doctoral students knowledgeable about the HBM were asked to rate which items belonged to which construct. Items in which 6 out of 8 reviewers agreed on the classification were included in the questionnaire given to participants.

For hypothesis 1, Cronbach's alpha was used to compute initial reliability by establishing internal consistency across the five construct areas. Hypothesis 1 was accepted for susceptibility, seriousness (severity) and barriers; but rejected for benefits and health motivation because of coefficients .61 and .60, respectively (Champion, 1984). For Hypothesis 2, test-retest reliability was done using a sample of 57 of the original 301 women. This hypothesis was supported for susceptibility, seriousness (severity), barriers, and health motivation as correlation coefficients were found to be $> .7$. However, the benefits scale did not meet the .7 threshold but was found to be significant at the $p \leq .001$ level. Hypothesis 3 was tested using factor analysis, and the result replicated the findings of earlier studies (Cummings et al., 1978; Jette et al., 1981; Maiman et al., 1977), suggesting that the model's components were found to be distinct from each other. Champion (1984) found that all items on a factor were from the same construct, except one. Hypothesis 4 was tested using multiple regression and accepted as the combination of the constructs did predict the frequency of breast self-examinations. Champion's (1984) research addressed issues of content validity by having a review panel select items based on the HBM theory, as well as construct validity.

Research on the HBM constructs has continued to find that the constructs of the HBM are independent of one another (Cummings et al., 1978; Jette et al., 1981; Maiman et al., 1977) This finding was again replicated in Carpenter's (2010) meta-analysis of studies looking at the effectiveness of HBM variables in predicting behavior. He found that benefits and barriers emerged as the strongest predictors, with severity being weak but in the direction predicted and susceptibility being unrelated to behavior. An important finding to note was that there seemed to be increased effectiveness when using HBM constructs in predicting behavior when the goal was prevention of a negative health outcome as opposed to an attempt to get individuals to comply with a treatment regime for an existing condition (Carpenter, 2010). This finding provides a specific indication as to the timing of when an intervention is most likely to be effective.

Weissfeld, Brock, Kirscht, and Hawthorne (1987) were the first researchers to use confirmatory factor analysis methods for establishing the structure of factors of the health belief model. Up to this point, researchers had typically employed exploratory factor analysis. The authors sought to confirm the internal consistency of the model by administering a questionnaire with 32 items hypothesized to measure HBM constructs to participants in different demographic subgroups. Two-thousand, eight hundred and two participants randomly selected in a Michigan Blood Pressure Survey were administered a HBM questionnaire by trained interviewers. The authors began by employing an exploratory factor analysis, in which six significant factors were identified: general health motivation/concern, general health threat, susceptibility, severity,

benefits of medical care, and self-help benefits. Limitations of Weissfeld et al.'s (1987) research include variability with the identified factor loadings not matching the theoretical components initially identified in the original and updated health belief model. Some items from the original model, such as barriers, were omitted completely from the factors while others, such as self-help benefit, were added without rationale to the model's established constructs.

As a result of these limitations, the authors reported that they only had one item to assess barriers, and thus were unable to confirm or replicate the finding in the Cummings et al. (1978) study stating that barriers and benefits existed as two ends of a continuum of beliefs. However, Weissfeld et al.'s (1987) findings highlighted the fact that research on the Health Belief Model is difficult to execute without referring to a specific condition. The authors used survey questions on their HBM instrument that focused on a variety of different health issues: hypertension, heart attack, kidney disease, and cancer. The fact that their factors did not fit the theoretical health belief model may be due to the questions assessing general health and illness as opposed to a specific disease or condition.

Indeed, Weissfeld et al. (1987) asserted that development of a standard, flexible, widely useful instrument to measure HBM variables had not, up to that point, been fruitful. In part, this difficulty arose because of the need to "target the content of questionnaires to specific health behaviors, disease states, and populations" (p. 787). Indeed, reliable and valid HBM instruments have been established (Champion, 1984;

Saleeby, 2000) when they have been focused on a specific health condition (e.g. breast cancer, mental illness) and crafted to fit the theoretical constructs of the Health Belief Model. Research on the constructs of the HBM has aided the development of more reliable and valid measures, and further research will continue to validate existing measures and provide structure and a framework for new measures for different conditions.

The development and validation of the HBM constructs has been an ongoing area of research, primarily beginning in the 1970s. As such, the HBM has been substantially studied and continues to be refined and perfected as the HBM constructs are applied to various illnesses and disorders. The research to date on the HBM suggests that the theoretical constructs are valid when HBM items are constructed based on the original theoretical meaning and are applied to specific conditions (Jette et al., 1981; Maiman et al., 1977; Weissfeld et al., 1987). The next chapter will provide further information about a specific instrument, incorporated into the current study, designed to assess alcohol and drug beliefs using the Health Belief Model constructs.

Applications of the Health Belief Model

The health belief model (HBM) was designed to help public health practitioners understand the limited success of testing and interventions known to prevent the contraction of certain preventable conditions (Janz et al., 2002; Rosenstock, 1966). By applying the model to the problem of collegiate alcohol abuse and dependence, it is possible that the HBM can help explain the structure of certain belief systems that

college students hold in terms alcohol consumption, and how these beliefs may mediate the well-established relationship between social norms and heavy alcohol use. That is, the HBM has the potential to help identify significant thoughts or beliefs about drinking that college students' hold and their relationship and potential mediation influence to problematic drinking behavior. The purpose of the health belief model is to understand individuals' beliefs about their lack of participation in preventative practices or pre-emptive screenings designed to lower the risk of being diagnosed with a condition (Janz et al., 2002; Rosenstock, 1966), in this case alcohol dependence or abuse, through early intervention. In this section, an overall review of ways in which the health belief model has been applied in diverse populations to varied health conditions is presented, concluding with the use of the model in college populations and specific to alcohol use.

General use of the HBM. The health belief model has been used as a theoretical framework for health related research around the globe. White (2004) used HBM to conceptualize Jamaican adolescent condom use by understanding the barriers they faced, the benefits they endorsed, and the self-efficacy of the youths. Knight and Hay (1989) applied the model to Australian smokers. Manu and Sriram (1999) used it to study AIDS preventive behaviors in a population of Ghanaian college students. Three studies in particular demonstrate the predictive ability of the HBM for specific health behaviors and will be reviewed below.

In 2008, Lachter and Epel-Baron used the HBM to understand colon cancer screening behaviors in first-degree relatives of colorectal cancer patients. They found

that lack of understanding of the screening importance and fear of screening process were both factors in why first-degree relatives would avoid screening. Their results indicated that demographically, female were more likely to be screened than males and that Jewish people, educated people, and those with higher incomes were more likely to be screened indicating that efforts should be made to encourage screening in poor, non-Jewish, and less educated people.

Manu and Sriram (1999) focused on increasing AIDS-preventive behaviors in students, including wearing condoms, having sex less often, having fewer sex partners, and carrying condoms in case of sexual behavior. Findings indicated that self-efficacy scores were lower for females than males, partly due to cultural differences among the African sample and Westerners. It was also found that a general lack of knowledge about AIDS and AIDS-preventive behavior was evident among the samples. Manu and Sriram (1999) reported the need for better focused AIDS communication campaigns, especially those with messages designed to increase self-efficacy in women seeking to engage in AIDS-preventive behavior.

In 2007, Schmeige, Aiken, Sander, and Gerend published a study where the health belief model, social cognitive theory, and the theory of planned behavior were applied to osteoporosis-preventive behavior among young women. They found that perceived barriers, self-efficacy, and descriptive norms all predicted intentions to engage in preventive behaviors (i.e., consuming calcium and exercising). In their path model, perceived benefits of exercise was statistically significant in relation to intention

to exercise. Both societal descriptive norms for exercise and injunctive norms for exercise were both statistically significant as they related to self-efficacy for exercise (Schmiege, Aiken, Sander, & Gerend, 2007). Another important function of their study was looking at the predictive utility of the HBM by comparing beliefs and behaviors at two data collection points (wave 1 and wave 2). They found that only the barriers construct from the HBM was a significant predictor of behavior. The researchers believed in part that this could have been because of the distal nature of osteoporosis to the sample of college women aged 17-25. The distal nature of osteoporosis, a condition that typically affects post-menopausal women, could have had some bearing on low perceived susceptibility and severity.

The results found by Schmeige et al. (2007) and Manu and Sriram (1999) provide a precedent for combining the health belief model with expectancy-value theories such as social norms, social cognitive theory, and the theory of planned behavior. Both studies utilized individual measures of perceived susceptibility, severity, benefits, barriers, and self-efficacy and related them to how overall media messages (e.g. social norms media campaigns) relate to individual perceptions held by a specific target population. In Lachter and Epel-Baron (2008) information was gathered that showed a clear indication that non-Jewish, less-educated, poor people were more in need of encouragement to engage in colorectal cancer screening. This type of information can help tailor injunctive messages about health behaviors to target populations that are more defined (i.e., proximal) and supported by research.

Mental health application of the HBM. The health belief model has emerged as a theoretical base for studies of mental health issues, in addition to its traditional application of understanding motivations and behaviors related to physical health issues such as colon cancer screenings or mammograms for early detection of breast cancers. Cremeens, Usdan, Brock-Martin, Martin, and Watkins (2008) studied how parent-child communication served to reduce heavy drinking in college freshmen guided by the constructs of the HBM. However, rather than discussing perceived susceptibility with the students themselves, the authors chose to survey parents about their beliefs about their child's susceptibility to heavy use of alcohol. Cremeens et al. found that 66.2% of parents reported "more than 10 talks with their child about alcohol" (p. 157). Parents' top two reasons for initiating conversations about alcohol were because they knew someone with a drinking problem (27.3%) and because their child was leaving for college (14.4%). Other reasons included a news/media story (10.8%), catching their child drinking (6.7%), or having had their child come home intoxicated (2.2%). The authors focused on the parents' perceptions of their children's susceptibility to an alcohol diagnosis rather than the child's perceptions of severity and susceptibility. Whereas Cremeens et al. used the HBM and intervened through parents, the current study is designed to understand an individual student's perception about his or her perceived susceptibility to an alcohol use disorder. Indeed, Iverson (1978) was one of the first to investigate drug and alcohol use via the HBM model by providing direct feedback to adolescents and young adults, rather than parents.

Iverson (1978) focused on strategies to communicate directly to adolescents when creating programming designed to address their drug and alcohol behaviors. He called for drug and alcohol prevention programs to be developed around and grounded in a health behavior model as a way to enhance evaluation of the program. He proposed a model program for drug prevention activities designed to influence preventative health behaviors using methods that did not include scare tactics, but were shaped by the audience's perception of reality. The author posited that the Health belief model was an ideal theoretical base for such programming because the HBM takes current perceptions into account. He stated that students are likely to dismiss what they feel are scare tactics. Iverson's (1978) article spurred a dialogue about how best to address the problematic drinking in adolescent and young adult populations. He promoted joining with college students as opposed to alienating them with information and material that did not seem salient or effective drinking deterrence strategies at that time.

Portnoy (1980) expanded on the concepts delineated by Iverson (1978) by conducting a study to determine the effects that a controlled-usage alcohol education program utilizing the HBM as a theoretical base would have on a university population. He sampled 271 students at a Midwestern university and studied their perceived susceptibility to alcohol abuse, general health motivation, alcohol intake, responsible use of alcohol, and attitude towards the educational program. The researcher used the HBM and select persuasive communication principles to devise an educational program for college students. Components of the program included cues to action, perceived

seriousness and perceived susceptibility of abusing alcohol, perceived benefits of responsible use, and perceived barriers of responsible use. The author incorporated persuasion strategies such as movies/media, sources similar to participants,(e.g. credible/respected peers), humor, face to face communication, and a positive approach.

Portnoy (1980) divided participants into two control and two experimental groups but found that none of the comparisons between the control and experimental groups were statistically significant. That is, no effect on individual drinking patterns was found. Analysis of the results indicated that all of the students in both the control and experimental groups reported alcohol use that was in the responsible range prior to participating in the educational program component of the study. Because alcohol use was already in a responsible range, detection of significant differences was unlikely. There was a finding of higher beer consumption in the control group, but this was still within the responsible range. Alcohol knowledge was significantly increased in the experimental groups between pre- and post-tests. However, perception of susceptibility was actually decreased from pretest to posttest. The author posited possible reasons for this: Subjects initially reported viewing alcohol problems as being extremely serious, and the program may have elicited “a denial response in terms of personal susceptibility” (p. 191).

Portnoy’s (1980) research has been criticized on a number of grounds. First, he incorporated additional variables including locus of control, self-esteem, peer and parental attitudes towards drinking, as well as peer and parental drinking behaviors in

his study; however, he did not report on how these variables were related to the interpretation of study results. The design of the educational program was intended to be used a source of information from which students could identify. Yet, as there were no outcome measures specifically analyzing how many the participants identified with the approach of the researcher, it is difficult to determine the effectiveness of specific components of the HBM educational program. Researchers seeking to replicate studies similar to Portnoy's may need to include all study variables into the results and analyses. Also, ensuring that participants in the study have a demonstrated pattern of irresponsible use may yield different results in terms of how successful an HBM-based program would affect drinking behaviors and perceptions in students.

More recently, researchers (Henshaw & Freedman-Doan, 2009; Smith, 2009) have focused on utilizing the HBM as it relates to mental health services. Henshaw and Freedman-Doan (2009) reviewed literature about utilization of mental health care services through the lens of the HBM. The authors posited that mental health care professionals can benefit from this knowledge by developing interventions that address "maladaptive attitudes or inaccurate beliefs about mental health and its treatment" (Henshaw & Freedman-Doan, 2009, p. 423). The HBM may serve as a platform for aiding mental health professionals in identifying and confronting any psychological barriers (i.e., stigma) potential clients may have.

Smith (2009) responded to Henshaw and Freedman-Doan's analysis by pointing out that the use of HBM applied to mental health, including addictions, is potentially

useful. For example, in the same manner that the HBM has historically been used to understand the beliefs of women who chose not to have mammograms to detect breast cancer, we can begin to understand beliefs of college students who choose not to seek treatment for serious alcohol problems such as dependence. Additionally, just as having the belief that one will not get breast cancer places a woman at risk, the belief that one will not become alcohol dependent, despite obvious heavy drinking in conjunction with other risk factors, places a student at risk. Individual student perceptions and beliefs about drinking could lead to serious consequences including hospitalization for alcohol poisoning and alcohol dependence. In the following section, I take a closer look and describe the application of the HBM to college student drinking as a means to explore the model's predictive value in understanding how beliefs factor into college students' choices about their alcohol consumption and behavior and how they mediate the connection between social norms and drinking.

Health Belief Model and College Student Drinking

Numerous screenings, approaches, and interventions for addressing college drinking through the use of electronic alcohol education media and during known windows of risk (e.g. Spring Break trips, 21st birthday celebrations, Homecoming or other home football games, etc.) have been implemented over the last few decades because alcohol abuse has surfaced as a major public health issue on college and university campuses (Gintner & Choate, 2006; Martens, Cimini, et al., 2007; Murphy, Correia, & Barnett, 2007; Neighbors, Walters, et al., 2007; Walters, Miller, & Chiauuzzi,

2005; Wechsler & Wuethrich, 2002). Some of these screenings, approaches, and interventions have been based on a theoretical foundation whereas others have not. Indeed, most research on college alcohol consumption has been atheoretical; that is, researchers have summarized the prevalence, consequences, and correlates of heavy alcohol use outside the context of theory. However, incorporating theoretical models into the study of college alcohol use provides greater explanatory power of the mechanisms that underlie drinking behavior, and paves the way for theory-based interventions. Sharma (2011) wrote an editorial proposing that the need for the health belief model being utilized in alcohol and drug education. Applying the health belief model, in conjunction with social norms, to the study of collegiate alcohol use could provide insight into the external and internal belief systems of college students and how these belief systems contribute to drinking behavior. Examining external and internal belief systems also may allow for the design of more targeted approaches to problematic alcohol use currently plaguing campuses around the country. Specifically, understanding the belief schemas of college students in regards to their drinking behaviors are integral to understanding how to design interventions that promote moderation and address the heavy drinker's social perceptions and perceived benefits and barriers to behavior change.

By viewing the problematic alcohol use through the lens of the health belief model framework, one can better understand why there are low levels of participation in university programs designed as alternatives to events that typically center on large

amounts of alcohol consumption (e.g. tailgating). The purpose of programs based on the HBM is to increase participation in services that reduce the risk of being diagnosed with a condition. Programs based on social norms data do not address this important purpose. The additional advantage of using the HBM in research on collegiate drinking is that its constructs provide information not only on the level of threat students feel for being diagnosed with a particular condition, but also the benefits and barriers to taking a specific health action. It seems that programs developed through student development and student affairs divisions have focused on providing alternatives to drinking, or have addressed typical drinking norms, without a full discernment of the actual benefits students find in their drinking activity, nor an appreciation of the barriers students face when not drinking (Gintner & Choate, 2006). Exploring the barriers and benefits is one of the key concepts of motivational interviewing in that systematically processing these two constructs serves as an intervention designed to increase internal motivation for change (Miller & Rollnick, 2002). The HBM provides a way to take the threat of a condition in addition to the benefits and barriers of taking action into account when conceptualizing health beliefs, understanding unhealthy behavior, and formulating prevention programs. Thus, by incorporating health belief constructs into already existing social norms programs, campuses have the potential to develop more comprehensive programs by addressing both external (social norms) and internal (health beliefs) perceptions external (social norms) and internal (health beliefs) that impact health behavior.

Von Ah, Ebert, Ngamvitoj, Park, and Kang (2004) used the HBM to predict alcohol, smoking, and other general health behaviors in college students. They found that “perceived barriers mediated the effects of self-efficacy on binge drinking behaviour and smoking, whereas perceived barriers moderated the effects of self-efficacy on physical activity and nutrition behaviours and general safety behaviours” (p. 472). For students who had high perceived threat, self-efficacy was moderated by perceived threat for alcohol use at 30 days and again at 6 months. For those individuals with low perceived threat, self-efficacy was mediated by perceived barriers for smoking behaviour and general safety protective behaviours (Von Ah et al., 2004). Their results also indicated that the higher level of barriers students listed, the more likely they were to engage in negative behaviors like increased drinking and smoking, reduced time doing physical activity, poorer nutrition choices, and less general safety behaviours (e.g. wearing sunscreen; Von Ah et al., 2004). The researchers concluded that future health promotion programs with college students should use interventions that maximize self-efficacy and ultimately reduce barriers to making healthy lifestyle choices (e.g. reducing drinking from binge levels to non-binge levels).

Von Ah et al.’s (2004) study results highlighting perceived barriers as an important construct in understanding the health behaviors of college students echoed similar findings by Grubbs and Carter (2002). An important finding from this study was that reduction in perceived barriers to exercise was the most influential factor for the total number of minutes spent exercising per week in college students (Grubbs & Carter

2002). The lack of exercise among students was true even when they possessed first degree relatives with heart disease, hypertension, and high cholesterol. Having a family history of cardiovascular diseases that are largely preventable by exercise and diet and this not having a significant effect on perceived susceptibility and severity further illustrates the need to meet students where they are in terms of eliminating barriers to healthy behaviors.

There is little information on specific barriers college students espouse for curtailing their heavy drinking. Portnoy (1980) attempted to use the HBM as a basis for designing an educational program but actually placed less emphasis on understanding individual perceptions, which is an important component of the HBM. What is currently known about college student drinking has yielded poor results in identifying a long-lasting and tenable solution to this issue. Even as social norms theory has provided a sound structure for understanding the reasoning and mechanisms for heavy drinking and an approach to decrease it, there also are clear disadvantages and problems with population level interventions that characterize many social norms media campaigns designed to reduce drinking. Nigg and Jordan (2005) stated,

potentially the most compelling rationale for *simultaneously studying multiple theories* may not be to hold experimental horse races, but rather to *empirically integrate salient components of theories* [emphasis added] in an effort to create a more complete or holistic theory of behavior change. (p. 292)

The tactic of utilizing an individualized approach to understanding drinking behavior (HBM), combined with already established social norm models, warrants further inquiry.

Summary

College students have continued to drink at abusive levels despite decades of research promoting awareness of the problem and the myriad of negative consequences students themselves experience as a result (NIH, 2004; Wechsler, Dowdall, Davenport, & Castillo, 1995; Wechsler & Wuethrich, 2002). Although the social norms theory has offered an innovative approach to providing students with normative information designed to reduce drinking to actual norms instead of perceived norms, reports of effectiveness are inconsistent and depend largely upon the type of norm being researched in a study and whether or not the messages are positively received and internalized by the target audience (Berkowitz, 2004; Borsari & Carey, 2003; Clapp et al., 2001; Granfield, 2002). The health belief model may possibly offer constructs that, in addition to the strengths of social norms theory, together provide a synergistic effect by combining individual perceptions of health beliefs and data from more distal relationships. The health belief model construct of perceived barriers has been shown to be a highly effective predictor of behavior in the college population (Grubbs & Carter, 2002; Von et al., 2004). Additionally, a precedent for combining theories to produce more holistic and complete models of behavior has been established in previous literature (Manu & Sriram, 1999; Nigg & Jordan, 2005; Schmeige et al., 2007).

CHAPTER III

METHODOLOGY

The purpose of this chapter is to delineate the methods and procedures that will be used to execute this research study. Topics for discussion in this chapter will include research questions and hypotheses, procedures and description of the sample to be studied, evaluation of the instrumentation, and description of the statistical analyses employed to address the research questions. Finally, the researcher also will provide results from the pilot study designed to reveal any problems in sampling, data collection, and study procedures before the full study is conducted.

Research Questions and Hypotheses

The objective of this research study is to explore the relationships between social norms, health beliefs, and problematic drinking among college students. A second objective is to determine if social norms and health beliefs explain variance in problematic drinking above and beyond demographic factors that have been known to be associated with heavy drinking among college students. The final objective is to determine if health beliefs mediate the relationship between social norms and problematic drinking. Based on the constructs of social norms and the health beliefs model (HBM), the following research questions were devised to gain insight into the above mentioned goals of the study. The hypotheses listed under each research

question are based on a thorough evaluation of the literature pertaining to college student beliefs about alcohol.

RQ1. What are the relationships among (a) social norms (quantity norms and frequency norms), (b) health belief components (susceptibility, severity, benefits, and barriers) and (c) problematic drinking among a sample of college students?

RQ1a: What is the relationship between social norms (quantity and frequency norms) and problematic drinking among a sample of college students??

Hypothesis 1a: There will be significant, positive correlations between social norms and problematic drinking among a sample of college students.

RQ1b: What is the relationship between health belief components (susceptibility, severity, benefits, and barriers) and problematic drinking among a sample of college students?

Hypothesis 1b: There will be significant relationships between the health belief components and problematic drinking among college students. Specifically, there will be a significant negative relationship between perceived susceptibility and problematic drinking. There will be a significant, negative relationship between perceived severity and problematic drinking. There will be a significant, negative relationship between perceived benefits and problematic drinking. There will be a significant, positive relationship between perceived barriers and problematic drinking.

RQ2: Do social norms (quantity and frequency norms) and health belief components (susceptibility, severity, benefits, and barriers) predict a significant amount of variance in problematic drinking among a sample of college students?

Hypothesis 2: Social norms and health belief components will account for a significant amount of variance in problematic drinking among college students. Specifically, both theoretical constructs will contribute significantly to the regression model.

RQ3: Do social norms (quantity and frequency norms) and health belief components (susceptibility, severity, benefits, barriers) predict a significant amount of variance in problematic drinking above and beyond selected socio-demographic variables known to be associated with college drinking among a sample of college students?

Hypothesis 3: Social norms and health belief components will predict a significant amount of variance in student problematic drinking above and beyond selected socio-demographic variables.

RQ4: Do the components of the health beliefs model (susceptibility, severity, benefits, barriers) mediate the relationship between social norms (quantity norms and frequency norms) and problematic drinking among a sample of college students?

Hypothesis 4: A student's health beliefs (perceived susceptibility, severity, benefits, and barriers) will each mediate the relationship between quantity norms and problematic drinking and frequency norms and problematic drinking.

Participants and Procedures

The population of interest in this study is undergraduate men and women of traditional-age (aged 18–24) enrolled in two universities in the Piedmont-Triad region of North Carolina. Part-time (less than 12 credit hours a semester) students and adult students (those aged 25 and older) will not be eligible for participation. One university is a mid-sized public institution and the other is a small private university. These institutions were chosen as data collection sites for the ethnic and socioeconomic diversity of the individuals, as well as diversity in campus type (i.e., public vs. private).

The sampling procedure will consist of convenience based methods, in which select courses will be approached following obtaining instructor permission (sample script of oral recruitment included in Appendix A). The researcher will travel to individual class sections to provide a brief description of the purpose of the study and to solicit participants. Course instructors will be asked to allow the researcher to come at an appropriate time during class, so that students who do not meet criteria for the study (e.g. non-traditional age) or who choose not to participate may either leave while the study is being conducted, or engage in an activity approved by the instructor (e.g. reading). The selection of courses at both universities will be based on enrollment representing a wide range of students across racial identity, year in school (freshmen through seniors) and academic majors. Both universities are coeducational, residential establishments located in the same region of the United States. Aside from these general similarities, the universities differ on several aspects. One is a public university

enrolling about 18,500 undergraduate students (34% male, 66% female) (Undergraduate Admissions, 2011) and has a minority enrollment of 27%. The cost for full-time students living on-campus is approximately \$11,000 per academic year for in-state students and around \$23,000 for out-of-state students. The other institution is a private liberal arts school with a little over 4,000 undergraduates currently enrolled (Office of Undergraduate Admissions, 2011a). The 2011-2012 cost of attendance totaled \$56,236 (Office of Undergraduate Admissions, 2011b). The universities are close in proximity but provide differences in the student body characteristics and makeup. The intention of choosing these two universities as sampling locations was due to their proximity to the researcher as well as the differences in university type; potentially offering an opportunity to collect data on social norms, health beliefs, and problematic drinking from as diverse a group of college students as possible.

A target sample of 200 students (100 from each university) will be recruited for participation by the researcher soliciting participation in individual classes. A sample size of 200 was decided upon to provide enough power for data analysis after running a power analysis using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009). The power analysis using G*Power indicated that a sample size of 111 would be needed for each of the correlations (Research Questions 1, 1a, and 1b) and a sample size of 184 would be needed for a multiple regression (Research Questions 2 and 3). Although 200 participants is above these values, the researcher wanted to ensure sufficient power for the analyses should some data be incomplete and thus not usable in the data analyses.

Instrumentation

The measures for the current study include a researcher-developed demographic questionnaire, the Drinking Norms Rating Form (DNRF; Baer, Stacy, & Larimer, 1991), Alcohol Use Disorders Identification Test (AUDIT; Babor, de la Fuente, Saunders, & Grant, 1992), and the Health Beliefs for Mental Illness (HBMI) instrument (Saleeby, 2000). Participants will be asked to complete a total of 49 items (8 demographic items, 10 on the AUDIT, 10 on the DNRF, and the 21 Alcohol/Drug questions on the HBMI). The demographic questionnaire solicits information about key socio-demographic variables in the study including gender, ethnicity, Greek affiliation, university athletic team involvement, and age at first drink. The DNRF will be used to gather data about student perceptions of how much and how often their peers are drinking. The AUDIT will be used to assess student drinking behavior and identify problematic drinking among the sample. The HBMI will be used to identify student perceptions of susceptibility to and severity of alcohol use disorders and to gauge student perceptions of the benefits and barriers associated with more moderate alcohol consumption. Each of the measures is described below with emphasis on the validity and reliability.

Demographic Questionnaire

A demographic questionnaire generated by the researcher will be given to participants to solicit information about age, race/ethnicity, and gender. The demographic form also will have a question inquiring about student athlete status (e.g. Are you a member of a university NCAA athletic team (not club sports)?) and whether or

not the participant is a member of a social Greek life fraternity or sorority (e.g. Are you a member or pledge of a fraternity or sorority on campus?). The items that comprise the demographic questionnaire are based on the college student drinking body of literature which points to several key socio-demographic variables as predictive of drinking behaviors. The demographic items also will play a key role in data analyses (RQ #3).

Alcohol Use Disorders Identification Test (AUDIT)

The AUDIT is a 10-item assessment developed by several researchers for the World Health Organization (WHO) and validated on 1,888 primary care patients in six countries (Ash, 1996). The purpose of the AUDIT is listed in the 14th Mental Measurement Yearbook as being “a screening procedure to identify persons whose alcohol consumption has become hazardous or harmful to their health” (Plake & Impara, 2001, p. 51). Its focus is on early identification of alcohol use disorders in adults. I chose the AUDIT for use in the current study for its validation on a sample similar in demographics to the population for the current study, reliability and validity information, and its brief nature.

The AUDIT has been studied and validated on college samples and has been shown to be accurate in detecting alcohol dependence among university students (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001; Fleming, Barry, & MacDonald, 1991; Kokotailo et al., 2004). Kokotailo et al. (2004) studied 302 college students seeking services at their university health center. The authors found that the AUDIT was effective at identifying not only students who met alcohol abuse or dependence criteria,

but those who engaged in high risk drinking behaviors below the threshold required for alcohol use diagnoses. Kokotailo et al. (2004) also provided information about the ideal cutoff scores of the AUDIT (6-8) for identifying students who are high-risk drinkers.

The AUDIT was developed as a brief screening tool for excessive drinking in primary care (i.e., medical) settings (Babor et al., 2001) and the items are consistent with the ICD-10 and DSM-IV-TR definition of alcohol dependence. Each question on the AUDIT forces an answer on a scale of 0-4. For example, "How often during the last year have you been unable to remember what happened the night before because you had been drinking?" Possible participant responses include 0 = *Never*; 1 = *Less than monthly*, 2 = *Monthly*, 3 = *Weekly*, and 4 = *Daily or almost daily*. Scores are simple sums of item responses and can range from 0 to 40. Scores of 8 or more suggest hazardous or harmful alcohol use and scores of 20 or above strongly suggests alcohol dependence (Babor et al., 2001).

A strong correlation between the AUDIT and the Michigan Alcoholism Screening Test (MAST) was found ($r = .88$) by Bohn et al. (as cited in Babor et al., 2001) demonstrating that concurrent validity with other instruments is present. Test-retest reliability was found to be $r = .86$ in a sample of non-hazardous drinkers, cocaine abusers, and alcoholics (Babor et al., 2001). Dybek et al. (2006) stated that because of the instrument's validation across several countries, it could be an even more reliable indicator of problem drinking patterns among minority populations than similar instruments that have not been validated across ethnic lines. Ash (1996) reported that

construct validity for the five risk factors, four drinking consequences, and three drinking attitudes assessed by the AUDIT demonstrated significant correlations ($r = .27$ to $r = .98$). It also was found that the correlations were slightly lower for females ($n = 91$) than for males ($n = 107$; Ash, 1996). The AUDIT is highlighted as an exceptional instrument by the Alcohol and Drug Abuse Institute [ADAI] at the University of Washington (ADAI, 2012a). This indicates that an instrument has been endorsed by various expert sources; in the case of the AUDIT those sources include the American Psychological Association, National Institute on Drug Abuse, and the World Health Organization for proven research validity and clinical utility (ADAI, 2012a). For the purposes of this study, the AUDIT was selected to serve as a brief instrument that has been validated on the college population and shown effective at differentiating problematic from non-problematic alcohol use with special sensitivity to diversity.

Drinking Norms Rating Form (DNRF)

The Drinking Norms Rating Form was designed by Baer et al. (1991) as an extension of the Daily Drinking Questionnaire [DDQ] (Collins, Parks, & Marlatt, 1985) to have respondents consider different groups of people and “rate typical or average drinking for persons in that group” (Baer et al., 1991, p. 582). The researchers were studying how often students were found to misperceive the drinking norms of their peers and found that students almost always perceive the drinking of others to be higher or more frequent than their own drinking behavior (Baer et al., 1991). The DNRF

has been found to have both face validity as well as predictive utility (ADAI, 2012b; Baer et al., 1991; Kypri & Langley, 2003; Larimer et al., 1997).

The DNRF is a 10-item assessment with two parts to the last eight items. It begins by asking students about their current living environment (residence hall, Greek housing, with parents, or own residence) and then inquires about their expected living environment for the next semester. For the next 8 questions, respondents are instructed to estimate both *how much* and *how often* 8 different reference groups (e.g. “average university student,” “average college student residing in a fraternity”) drink and are asked to think specifically about members of their own gender as opposed to opposite-gender drinkers. When participants are asked *how much* a reference group drinks on a typical weekend evening, they are asked to select from a range of “0” (no drinks) to “6” (more than 8 drinks). When asked *how often* a reference group drinks, participants are to select from a range of “1” (less than once a month) to “7” (once a day). As such, the DNRF provides two social norm subscale scores, one for *quantity norms* (how much does a particular reference group drink) and one for *frequency norms* (how often does a particular reference group drink). For each subscale (quantity and frequency), the 8 items are averaged to establish a quantity norms and frequency norms score for each participant in the study. The DNRF does not provide an overall, or total, social norms score (ADAI, 2012b). Quantity norms and frequency norms comprise the “social norms” variable in the current study, and both subscale scores will be used in data analyses. The DNRF will be used in this study to gauge student perceptions of how

much and how often their peers are drinking. Encouraging students to think about reference groups from their own gender is thought to increase the degree of closeness to the participant (Larimer et al., 2011).

Reliability. Broadwater, Curtin, Martz, and Zrull (2006) found the D NRF to have a test-retest reliability of .69. In a study looking at gender-specific misperceptions, Lewis and Neighbors (2004) used two versions of the D NRF. The gender-specific version assessed student perceptions of norms for a typical student of their same sex and the gender-nonspecific version simply asked students to think about the drinking behaviors of their fellow students regardless of gender. Lewis and Neighbors (2004) sampled a group of 226 undergraduate psychology students (51% women, 94% Caucasian). The researchers reported an internal reliability (Cronbach's alpha) as .76 for the gender nonspecific and .80 for the gender specific version (Lewis & Neighbors, 2004). The version that will be used in the current study is the gender specific version of the instrument. Neighbors, Dillard, Lewis, Bergstrom, and Neil (2006) also report good 2-month test-retest reliability ($\alpha = .70$) for perceived quantity norms.

Some researchers have modified the reference groups of the D NRF to be more proximal to respondents (Broadwater et al., 2006; Kypri & Langley, 2003) because it has been established that self-other discrepancies in drinking behavior are lowest when a specific rather than general reference group is used (Borsari & Carey, 2003). Several studies on social norms in college students have utilized the D NRF in assessing

perceptions of peer drinking behavior (Broadwater et al., 2006; Kypri & Langley, 2003; Larimer et al., 1997, 2011; Neighbors, Lee, et al., 2007).

Health Beliefs about Mental Illness (HBMI) Instrument

The Health Beliefs about Mental Illness (HBMI; Saleeby, 2000) is a 48-item instrument designed to gain “an understanding of persons’ health beliefs regarding mental illness” (p. 84) in order to develop and promote more targeted mental health interventions and programs. The Health Beliefs about Mental Illness instrument measures the four main constructs of the Health Belief Model (perceived susceptibility, perceived severity, benefits, and barriers) across the specific conditions of emotional/nervous problem or alcohol/drug problem. The HBMI was developed in 2000 by Jacqueline Saleeby and based on Champion’s (1984) instrument assessing the health beliefs of breast cancer research patients. The HBMI is the only instrument found that applies Health Belief Model constructs to issues related to emotional/mental health and alcohol/drug use. I chose to use the HBMI for the current study because of its development based on Champion’s (1984) validated HBM measure, its content and construct validity, and its alcohol and drug use component. For purposes of this study, only the alcohol and drug use component will be used.

The HBMI utilizes a Likert-type scale where 1 = *strongly disagree* and 5 = *strongly agree*. Score ranges depend on the number of questions per scale. For example, the Alcohol/Drug Susceptibility scale has five items, so possible scores range from 5-25. Higher scores on the susceptibility scales indicate stronger perceived risk of developing

an alcohol/drug problem or an emotional nervous condition (Saleeby, 2000). High scores on the severity subscale represent “a high degree of personal threat related to having a mental illness” (p. 86). High scores on the benefits scales indicate a person’s belief that seeking help for a mental illness would be advantageous. High scores on the barriers subscales represent an aversion to seeking mental health treatment. The Alcohol/Drug Susceptibility scale has 5 items (scores ranging from 5-25), the Alcohol/Drug Severity scale has 7 items (scores ranging from 7-35). The Alcohol/Drug Benefits scale has 4 items (scores ranging from 4-20) and the Alcohol /Drug Barriers scale has 5 items (scores ranging from 5-25). The HBMI does not have a total score; the subscales can be analyzed independently and compared.

Psychometric evaluation. Saleeby (2000) collected data on 123 subjects in two phases, phase A ($n = 81$) and phase B ($n = 42$). In phase B, all 42 respondents completed the instrument twice to gather information about one week test-retest reliability. The participants ranged in age from 23 to 65 in phase A and 21 to 53 in phase B. Fifty-three percent (53%) of respondents identified as Caucasian and 46% were African-American in phase A, and women made up 88% of the sample. Phase B subjects were entirely Caucasian and 93% female. The following sections provide information about the results of Saleeby’s validation of the HBMI.

Results of factor analysis. The HBMI has nine subscales falling under 2 categories: Emotional/Nervous and Alcohol/Drug. One additional subscale is the Health Motivation Subscale. For purposes of this study, only the Alcohol/Drug Subscale will be

used to assess HBM constructs; however, a comprehensive overview of the HBMI and how the different subscales loaded onto each factor is provided to allow the reader to understand the development of the HBMI. This overview is based on Saleeby's (2000) factor analytic work on the HBMI. Specifically, I will highlight the loading of items, which constructs fell under specific factors, information about the number of items on each factor, and the ranges for items loading onto each factor.

Factor 1. The first factor contains 10 items and encompasses the constructs Alcohol/ Drug Barriers and Emotional/Nervous Barriers. The construct of barriers is consistently measured by the 10 items, with five items assessing Alcohol/Drug barriers and the remaining five assessing Emotional/Nervous Barriers. Loadings for factor one ranged from .401 to .792.

Factor 2 and Factor 4. The second and fourth factors contain Emotional/Nervous Susceptibility and Alcohol/Drug Susceptibility, respectively. Each factor contains five items. Factor 2 loadings ranged from .817 to .894, whereas Factor 4 loadings ranged from .779 to .863.

Factor 3 and Factor 7. Factors 3 (9 items) and 7 (5 items) both contain items related to Alcohol/Drug Severity and Emotional/Nervous Severity. Factor 3 loadings ranged from .484 to .768, whereas Factor 7 loadings ranged from .412 to .819. One possible explanation for why Factors 3 and 7 both contain items of Alcohol/Drug Severity is the nature of the severity statements. Items that loaded onto Factor 3 seem to be related to how frightened or bothered a respondent would be about the prospect

of an alcohol/drug abuse or dependence diagnosis (e.g. HB39: “The thought of having drug or alcohol problems scares me.”) Items loading onto Factor 7 contained statements related to the length of time one believed they would have to deal with such a condition, or the overall life impact such a condition might have (e.g. HB32: “Difficulties I would experience with drug or alcohol problems would last a long time” or HB34: “If I had a drug or alcohol problem, my whole life would change.”). One section of statements (Factor 3) are related to the fear or concern an alcohol/drug diagnosis might cause whereas Factor 7 statements speak to the overall pervasiveness one perceives an alcohol problem would produce in their daily lives. Further analysis of these two factors may warrant consolidation.

Factor 5. The fifth factor encompasses Alcohol/Drug Benefits and Emotional/Nervous Benefits with factor loadings ranging from .478 to .784. Factor 5 has eight items split evenly between Alcohol/Drug Benefits and Emotional/Nervous Benefits. The fact that Factors 1 and 5 represented distinct differences between benefits and barriers in encouraging; some previous researchers (Cummings et al., 1978) have conceptualized benefits and barriers as a single construct existing as two opposite ends of the same continuum rather than two divergent constructs.

Factor analysis was used to determine construct validity for the HBMI (Saleeby, 2000). The final instrument yielded 48 items loading onto 7 factors. The HBMI has 9 subscales: Health Motivation (e.g. “I eat well balanced meals”), Emotional/Nervous Susceptibility (e.g. “I feel I will develop emotional/nervous problems in the future”),

Emotional/Nervous Severity (e.g. "I am afraid to think about emotional/nervous problems"), Emotional/Nervous Benefits (e.g. "Getting help for emotional/nervous problems would help me feel better about myself"), Emotional/Nervous Barriers (e.g. "Getting help for emotional/nervous problems is embarrassing"), Alcohol/Drug Susceptibility (e.g. "There is a good possibility that I develop drug or alcohol problems in the next 10 years"), Alcohol/Drug Severity (e.g. "Difficulties I would experience with drug or alcohol problems would last a long time"), Alcohol/Drug Benefits (e.g. "A burden would be lifted off me if I were to go get help for drug or alcohol problems"), and Alcohol/Drug Barriers (e.g. "Health professionals would not understand someone like me if I went to them for drug or alcohol problems"). Saleeby (2000) stated that further validation should be conducted, "including separate evaluations of the Emotional/Nervous subscales and the Alcohol/Drug subscales" (p. 93). However, the overall results from the factor analysis indicated that the different constructs are distinct enough from the others to be considered different beliefs (Saleeby, 2000).

Additional reliability and validity analyses. After establishing the distinctive nature of the constructs through factor analysis, Saleeby (2000) sought to establish additional reliability and validity of the HBMI. To test the internal consistency, Cronbach's alpha was calculated for the nine subscales of the HBMI. Saleeby (2000) indicated that alpha coefficients below .50 were considered poor reliability, .50 – .75 was moderately reliable, and above .75 indicated good reliability. The subscales generated alpha coefficients ranging from .76 to .96, except for Emotional/Nervous

Benefits ($\alpha = .67$), Alcohol/Drug Severity ($\alpha = .67$), and Alcohol/Drug Benefits ($\alpha = .64$). Alpha coefficients generated by race ranged from .65 to .95 for African-Americans and .50 to .97 for Caucasians. Test-retest reliability correlations were low on the subscales of Health Motivation, Emotional/Nervous Susceptibility, and Emotional/Nervous Benefits. Table 1 summarizes the internal reliability findings of Saleeby (2000).

Table 1**Internal Consistency* for the HBMI**

Subscale	Number of Items	African American (<i>n</i> = 37)	Caucasian (<i>n</i> = 86)	Total (<i>n</i> = 123)
Alcohol/Drug				
Susceptibility	5	.94	.95	.95
Severity	7	.79	.76	.72
Benefits	4	.70	.78	.75
Barriers	5	.72	.78	.76
Emotional/Nervous				
Susceptibility	5	.94	.96	.95
Severity	7	.79	.81	.80
Benefits	4	.68	.68	.69
Barriers	5	.77	.78	.78
Health Motivation	7	.81	.71	.75

*Cronbach's alpha statistic

Validity summary. The content validity of the instrument was initially determined by a panel of judges comprised of faculty and doctoral students familiar with both the subject matter of the HBMI and survey question writing (Saleeby, 2000).

The HBMI construct validity is supported by the factor analysis. Saleebey reported that factors with eigenvalues of 1.00 or greater were included in subsequent rotations. These rotations yielded 48 items on 7 factors with eigenvalues ranging from 1.91 to 10.10, accounting for 59.1% of the variance. One item was dropped due to a factor loading less than .40.

For the purposes of the current study, the overall HBMI will be modified in two specific ways. First, only the Alcohol/Drug scales will be used. Second, because the researcher is only interested in examining problematic drinking behavior, the word “drug” will be intentionally dropped from each of the Alcohol/Drug HBMI items. For example, item #1, which assesses Alcohol/Drug susceptibility is written as, “There is a good possibility that I develop drug or alcohol problems in the next 10 years.” In the current study, this question will be modified to read, ““There is a good possibility that I develop alcohol problems in the next 10 years.” All subsequent Alcohol/Drug items will be modified in the same fashion. Due to these modifications, preliminary validity (i.e., factor analysis) and reliability analyses will be conducted on the HBMI prior to the main analyses for the full study.

Data Analysis

Below is the overall analytic strategy I intend to implement to address each hypothesis. For ease of presentation, I restate the research questions below.

RQ1. What are the relationships among (a) social norms (quantity norms and frequency norms), (b) health belief components (susceptibility, severity, benefits, and barriers) and (c) problematic drinking among a sample of college students?

RQ1a: What is the relationship between social norms (quantity and frequency norms) and problematic drinking among a sample of college students??

RQ1b: What is the relationship between health belief components (susceptibility, severity, benefits, and barriers) and problematic drinking among a sample of college students?

Pearson product moment correlations will be used to determine correlations among social norms, health belief components, and problematic drinking among college students. Bivariate correlations between each of these constructs will be calculated and compared.

RQ2: Do social norms (quantity and frequency norms) and health belief components (susceptibility, severity, benefits, and barriers) predict a significant amount of variance in problematic drinking among a sample of college students?

A multiple regression analysis will be used to determine whether social norms and health belief components explain a significant amount of variance in problematic drinking among college students.

RQ3: Do social norms (quantity and frequency norms) and health belief components (susceptibility, severity, benefits, barriers) predict a significant amount of variance in

problematic drinking above and beyond selected socio-demographic variables known to be associated with college drinking among a sample of college students?

A multiple regression will be used to determine whether social norms and health beliefs explain variance in problematic drinking among college students above and beyond variance accounted for by socio-demographic variables known to be associated with college drinking. The socio-demographic variables included in this analysis include age, gender, ethnicity, Greek membership, athletic participation, and age at first drink. In the multiple regression analysis, two blocks of variables will be entered. The first block will consist of the socio-demographic variables. The second block will consist of the social norms and Health Belief constructs. The criterion or dependent variable will be problematic drinking as measured by the AUDIT.

RQ4: Do the components of the health beliefs model (susceptibility, severity, benefits, barriers) mediate the relationship between social norms (quantity norms and frequency norms) and problematic drinking among a sample of college students?

Research question 4 will be addressed using a Sobel Test for simple mediation. After establishing the relationship between quantity norms and problematic drinking and frequency norms and problematic drinking, each of the health belief model components will be entered to determine if either of the social norms drops from significance, indicating the relationship between social norms and problematic drinking is explained by the perceived susceptibility, perceived severity, perceived benefits, or perceived barriers constructs.

Potential Limitations

The current study has several potential limitations that could disrupt the external and internal validity of the results. Students sampled in the study will be chosen using convenience sampling based on their availability to the researcher. Efforts have been made to gain the most diversity in a convenience sample as possible, such as sampling from two university sites and targeting specific courses to recruit participants that are not concentrated in a single academic discipline. However, the results of the study may not be able to be generalized beyond the geographic region in which this study takes place. A key part of the study and data collection is self-report. Because the current study design utilizes self-report data, this could threaten internal validity if students choose to answer in a socially desirable manner to downplay their actual drinking or, conversely, if they choose to report that they drink more than they actually do.

It also is sometimes hard for students to conceptualize drinks in a standard format (i.e., one 12 ounce beer, one 5 ounce serving of wine, or a 1.5 ounce serving of hard liquor/spirits). For example, some error in reporting may occur due to lack of knowledge of how much actual alcohol was in a cup poured by a friend at a party. Also, students already in the beginning stages of alcohol dependence may employ use of defense mechanisms such as denial (“I never drink more than I intend to” or “I don’t drink nearly as much as my dad did”) or rationalization (“I had a killer week of midterms, I deserve to have a little fun on the weekend”). These will need to be taken into account

during the interpretation of any data collected using self-report measures, even though self-reporting is a generally accepted practice in research focusing on college student alcohol behaviors.

Students were informed of the confidential nature of the data collected for the study during recruitment, however it must be taken into consideration that the instruments were inquiring about illegal (underage drinking for participants not yet 21) and potentially embarrassing or shameful behaviors (failing to meet expectations due to drinking, being injured or injuring someone else due to drinking). There is the possibility that students answered in a socially desirable manner even though names were not attached to actual assessments, and only to the consent forms for the study. Taking all of these dynamics into consideration will be important when deciding on limitations for the current study and implications for future research.

Pilot Study

Purpose, Research Questions, and Hypotheses

A pilot study was conducted to test the feasibility of proposed procedures for the full dissertation study. The main focus of the pilot study was to gather information about the average length of time required to complete the assessment packet and to give pilot participants an opportunity to provide the researcher with any feedback about their experience completing the survey to correct problems before implementing the full study. A secondary focus was to provide descriptive statistics of pilot study

participants, correlations among the variables in the study, and the results of preliminary analyses based on the proposed research questions and hypotheses.

Instrumentation

Thirty participants were recruited to complete the study assessment packet which included the 8 items on the demographic form, 10 items on the AUDIT (Babor et al., 1992), 21 items on the HBMI (Saleebey, 2000), and the 10 items on the DNRF (Baer et al., 1991; 10 items), for a total of 49 items. Copies of the assessments can be found in Appendix C. The participants completed each part of the assessment packet in the order listed above. Cronbach's alpha coefficients were calculated for the total scores of the quantity norms and frequency norms of the DNRF, the four subscales of the HBMI, and the AUDIT. Each measure and subscale demonstrated acceptable levels of internal consistency, with all but one scale over .80. Perceived severity produced the lowest reliability value (.71), although still acceptable. Reliability estimates for all measures are listed in Table 2.

Table 2

Number of Items and Alpha Coefficients for the AUDIT, DNRF, and HBMI Measures

Measure	Number of Items	α Coefficient
AUDIT	10	.847
DNRF		
Quantity norms	8	.913
Frequency norms	8	.856

Table 2 (cont.)

Measure	Number of Items	α Coefficient
HBMI		
Susceptibility	5	.850
Severity	7	.719
Benefits	4	.836
Barriers	5	.824

Participants

Pilot study participants were recruited from convenience sample of students at one university selected for sampling in the full study. Current students enrolled in either a CED 210-Career and Life Planning course or CED 310-Helping Skills whose instructor gave the researcher permission to solicit students during class time during the week of March 26-30, 2012 were recruited to participate. Data were collected at the agreed upon time by the instructor and the researcher. Any full-time undergraduate student between the ages of 18 and 24 was eligible to be included. Part-time or adult (aged 25 or older) were excluded from participation. Table 3 provides a breakdown of the demographic characteristics of the pilot sample.

Procedures

Thirteen instructors at one university planned for inclusion in the full study were contacted by the researcher via email explaining the study and requesting class time to sample students. An example email can be found in Appendix B. The researcher was granted permission to collect pilot data in six classes. After four courses were surveyed,

the pilot requirements (i.e., sample number was reached) were met and the final two classes were not surveyed.

Table 3

Demographics of Pilot Study Participants

Demographic Characteristic	<i>n</i>	%
SEX		
Female	23	76.7
Male	7	23.3
Total	30	100.0
ETHNICITY		
Caucasian	21	70.0
African American	8	26.7
Asian	1	3.3
Total	30	100.0
AGE		
19	3	10.0
20	7	23.3
21	10	33.3
22	5	16.7
23	3	10.0
24	2	6.7
Total	30	100.0
CLASSIFICATION		
Freshman	1	3.4
Sophomore	5	17.2
Junior	13	44.8
Senior	10	34.5
Missing	1	3.4
Total	30	100.0

Table 3 (cont.)

Demographic Characteristic	<i>n</i>	%
GREEK		
Yes	4	13.3
No	26	86.7
Total	30	100.0
ATHLETE		
Yes	0	0.0
No	30	100.0
Total	30	100.0

The researcher presented the purpose of her research study and explained to potential participants what they would be asked to do if they agreed to complete the assessments. Informed consent forms to be signed and handed back were provided to all students agreeing to participate in the pilot study. Participants were asked to provide any feedback about confusing or awkward wording of questions or general comments about their experience completing the survey. In the first class, two students declined to participate. In the second and third class, all students agreed to complete the assessments. In the fourth class, two additional students declined participation. The overall response rate for the pilot study was 97%.

Analysis

Several analyses were used to assess the pilot study data. Pearson product moment correlations were used to address research question 1: What are the relationships among (a) social norms (quantity and frequency norms), (b) health belief

components (susceptibility, severity, benefits, and barriers) and (c) problematic drinking among a sample of college students? Multiple regression analyses were used to address research questions 2 and 3: Do social norms (quantity norms and frequency norms) and health belief components (susceptibility, severity, benefits, and barriers) predict a significant amount of variance in problematic drinking among a sample of college students? And, do social norms (quantity norms and frequency norms) and health belief components (susceptibility, severity, benefits, barriers) predict a significant amount of variance above and beyond selected socio-demographic variables known to be associated with problematic drinking among a sample of college students? Research 4 was not answered due to insufficient power with a sample size of only 30 participants.

Results

Research Question 1. The correlation matrix for the DNRF frequency, DNRF quantity, and AUDIT scores were calculated by averaging the responses on each of these scales. To address the first research question, Pearson product moment correlations were run on the social norms, health belief components, and problematic drinking variables. The results of the correlation matrix suggest the significant relationships exist between quantity norms and frequency norms and problematic drinking, which is indicated by moderate correlations between the AUDIT and DNRF scores. However, there is not adequate evidence from the pilot data to suggest a relationship between the health beliefs components and problematic drinking. The correlation matrix table (Table 3) is provided below detailing the results. Items marked with an asterisk (*) are

significant at the $p < .05$ level and those with a double-asterisk (**) are significant at the $p < .01$ level. Significant correlations are also highlighted for ease of presentation.

Research Question 2. The regression model was found to be significant at the .01 level, with an R-square of .49. The predictor variables of the frequency norms and quantity norms explain 49% of the variance in student drinking. As could have been expected from what the correlations showed, the health benefits are not significant predictors of student drinking. This finding is in contradiction with past research that has found benefits and barriers to be the two strongest predictors of health behavior from the health belief model (Carpenter, 2010). The small sample size employed for the pilot may not have yielded enough power to fully replicate the results of past research. With the health benefits in the model, frequency norms were also not found to be significant. To refine the model, predictors not found to be significant were removed in a stepwise manner. The resulting model had only two predictors, frequency norms and quantity norms.

The final model was found to be significant at the .01 level (p-value of .000), with an R-square of .42, with quantity norms explaining 42% of variance in problematic drinking. Therefore, the hypothesis for research question 2 is partially supported, with the quantity norms variable explaining a significant amount of the variance in problematic drinking among college students, but health belief components contributing negligible explanation to the model.

Table 4**Pilot Study Correlation Matrix**

		DNRF_freq	DNRF_quant	Audit	Susc	Severity	Benefit	Barrier
DNRF_freq	<i>r</i>	1.000	.587**	.427*	.011	.056	-.132	.008
	<i>p</i> -value		.001	.019	.953	.768	.486	.966
DNRF_quant	<i>r</i>	.587**	1.000	.646**	-.013	.100	-.044	-.049
	<i>p</i> -value	.001		.000	.945	.601	.816	.799
Audit	<i>r</i>	.427*	.646**	1.000	.182	.045	.056	.111
	<i>p</i> -value	.019	.000		.336	.813	.770	.561
Susc	<i>r</i>	.011	-.013	.182	1.000	.239	.178	.263
	<i>p</i> -value	.953	.945	.336		.203	.348	.161
Severity	<i>r</i>	.056	.100	.045	.239	1.000	.429*	.630**
	<i>p</i> -value	.768	.601	.813	.203		.018	.000
Benefit	<i>r</i>	-.132	-.044	.056	.178	.429*	1.000	.512**
	<i>p</i> -value	.486	.816	.770	.348	.018		.004
Barrier	<i>r</i>	.008	-.049	.111	.263	.630**	.512**	1.000
	<i>p</i> -value	.966	.799	.561	.161	.000	.004	

Research Question 3. The multiple regression analysis planned to address research question 3 for the full study was slightly modified for the pilot study. For the pilot, the college athlete variable was excluded because no pilot participants identified as NCAA athletes. Health belief components and frequency norms also were excluded as these were not shown to be significant in the previous analysis. The other selected socio-demographic variables (Greek life, gender, age at first drink, and ethnicity) were used to create the regression model.

This first block of variables, which included the socio-demographic items, produced a significant model at $p < .05$ level ($p = .04$). Socio-demographic predictors explained 35.3% of the variance in problematic drinking. Next, the quantity norms variable was added to the model, leading to an increase in explained variance from 35.3% to 45.2%. This shows a 10% increase when quantity norms are taken into account. However, the second model was not statistically significant, but approached significance with quantity norms having the largest standardized coefficient. There is an expectation that for the full study this variable could be statistically significant.

For research question three, the hypothesis that social norms and health beliefs constructs will explain variance in problematic drinking among college students above and beyond the variance explained by demographic variables known to be associated with risky drinking behavior among students was partially accepted. Specifically, social norms about the quantity of alcohol students expect their peers to be consuming provided an additional 10% of explained variance in drinking behavior. The contributions of the health belief constructs to the variance above and beyond demographic factors are still unclear.

Discussion and Implications for Full Study

The findings from the pilot study will inform considerations to be made for the larger dissertation study. On average, each of the participants in the pilot study took about 15 minutes to complete the assessment packet. Students who were abstainers had specific questions about how they should answer some questions on the AUDIT that

did not have a null or zero option. AUDIT question 2 asks “How many drinking containing alcohol do you have on a typical day when drinking?” The response options range from 1 to 10 or more. Abstainer students also sought guidance in how to answer HBMI questions about the benefits of getting help for drug or alcohol problems. For the full study, the researcher will take into account these concerns and incorporate specific statements during the oral presentation about how abstainers can conceptualize the items when completing the measures. For instance, “Even if you do not drink alcohol, it will be helpful to understand what you think in general about the seriousness of alcohol problems.” One pilot participant also was unclear about the binge drinking question on the demographic form. For the full study, the phrase ‘within a 2-hour period’ may be used in place of or in addition to the current wording ‘in a row.’ The 2-hour wording is more precise and reduces individual interpretation of what ‘in a row’ means and is in line with the NIAAA definition of binge drinking (NIAAA, 2012).

The HBMI items are designed to assess beliefs about drug or alcohol use. As noted above, the researcher intends to eliminate the use of the ‘drug’ term in each item of the HBMI so that the focus of the instrument is on beliefs about alcohol in particular. The researcher would need to complete a preliminary factor analysis and reliability analysis on the modified HBMI for the full study.

The relationship between social norms and problematic drinking was evident even with the small sample number employed in the pilot. This indicates the robust relationship between these two variables and corroborates the findings in previous

literature on social norms theory and drinking. The expectation for the full study is that this relationship will continue to be significant, providing a sound basis for performing the Sobel test to determine if the strength of the relationship between social norms and problematic drinking changes, or is reduced, if the health belief constructs do mediate the relationship as hypothesized.

Health belief constructs were not found to be significant predictors of drinking in the pilot study analysis. This may have been in part due to a smaller sample size.

Because the health belief constructs have not been studied nearly as thoroughly with the college student problematic drinker population as social norms theory, the evidence of this relationship may not have been as clear with such a small sample. It also may be appropriate to communicate to future participants that even if they are abstainers, their beliefs about their susceptibility, the severity, and the benefits and barriers to moderate drinking are still relevant. Some respondents may have given cursory answers to HBMI questions, assuming that the items only pertained to heavy drinkers or people with alcohol problems. On the contrary, some students who do not drink may have chosen not to consume alcohol specifically because of a known family history of alcohol abuse and decided to engage in preventative behavior as a result of this knowledge. For the full study, the researcher will expound on the benefits of health belief viewpoints from all participants to ensure that abstainers do not feel the survey items do not pertain to them. A larger sample size and a clearer explanation to all participants about the value

of their personal beliefs may add additional precision in understanding the role of health beliefs in student drinking behavior.

CHAPTER IV

RESULTS

In the first chapter of this manuscript, I delineated the scope and consequences of collegiate alcohol abuse and the purpose of the current study. A review of the literature on this topic was provided in chapter two. In the third chapter, I gave details on the methodology used in this research, with emphasis on research questions, hypotheses, and results from the pilot study used to determine the feasibility of procedures for the full study. This chapter presents detailed results of analyses conducted to test the hypotheses for this study. A description of the study sample is followed by descriptive statistics on the measures used for the study. Reliability statistics are provided for norm and sample populations. Finally, outcomes for each hypothesis are presented and a summary of the research findings is provided at the end of the chapter.

Description of Participants

Convenience sampling was used to obtain the participants in this study. A total of 303 survey packets were disseminated in academic classes where the researcher was given permission to recruit. Two non-academic entities also gave permission to recruit, the Wake Forest University band and athletic department. Out of 303 survey packets, 283 of were considered to be complete and entered into the dataset for analyses; hence

an overall study response rate of 93%. Two of the 20 surveys not deemed appropriate for entry into the dataset were from students outside of the specified age range for participants (18-24). The other 18 surveys that were not included in analyses were due to participants leaving significant portions of the survey blank. Students were sampled from three universities in the Piedmont Triad region of North Carolina. Of the 283 usable instruments collected, 116 (41%) were completed by students at Wake Forest University (WFU), 86 (30%) of respondents were from North Carolina Agricultural and Technical State University (NC A&T), and 81 (29%) were students from the University of North Carolina at Greensboro (UNCG).

Demographic information of the study sample was calculated. The average age of study participants was 20.5 years ($SD = 1.5$). More women (60.8%) than men completed the survey instruments. The sample yielded almost an equal number of African-American (43.8%) and Caucasian (45.6%) participants. Some students identified as being of Middle-Eastern, Persian, Native American, and multiracial descent. A small percentage of the total sample (10.6%) identified as members of social Greek organizations. Nearly a third (31.9%) of the students sampled were members of an NCAA athletic team, excluding club sports. Slightly under half (48.7%) of the sample was aged 20 or below; in other words, beneath the legal drinking age in the United States. The median age at first drink among participants was 16 years old, with more than a quarter (31.5%) of respondents reporting having had their first full alcoholic drink by the age of 15. The complete demographic information for the sample is provided in Table 5.

Table 5**Demographics of Study Participants**

Demographic Characteristic	<i>n</i>	%
GENDER		
Female	172	60.8
Male	111	39.2
Total	283	100.0
GREEK AFFILIATION		
Greek	30	10.6
Non-Greek	252	89.0
Missing	1	0.4
Total	283	100.0
ETHNICITY		
Other	13	4.6
Pacific Islander	1	0.4
Hispanic/Latino/a	5	1.8
Asian American	11	3.9
African American/Black	124	43.8
Caucasian/White	129	45.6
Total	283	100.0
ATHLETICS		
Athlete	90	31.8
Non-Athlete	192	67.8
Missing	1	0.4
Total	283	100.0
AGE AT FIRST DRINK		
Abstainer/Never had full drink	16	5.7
11 or younger	4	1.4
12	16	5.7
13	7	2.5
14	26	9.2
15	36	12.7
16	44	15.5

Table 5 (cont.)

Demographic Characteristic	<i>n</i>	%
AGE AT FIRST DRINK (cont.)		
17	39	13.8
18 or older	95	33.6
Total	283	100.0
AGE		
18	32	11.3
19	39	13.8
20	64	22.6
21	77	27.2
22	39	13.8
23	17	6.0
24	9	3.2
Missing	6	2.1
Total	283	100.0
CLASSIFICATION		
Freshman	31	11.0
Sophomore	41	14.5
Junior	74	26.1
Senior	134	47.3
Post-Baccalaureate	1	0.4
Missing	2	0.7
Total	283	100.0

Additional demographic information specific to comorbidity and additional risk factors for problematic drinking were collected from participants as well. Two out of three respondents (66.1%) answered in the affirmative to the survey item inquiring about knowledge of a family history of alcohol abuse. The vast majority of students (97.9%) denied having ever been hospitalized or in an intensive outpatient program (IOP)

for an alcohol related issue. However, students did report other instances of having been in trouble for an incident relating to their alcohol use, including underage drinking tickets (7.1%), DUI/DWI charges (1.4%), and judicial referrals through their university (0.7%). Some students selected “other” to the item inquiring about specific kinds of trouble students found themselves in after consuming alcohol. These responses ranged from being in trouble with parents (0.7%) to escorting a friend who was incapacitated or unresponsive due to alcohol use to the hospital (0.4%). Overall, about 12% of the sample indicated having been in trouble for alcohol related issues once or twice. Most respondents (82.7%) did not endorse diagnosis of a mental health concern. Some students reported diagnoses of anxiety disorders (2.5%) and depressive disorders (1.4%), with an additional 2.1% reporting both anxiety and depression. The most common comorbid disorder reported among the sample was attention deficit/hyperactivity disorder (ADD or ADHD) at a rate of 7.4%. One respondent indicated ‘other’ in response to the mental health conditions item and indicated having a diagnosis of paranoid schizophrenia. About one percent (1.1%) of respondents indicated having three or more mental health diagnoses. Less than one percent of the sample reported diagnosed eating disorders (0.7%) and bipolar disorder (0.4%). Table 6 summarizes respondents’ indications of trouble due to alcohol use, mental health diagnoses, and family history demographic information.

Table 6**Mental Health and Family History Demographic Information**

Demographic Characteristic	<i>n</i>	%
FAMILY HISTORY ALCOHOL ABUSE		
Yes	187	66.1
No	96	33.9
Total	283	100.0
HOSPITAL OR IOP		
Yes	6	2.1
No	277	97.9
Total	283	100.0
TROUBLE DUE TO ALCOHOL USE		
Never	249	88.0
Once or twice	34	12.0
Total	283	100.0
TYPE OF TROUBLE		
None	249	88.0
Judicial referral	2	0.7
Underage drinking ticket	20	7.1
DUI/DWI	4	1.4
Open Container Violation	2	0.7
Trouble with parents	2	0.7
Other	2	0.7
Missing	2	0.7
Total	283	100.0
MENTAL HEALTH DIAGNOSIS		
None	234	82.7
Anxiety Disorder	7	2.5
Depressive Disorder	4	1.4
Bipolar Disorder	1	0.4
Eating Disorder	2	0.7
ADHD/ADD	21	7.4
Other	1	0.4

Table 6 (cont.)

Demographic Characteristic	<i>n</i>	%
MENTAL HEALTH DIAGNOSIS (cont.)		
Anxiety and Depression	6	2.1
ED and Depression	1	0.4
ADHD and Depression	1	0.4
ADHD and Anxiety	2	0.7
3 or more diagnoses	3	1.1
Total	283	100.0

Descriptive Statistics of Instruments Used in the Study

Three measures (excluding the demographic form) were used in this study, the Alcohol Use Disorders Identification Test (AUDIT; Babor et al., 2001), Drinking Norms Rating Form (DNRF; Baer et al., 1991), and the Health Belief for Mental Illness (HBMI; Saleeb, 2000) survey. In Table 7, I provide means and standard deviation scores for the three instruments used in the present study. For the AUDIT, the mean score was 5.90 ($SD = 5.20$). Scores ranged from a total of zero for abstainers up to 29. AUDIT scores of 8 or higher indicate hazardous, harmful, or problematic alcohol use. Scores above 20 indicate alcohol dependence (Babor et al., 2001). The highest score possible on the AUDIT is a 40. For the AUDIT, individual item means and standard deviations are provided since the instrument provides one total score.

Neither the Drinking Norms Rating Form (DNRF) nor the Health Beliefs for Mental Illness (HBMI) survey produce total scores. For the DNRF, Quantity and Frequency subscale scores are listed below. For the DNRF Frequency scale, the mean

was 28.47 ($SD = 6.33$). The DNR Quantity scale mean was 30.40 ($SD = 5.80$). Scores were calculated by averaging respondents' answers on each scale. For the HBMI, Susceptibility, Severity, Benefits, and Barriers scale scores were calculated. The mean Susceptibility score for the sample was 7.03 ($SD = 3.12$). The average Severity score was 19.86 ($SD = 5.68$). The mean Benefit score was 10.66 ($SD = 4.62$). On average, Barrier scores were around 10.29 ($SD = 4.01$).

Table 7**Descriptive Statistics for Participant Scores on AUDIT, DNR, and HBMI**

Instruments, Items (AUDIT only), and subscales	Sample		Possible Range	Observed Range
	<i>M</i>	<i>SD</i>		
AUDIT (Total)	5.90	5.21	0.0 – 40.0	0.0 – 29.0
Frequency	1.65	0.97	0.0 – 4.0	0.0 – 4.0
Quantity	0.92	1.02	0.0 – 4.0	0.0 – 4.0
Binge Drinking	0.89	0.96	0.0 – 4.0	0.0 – 4.0
Loss of Control	0.25	0.61	0.0 – 4.0	0.0 – 4.0
Failed Expectation	0.35	0.65	0.0 – 4.0	0.0 – 4.0
Morning Drink	0.09	0.35	0.0 – 4.0	0.0 – 2.0
Guilt/Remorse	0.44	0.70	0.0 – 4.0	0.0 – 4.0
Blackout	0.52	0.77	0.0 – 4.0	0.0 – 4.0
Injury	0.55	1.24	0.0 – 4.0	0.0 – 4.0
Cut Down	0.27	0.91	0.0 – 4.0	0.0 – 4.0
DNR				
Frequency	30.40	5.80	1.0 – 7.0	1.0 – 5.87
Quantity	28.47	6.33	1.0 – 6.0	1.0 – 5.87
HBMI				
Susceptibility	7.03	3.12	5.0 – 25.0	5.0 – 25.0
Severity	19.86	5.68	7.0 – 35.0	7.0 – 33.0

Table 7 (cont.)

Instruments, Items (AUDIT only), and subscales	Sample		Possible Range	Observed Range
	<i>M</i>	<i>SD</i>		
HMBI (cont.)				
Benefit	10.66	4.62	4.0 – 20.0	4.0 – 20.0
Barrier	10.29	4.01	5.0 – 25.0	5.0 – 21.0

Reliability Statistics for Instruments Used in the Study

Reliability findings with alpha coefficients for this sample and reliability coefficients from norm samples are reported in Table 8 for the three instruments employed in the current study. The Cronbach's alpha coefficient in the current study for the AUDIT was 0.81. DNRF Frequency alpha coefficient was 0.78, and Quantity alpha was 0.82. The internal consistency for the HMBI Alcohol-Drug subscales ranged from 0.75 to 0.86. Perceived susceptibility yielded the highest reliability, which is consistent with the norm group reliability data.

Table 8

Internal Reliability* Coefficients for Study Instruments

Instrument	# of Items	Norm Alpha	Study Alpha
AUDIT (Total)	10	.86	.81
DNRF	16	.80	.86
Quantity	8	.80	.82
Frequency	8	.80	.78

Table 8 (cont.)

Instrument	# of Items	Norm Alpha	Study Alpha
HBMI	21	--	.86
Susceptibility	5	.95	.86
Severity	7	.72	.75
Benefits	4	.75	.82
Barriers	5	.76	.76

* Cronbach's Alpha coefficient

Results of Hypothesis Testing

This section outlines the results from the hypothesis tests that were run for this study. The analyses used to test the hypotheses for this research include Pearson product moment correlations, multiple regressions, and a Sobel Test for Mediation.

Hypothesis 1

Hypothesis 1a stated that there will be a significant, positive correlation between social norms and problematic drinking among a sample of college students. Pearson product moment correlations indicated that a significant positive correlation does in fact exist between Frequency norms and problematic drinking as measured by the AUDIT ($r = .128, p < .05$). There was also a statistically significant positive correlation between Quantity norms and problematic drinking ($r = .300, p < .01$).

Hypothesis 1b was listed in four parts. The researcher hypothesized a significant negative relationship between (a) perceived susceptibility and problematic drinking, (b) perceived severity and problematic drinking, and (c) perceived benefits and problematic

drinking. Finally, a significant positive relationship between (d) perceived barriers and problematic drinking was expected. The negative relationship between perceived susceptibility and problematic drinking was not supported. The relationship was positive, and deemed to have both statistical and practical significance ($r = .539, p < .01$). The hypothesized significant relationship between perceived severity and problematic drinking also was not supported. The negative relationship between perceived benefits and problematic drinking was supported ($r = -.175, p < .01$), as well as the positive relationship between perceived barriers and problematic drinking ($r = .226, p < .01$). The complete correlation matrix is presented in Table 9.

Table 9

Pearson Correlation Matrix for AUDIT, DNRf and HBMI Subscales

		AUDIT	Freq. Norm	Quant. Norm	Susceptibility	Severity	Benefit	Barrier
AUDIT	<i>r</i>	1	.123*	.300**	.539**	-.003	-.175**	.226**
	<i>p</i> -value		.045	.000	.000	.966	.004	.000
Frequency Norms	<i>r</i>		1	.543**	.115	-.011	-.076	-.001
	<i>p</i> -value			.000	.060	.857	.213	.986
Quantity Norms	<i>r</i>			1	.144*	-.025	-.063	.089
	<i>p</i> -value				.018	.684	.305	.144
Susceptibility	<i>r</i>				1	.211**	.091	.437**
	<i>p</i> -value					.000	.131	.000
Severity	<i>r</i>					1	.606**	.421**
	<i>p</i> -value						.000	.000
Benefit	<i>r</i>						1	.347**
	<i>p</i> -value							.000
Barrier	<i>r</i>							1
	<i>p</i> -value							

Note: * $p < .05$ (2-tailed); ** $p < .01$ (2-tailed)

Hypothesis 2

Hypothesis 2 stated that both social norms and health beliefs components would account for a significant portion of the variance in problematic drinking among college students. Specifically, the researcher expected both theoretical constructs to contribute significantly to the regression model. For the full regression model all variables were entered (frequency norms, quantity norms, susceptibility, severity, benefits, and barriers) yielding an R-square of .410. In other words, 41% of variance in college student problematic drinking could be explained using this model. While the full model was statistically significant, three of the predictors were not. A backward elimination was used to remove non-significant predictors. When non-significant predictors were removed the model remained significant. Quantity norms, perceived susceptibility, and perceived benefit were left in the regression model after they were each found to be significant. The table below provides information about the significant predictors of the model.

Table 10

Regression Model Significant Predictors

	Standardized			Overall Model Statistics		
	Beta	<i>t</i> -value	<i>p</i> -value	<i>R</i>	<i>R</i> Square	<i>F</i>
DRNF Quantity	.295	5.02	.000	.640	.410	28.80*
Susceptibility	.522	9.56	.000			
Benefit	-2.43	-3.91	.000			

**p*-value = .000

Hypothesis 3

The results from hypothesis two served as the foundation for hypothesis three. Hypothesis 3 stated that social norms and health belief model variables would contribute a significant amount of variance in problematic student drinking above and beyond the selected socio-demographic variables known to be associated with heavier and more risky drinking among students. These socio-demographic variables include ethnicity, gender, membership in a social Greek life organization, membership in an NCAA athletic team, and the age at which a person had their first full drink of alcohol. To analyze this hypothesis, ethnicity was split into a dichotomous variable (White and non-White) based on literature support for White students being the highest risk racial group with regard to heavy and hazardous drinking patterns.

In the first regression model, the five socio-demographic variables (ethnicity, gender, Greek membership, athlete, and age at first drink) were added. Eight percent (8%) of the variance in drinking behavior was accounted for by these variables alone. In the second regression model, the three significant variables from the previous research question (perceived susceptibility, quantity norms, and perceived benefits) were added to determine if the hypothesized increase in variance would be found. The second regression model explained 35.7% of the variance in student drinking behavior, much more than the initial model that only included demographic variables. The first model was statistically significant, but only explained less than 10% of the variance in student drinking where the combination of social norms and health beliefs explained

substantially more. The socio-demographic variables actually dropped out as significant variables once the social norms and health beliefs variables are entered into the model.

Table 11

Regression Model—Sociodemographic Variables vs. Social Norms and Health Beliefs Variables

				Overall Model Statistics		
Model One	Standardized Beta	<i>t</i> -value	<i>p</i> -value	<i>R</i>	<i>R</i> Square	<i>F</i>
Gender	.142	2.33	.020			
Ethnicity	.128	2.04	.042			
Greek	.028	.461	.645			
Athlete	.185	2.91	.004			
Age at 1 st drink	.048	.787	.432	.289	.083	4.56 ¹
				Overall Model Statistics		
Model Two	Standardized Beta	<i>t</i> -value	<i>p</i> -value	<i>R</i>	<i>R</i> Square	<i>F</i>
DNRF Quantity	.227	4.65	.000			
Susceptibility	.529	10.85	.000			
Benefit	-.213	-4.39	.000	.664	.441	24.40 ²

¹*p*-value = .001, ²*p*-value = .000

Hypothesis 4

The final hypothesis in this research study posits that a student's health beliefs (perceived susceptibility, severity, benefits, and barriers) will each mediate the relationship between quantity norms and problematic drinking and frequency norms and problematic drinking. Figure 2 offers a visual representation of the hypothesized relationships outlined in Hypothesis 4. Line C represents the already established

relationship between social norms as an independent variable (IV) and problematic drinking as the dependent variable (DV). Lines A and B represent the path to determine whether any or all of the health beliefs variables mediate this relationship and contribute additional variance in the equation of college student drinking. Table 12 provides results from the Sobel test.

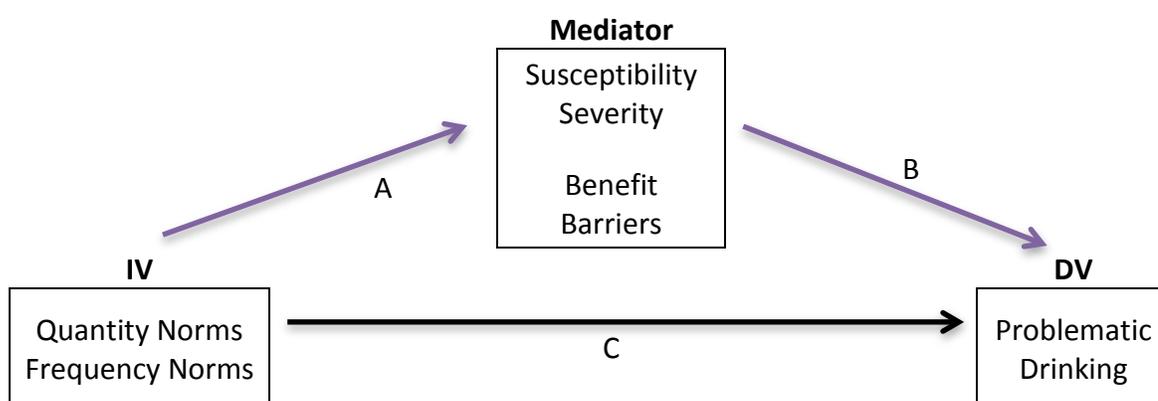


Figure 2. Sobel Test—Hypothesized Mediation Relationship

Table 12

Sobel Test Results

IV	Mediator	DV	Ta	Tb	Sobel test statistic	p-value
Quantity Norms	Susceptibility	AUDIT	2.382	10.579	2.323	.02
Quantity Norms	Severity	AUDIT	-0.407	-0.043	.042	.96
Quantity Norms	Benefit	AUDIT	-1.028	-2.923	.970	.33
Quantity Norms	Barriers	AUDIT	1.464	3.835	1.368	.171
Frequency Norms	Susceptibility	AUDIT	1.892	10.579	1.862	.063
Frequency Norms	Severity	AUDIT	-.181	-.043	0.042	.967
Frequency Norms	Benefit	AUDIT	-1.249	-2.923	1.149	.251
Frequency Norms	Barriers	AUDIT	-.017	3.835	0.017	.986

In Table 12, the 'Ta' and 'Tb' are the *t*-values of the coefficients in each model. In order to run the Sobel test, a regression model of each mediator predicting the DV, and of each IV predicting the mediator was run. Then, the coefficients and standard error (or *t*-values) were used to calculate the Sobel test statistics. The susceptibility factor is a significant mediator when quantity norms are used to predict AUDIT scores. Hypothesis 4 is partially supported, in that one of the four health belief model variables mediated the relationship between social norms and problematic drinking. Severity, benefits, nor barriers were found to significantly mediate the relationship between social norms and drinking behavior.

Summary of Results

The main objective of this chapter was to report the results related to the research questions and hypotheses included in the present research study. The first hypothesis (and sub-hypotheses) stated that there would be relationships between problematic drinking and perceived susceptibility (negative correlation), perceived benefits (negative correlation), and perceived barriers (positive correlation). All of these hypotheses were supported. Only the expected relationship between problematic drinking and perceived severity (negative correlation) was not supported.

In Hypothesis 2, the researcher proposed that social norms and health beliefs would account for a significant amount of variance in the drinking behaviors among college students. The data provide partial support for this hypothesis in that two health beliefs components (perceived susceptibility and perceived benefits) and one social

norms component (quantity norms) were significant predictors to the regression model. Neither perceived barriers, perceived severity, nor frequency norms were found to be statistically significant predictors for the regression model.

The third hypothesis stated that social norms and health beliefs would add additional variance to explain hazardous drinking among college student above and beyond socio-demographic variables already known to be factors in risky drinking behaviors. This theory was supported in full with socio-demographic factors only accounting for 8% of the variance in drinking whereas social norms and health beliefs variables accounted for 39% of the variance above demographics; as the socio-demographic variables began to drop out of significance when compared to the social norms and health belief model components in the regression model.

The final hypothesis posited that health belief model components might mediate the already established relationship between social norms and problematic drinking. It was found that one component of the health belief model, perceived susceptibility, was a significant mediator between social norms and problematic drinking. The results of the data analysis from this chapter will be discussed in the next chapter, along with an integrated interpretation of research findings, potential limitations of the current research, areas for future study, and implications for counselors.

CHAPTER V

DISCUSSION AND IMPLICATIONS

The results of the hypothesis testing for the four guiding hypotheses in this study were presented in Chapter IV. Chapter V provides the reader with a more detailed discussion of study findings, including a brief recap of study participants, instrumentation and its feasibility for continued use with the college population, and in-depth discussion of research findings for each hypothesis. Next, major findings are discussed with specific sections for each of the three main variables in the study: problematic drinking, social norms, and health beliefs. These findings are then compared and contrasted with recent research. Limitations for this study are discussed including a discussion on practical versus statistical significance of findings. Practical implications from findings as they relate to counseling practice and counselor education are presented, ending with steps for future research.

Participants

The study consisted of 283 total participants currently enrolled in college at either the University of North Carolina at Greensboro (UNCG), North Carolina Agricultural and Technical State University (NC A&T), or Wake Forest University (WFU). Twenty of the survey instruments were incomplete and not entered into the dataset. Participation in this research study was voluntary and confidential, so no names or

identifying information was gathered for the purpose of data analysis. Due to insufficient data, it was not feasible to determine differences in the students who chose not to complete their instruments and those who did.

Over half of the sample consisted of female participants (60.8% women versus 39.2% men). The most prevalent racial group in the study was African-American students, making up 45.6% of the sample. Inclusion of NC A & T, a historically Black college/university, in the data collection sampling may have contributed to the high number of African-American students completing the study instruments. The sample was demographically diverse with proportional representation similar to what is found on college campuses nationally, with gender in particular equivalent to reports of college student populations (National Center for Education Statistics, 2012). African Americans were overrepresented compared to their occurrence in college populations nationally. This oversampling was intentional in order to assure adequate sample sizes for analyses. However, because the sample is not representative caution is necessary in interpreting and generalizing the findings beyond these institutions in NC.

Participant's ages ranged from 18 to 24, with a little less than half (48.7%) of students being aged 18-20 (underage) when they completed the assessments. The majority of participants were non-Greek, making it harder to compare Greek versus non-Greek rates of drinking as done in previous research. The majority of the sample were seniors (47.7%), possibly due to the timing of data collection over the summer session months (July-August). This timing may have yielded a higher number of seniors

finishing courses for graduation. About 5.7% of the participants were abstainers from alcohol based on their zero AUDIT scores and answer to item inquiring about age at first drink, of which Never/Abstainer was an option. This percentage of abstainers in the current sample is smaller than the percentage of abstainers found in previous research. Knight et al. (2002) found that 19% of their sample of over 14,000 students from 119 colleges and universities were abstainers. In the College Alcohol Study (CAS) 16% of students reported having abstained from alcohol for the past year (Wechsler et al., 2002). The researchers noted an overall increase in students identifying as abstainers from one period to the next. The CAS was conducted in 1993, 1997, 1999, and 2001; with a follow up study for the heaviest drinking campuses in 2005. In 1997, researchers noted for the first time that the number of student identifying as abstainers had increased (Wechsler et al., 2002).

One notable characteristic among the study sample was the high number of students (66.1%) reporting a family history of alcohol abuse. This is an important factor based on the Health Belief Model literature construct of susceptibility, especially if respondents indeed are aware that a family history of alcohol abuse is an individual risk factor for risky behaviors around alcohol (Wechsler & Wuethrich, 2002).

The lower number of abstainers and higher number of African-American participants may be a function of the non-random, convenience sampling method used in the current study. It is possible that students in this region or simply at the particular institutions sampled drink more heavily than the national average. For example, Wake

Forest University had each incoming student in the 2012 freshmen class complete My Student Body, an evidence-based online prevention course. The program allows institutions to compare their students with national trends in alcohol use. The Wake Forest Substance Abuse Prevention Coordinator stated that Wake students reported drinking rates higher than the national average (L. Wilson, personal communication, August 24, 2012). My Student Body data shows that nationally, 20% of students are high risk drinkers whereas the WFU population had a 28% rate of high risk drinkers. This could be one explanation for the lower than average number of students who described themselves as abstainers in the current study sample. It will be important for future researchers to determine whether institutions in specific regions of the country are more prone to heavier drinking and lower rates of students who choose to abstain from alcohol use.

Instruments

The three instruments used in this study were the AUDIT, HBMI, and DNRF. The AUDIT demonstrated strong internal consistency ($\alpha = .811$) for use with the current sample. This is in line with previous research demonstrating the AUDIT's high reliability with a college student population (Babor et al., 1992).

Strong reliability scores for the HBMI also were found with the current sample. This finding is especially relevant as it replicates the strong reliability scores found in the study norming the HBMI on "employees and students in a bachelor's degree completion program at a large health care institution and affiliated college of nursing" (Saleeby,

2000, p. 85). Reliability scores for each scale ranged from .754 to .863 with the sample population for this study, where Saleeby (2000) found alpha scores ranging from .76 to .96. This provides researchers with a rationale for continuing to use the HBMI to assess health beliefs among college students. These strong reliability scores were found even after slight adjustments to the instrument to make it the most relevant for a college sample. For the current study, two expert reviewers were asked to review the HBMI items and make suggestions so that the readability and relevance to a college student population could be maximized. The first expert reviewer was a 3rd year doctoral student in the researcher's graduate program with experience working with and researching college student substance abuse. The second expert was a faculty member in the Public Health Education department at the University of North Carolina at Greensboro familiar with the health beliefs model.

Strong reliability scores for the DNRF also were evident with the current sample of collegians. The DNRF Frequency scale yielded a Cronbach's alpha of .788 and the DNRF Quantity scale alpha was .825. The DNRF also was normed on and designed for use with the college population, therefore the expectation of strong reliability scores for the instrument and study population was expected.

In essence, reliability scores for each instrument used in the current study were strong and in line with the literature on norming for each assessment. The HBMI reliability scores were of particular note because of the three instruments, the HBMI had been the least studied and researched, especially with a student population.

Findings of the current study suggest its inclusion as a viable assessment of health beliefs among college students.

Discussion of Hypotheses

Hypothesis 1

Hypothesis one was divided into two sub-hypotheses, 1a and 1b. Both are restated below followed by discussion.

Hypothesis 1a. Several relationships between study variables were tested in the first hypothesis. The researcher hypothesized that there will be a significant, positive relationship between social norms and problematic drinking. This hypothesis was supported by the data. The positive correlation between quantitative social norms and problematic drinking was both practically significant and statistically significant at the $p < .01$ level. Frequency social norms were also statistically significant at the $p < .05$ level. However, with a large sample size and a Pearson's r value of only .123, practical significance of frequency social norms in relation to problematic drinking is questionable. This may be explained by the differing effects quantity norms versus frequency norms have on problematic drinking. In other words, how much students believe their peers are drinking (quantity) has a more profound effect on drinking behavior than beliefs about how often other students drink (frequency). This may be because student drinking often has a competitive nature (Grossbard, Geisner, Neighbors, Kilmer, & Larimer, 2007), with drinking games that often consist of who drinks the most. A student may drink large amounts (quantity) of alcohol, but do so infrequently

(frequency) which could still lead to the negative consequences outlined in earlier chapters including unwanted sexual experiences, hangovers, blackouts, or vomiting. Thus, students may pay more attention to quantity of use of their peers, and this may contribute to the perception that impacts their own quantity of drinking. This finding is in line with previous research using the social norms paradigm with college students (Beck & Treiman, 1996; Korcuska & Thombs, 2003; Page et al., 1999; Perkins, 1985, 1987; Perkins & Wechsler, 1996; Thombs, Wolcott, & Farkash, 1997).

Hypothesis 1b. For the second hypothesis, the researcher predicted that health beliefs model constructs would be significantly correlated with problematic drinking among students. Specifically, the researcher postulated that if a students' perceived susceptibility to problematic drinking was high, they would be less likely to engage in risky drinking behavior. If students believed that alcohol use disorders were severe, this would also decrease likelihood of excessive alcohol use. If students saw benefit in moderate drinking, they would be less likely to over consume alcoholic beverages in general. Finally, if students saw several barriers to moderate drinking they would be more likely to drink excessively.

The hypothesized negative relationship between a student's perceived susceptibility and his problematic drinking was not supported. The relationship was actually positive. One explanation for a positive relationship between susceptibility and problematic drinking is that once students enter college and begin to drink heavily, their susceptibility increases as they experience negative consequences as a result of

excessive alcohol use. Instead of the theoretical relationship that a belief of susceptibility occurs first and thus influences more moderate alcohol use, the opposite effect of heavier use leading to a belief in increased susceptibility might have occurred. This is perhaps because students are not routinely asked about how they feel about their personal susceptibility to an alcohol use disorder. Once they enter college and become more aware of their susceptibility, their drinking is already at a higher rate. It is also possible that students with lower perceived susceptibility scores also drank less. As perceived susceptibility scores went down problematic drinking scores also went down, resulting in a positive correlation. Students may have perceived their susceptibility to an alcohol use disorder to be slight given that their drinking behaviors tend to be more moderate rather than problematic.

The expected negative relationship between perceived severity and problematic drinking was also not supported. The relationship did go in the hypothesized direction in that it was a negative correlation, but was not significant. This indicates that in the current sample of students, drinking behavior is not significantly affected by a student's perception of alcohol abuse as a serious condition. Possibly students believed that an alcohol use disorder was serious, but that it would not affect them and therefore there was no need to modify their drinking behaviors. Conversely, students may have just not seen alcohol abuse or dependence as a serious enough condition. Student scores on the HBMI severity subscale indicated that in this sample, students moderately agreed with the concept of severity. In other words, student responses imply a moderate level of

belief that alcohol abuse is a serious condition. The fact was that this belief did not impact their negative drinking behaviors, possibly because of a tendency for older adolescents to harbor feelings of invincibility as if they are immune from certain diseases or conditions (Nygaard, Waiters, Grube, & Keefe, 2003).

Hypothesis 2

For hypothesis two the researcher conjectured that both social norms and health beliefs components would account for significant amounts of variance in problematic drinking among college students. It was predicted that both would substantially contribute to a regression model. With each of the study's main variables entered, the regression model was significant and explained 41% of the variance in problematic drinking among students. The three most significant predictors of the model were susceptibility, quantity norms, and perceived benefits. Overall, part of the health beliefs model (susceptibility and benefits) and part of the social norms paradigm (quantity norms) are important variables in college student drinking behavior. This finding highlights the importance of including health beliefs variables in future studies related to college student drinking. Whereas social norms has long been known to provide relevant information on variability in student drinking, health beliefs also have a significant contribution to understanding this issue. Students who could see the benefits of moderate drinking were likely to subscribe to beliefs and engage in behaviors that supported reasonable alcohol use. As such, these students were more likely to engage in less problematic drinking.

Non-significant predictors were barriers, frequency norms, and perceived severity. Barriers may have come up as non-significant because of the types of barriers that were assessed on the HBMI. Barrier items included statements such as “My peers or family would think differently about me/would not understand me if I were to get help for alcohol problems” or “Getting help for an alcohol problem would cost too much money/take too much time.” It is possible that the types of barriers assessed are not as salient to college students as the barriers related to how they believe their peers will treat them socially based on their level of drinking. Frequency norms may have dropped out of significance in the regression model because of their less obvious effects on problematic drinking when compared to quantity norms, as discussed above. Perceived severity seems to be non-significant in the model due to respondent’s dismissal of the severity of an alcohol abuse condition with regards to their drinking behaviors. Although students may believe the condition to be serious, their belief that the chances of them personally having to deal with an alcohol diagnosis is so slim that it does not impact behaviors.

Hypothesis 3

The third hypothesis predicted that social norms and health beliefs variables would account for a larger portion of the variance in problematic drinking among students than socio-demographic variables such as ethnicity, gender, student athlete status, age at first drink, or membership in a Greek life organization. This was indeed found to be the case; demographic variables accounted for 8% and social norms and

health beliefs variables accounting for 35.7% of the variance. This finding indicates that the pull students feel to drink based on how their peers are drinking, coupled with personal health beliefs about susceptibility, severity, benefits, and barriers related to alcohol consumption far outweigh the demographic attributes often associated with problematic drinking. When only the health beliefs variables are left in the regression, 28.6% of variance is still explained. This indicates that health beliefs alone contribute the largest portion of the variance in problematic drinking; more so than demographic or social norms variables. Again, this highlights the importance of continuing to explore the depth and breadth of how health beliefs might be important resources to tap into when designing alcohol and drug abuse prevention programs targeted at college student populations.

Hypothesis 4

The final hypothesis stated that a student's health beliefs would mediate the already existing relationship between social norms and problematic drinking. Of the four health beliefs constructs, only susceptibility was found to significantly mediate the relationship between quantity norms and problematic drinking. The susceptibility factor has been consistently found to be significant above the other factors in this study. The fact that susceptibility was found to be a significant mediator indicates that the relationship between quantity norms and problematic drinking can be explained by susceptibility. It may be that quantity norms effect perceived susceptibility, which then

influences problematic drinking. Thus, susceptibility helps explain why quantity norms and problematic drinking are related.

The fact that severity, benefits, or barriers constructs were not found to significantly mediate the relationship between quantity norms and problematic drinking may have been a result of the type of benefits, barrier, and severity questions posed by the HBMI assessment. Questions focused more on the life stage and developmental level of college respondents may yield different results for future research. Rewording the instrument's constructs to include social and academic barriers and benefits more relevant to college students may be warranted. It is possible that based on college student developmental level and stage of life, barriers items should focus on getting at specific areas that college student alcohol use research already state as barriers to moderate drinking, such as lowered inhibitions and feeling more attractive/sexy (Cashin et al., 1998) or feeling that excessive use is an integral part of the college experience that they would be missing out on (Crawford & Novak, 2006).

Summary of Major Findings

Problematic Drinking

Problematic drinking was defined as the point at which alcohol use has become hazardous to one's health for the purpose of this study. This construct was measured using the AUDIT scoring thresholds of 8 or above for alcohol abuse and 20 and above for alcohol dependence. Below, I provide information about how respondents answered each assessment, breaking results down by demographic characteristics.

AUDIT scores. For men, the average AUDIT score was 7, with the most commonly occurring score being 5. The maximum score for men was 29 where the maximum score for women was 23. Among male participants, 36.9 % scored above an 8 on the AUDIT with 23.8% of women scoring above an 8. Mean scores for women were 5, with the most commonly occurring score being one.

White students were more prone to problematic drinking in the current sample than students of minority racial groups. This study replicated results from previous research findings where White students typically were more likely to be problematic drinkers (Ham & Hope, 2003). Of White students, 35.7% scored above an 8 on the AUDIT, whereas 23.7% of non-White students met the AUDIT threshold for problematic drinking. Overall, five men and one woman scored above a 20, indicating alcohol dependence.

Quantity and frequency. Thirty-six percent of women and 38.7% of men reported drinking 2-4 times per month. Although there was once a significant divide between the way men and women drank, the current findings mirror a growing trend in collegiate alcohol abuse research findings of women beginning to catch up with men in terms of the frequency and quantity of alcohol use (Korcuska & Thombs, 2003). This is especially relevant given the current study findings of only 8% of variance explained by socio-demographic variables, and 44% explained by social norms and health beliefs variables.

Social Norms

Frequency norms. Frequency norms were non-significant in the regression model predicting problematic alcohol use. Students often estimated their peers' frequency of use as higher than their own. This is also in line with previous social norms research on student perceptions of peer use (Berkowitz, 2004).

Quantity norms. Quantity norms were found to be significant in the regression model for reasons delineated above. Most students held perceptions that their peers drank more heavily than they themselves or their closest friends did. Although some social norms campaigns have tried to capitalize on this by exposing students to media messages about the more moderate drinking that most students engage in, drinking in moderation was easily dismissed by heavier drinking students whose experiences did not tally with the messages. The current research offers the additional insight that while quantity norms are part of the puzzle in student drinking behavior, they are mediated by the health beliefs that a student holds, specifically perceived susceptibility. New social norms campaigns can begin to take this into consideration by gathering data about student beliefs and attitude and including those for potentially more credible media messages.

Health Beliefs

The HBMI was normed on a population consisting mainly of White and African-American participants. Given that the current sample mirrored this racial breakdown for the most part, reliability of scores appears to be consistent across both the instrument's

normative sample and the current study sample. However, it is noteworthy that future research using the HBMI should attempt to further validate the scales with a more diverse sample of participants. The HBMI also does not provide specific cutoff scores for what is considered to be low, moderate, or high. Below, I describe the scores based on where they fall within the measures of central tendency for the present sample.

Susceptibility. The average susceptibility score was about 7, with the highest possible score on the scale being 25. This low average score indicates that the average student did not feel they were personally susceptible to alcohol or drug abuse or dependence. The factors that go into how a person determines what they believe to be their own personal susceptibility to a health condition can vary. The invincibility that some young people often feel in terms of their health could be one element. This is reinforced for many college students because the peers they interact with on a daily basis are usually perceived to be physically and emotionally healthy enough to manage the demands of a collegiate curriculum without concerns of a mental health diagnosis.

Another consideration for personal susceptibility to a condition is having a family history. Family history of an alcohol abuse or dependence disorder heightens an individual student's risk. In the current sample, over 66% of students endorsed a family history of alcoholism which is at odds with their low perceived susceptibility. One explanation for this could be that as with many mental or emotional health issues, the stigma and perhaps awkwardness of talking about a student's biological predisposition and their alcohol use behaviors precludes discussion with their families. Subsequently,

lack of knowledge of a family history would not be factored into a personal assessment of susceptibility. It is also possible that a student does not associate a family member's struggle with alcohol as relevant to their own alcohol use. Feelings of specialness, a common developmental characteristic in adolescents and emerging adults, or self-assurance of not drinking in the same way as a relative who struggles, may preclude a student from linking personal susceptibility with that of a family member. Because of the sample's lowered susceptibility, the overall perceived threat (combination of perceived susceptibility and perceived severity) also was diminished. Low perceived threat makes behavioral changes related to risky alcohol use unlikely to occur.

Severity. Severity scores can range from 7-35. The average for the current sample was about 20 ($M = 19.86$). This moderate score indicates that the respondents did in fact subscribe to the belief that alcohol abuse is a serious condition. However, it was not found to be related to a student's drinking behavior. Despite a belief that alcohol problems are serious, students did not tend to moderate their drinking behavior based on this belief. This is in keeping with the prior discussion on susceptibility. Because their belief that they will be diagnosed with an alcohol use disorder is low, it is irrelevant to their drinking behavior whether or not the condition is severe. Respondents did not worry about a diagnosis; therefore the severity of the condition in question had no bearing upon their drinking behaviors.

Benefits. On average, perceived benefits was given a score of 10.66 on a scale from 4-20. This indicates that many participants believed that if they were to be faced

with an alcohol diagnosis, or if someone they knew had a diagnosis, there would be clear benefits to receiving treatment for this diagnosis. Because students were asked to think of how they might respond for a close friend if they themselves did not struggle with alcohol abuse, there may have been a sense of removal from their personal beliefs (“I would get help for an alcohol problem”) as opposed to what they believe is okay for others (“I would support a friend who needed help with an alcohol problem”). With a non-clinical population of college students, it might be prudent to rework some of the benefit items of the HBMI to inquire about the benefits of moderate drinking or abstinence from alcohol use to more accurately reflect the experiences of a population where the majority of respondents are not contending with the benefits of substance abuse treatment.

Barriers. Further research should try to help students identify and name their perception of what entities serve as barriers. Possibly, a need to fit in with others and match the perceived drinking level of peers is a desirable action for students. A barrier might include feeling one will be ridiculed or ostracized for not drinking at the same level as others. This behavioral barrier might induce a student to drink more heavily. Other barriers could possibly center on attitudes or beliefs about the centrality of drinking to the college experience. If a student believes college will not be enjoyable or memorable without excessive drinking, this attitudinal barrier could be important to know for researchers or student life professionals studying how to create effective prevention programming.

Overall, the findings from this research study fall in line with the theoretical foundation for the Health Beliefs Model. Two of the four directional hypotheses with the health belief constructs were substantiated. Among a sample of 18-24 year old college students, belief that one is susceptible to a condition like alcohol abuse does not appear to impact problematic drinking behaviors. Higher perceived benefits lower a student's overall consumption, and barriers to moderate drinking tend to increase problematic drinking. However, a closer examination of measures of central tendency in HBMI scores also indicate that students are endorsing lower levels of susceptibility, but moderate to higher levels of benefits, barriers, and severity. I believe that future research using health beliefs constructs with college students may need some exploratory work on finding which items college students perceive to be barriers and benefits. Further research is needed to see if the findings of the current research study can be replicated in additional samples of college students.

Limitations

Several limitations exist in the current study that may compromise internal and external validity of the results. . The convenience sampling method used in the current study limits generalizability due to a lack of random sampling. Additionally, sampling was done during summer sessions (July-August) as opposed to the academic year. This might have yielded differences in the type of student available for participation in the research study. It is possible that students taking summer school courses differ in some significant ways from students who do not choose to enroll during the summer sessions.

The study participants were also sampled solely from one region (Piedmont-Triad) of North Carolina. Extrapolating results outside of North Carolina or even the region might be difficult, given that students in different areas might have more or less different patterns of drinking based on location. Also, sampling conditions were not the same across all participants. Some instructors invited the researcher to sample at the beginning of class, the end of class, or during a break. Completing the assessments at different times may have introduced some additional variance that was not taken into consideration. Finally, the survey items were all self-report. Although measures were taken to stress the anonymity of the research study, it is impossible to determine the extent of under or over reporting alcohol use.

Implications

Student Alcohol Programming

Results from this research study may help guide student life professionals to build programs that tap into the most significant predictors of variance in drinking: perceived susceptibility, quantity norms, and perceived benefits. One of the hallmarks of the social norms approach was that it veered away from previous methods of fear-mongering through extolling the dangers of alcohol use in students. The current results suggest that beliefs about how much peers drank, perceived susceptibility of alcohol concerns, and benefits of moderate, non-binge drinking were more indicative of a student's drinking behavior than socio-demographic variables. These results indicate

programming, social marketing, and media messages that focus on susceptibility, quantity norms, and benefits of moderate drinking may be useful in prevention efforts.

One tactic on weaving susceptibility into media messages/campaigns would be to educate students about risk factors that increase susceptibility. As noted earlier, ignorance of a personal risk factor cannot be taken into consideration when a student is making a determination about how they consume alcohol. Additionally, messages that focus on the benefits of moderate drinking such as being able to remember everything that happened after an evening out and forming good college memories without blackouts might prompt students toward more moderate drinking. This introduction of health belief components into existing media messages on campuses about quantity norms might yield different results from current social norms campaigns in that individual beliefs are taken into account in addition to the drinking behaviors of an entire campus of peers.

Counseling Practice and Counselor Education

The current research provides results that may be relevant to college counselors working with students abusing alcohol. Often, use of alcohol may be exacerbating a student's depressive disorder or masking the effects of an anxiety disorder. Counselors who are met with resistance and denial when confronting students about alcohol abuse using traditional methods may try an approach that begins by eliciting beliefs and attitudes about alcohol use. This can serve as a foundation for having a conversation where a student is encouraged to think out loud about their personal values related to

alcohol use. Because social norms and what they see and perceive peers to be doing is such a strong motivator, most students probably rarely process with anyone how their beliefs impact their drinking. This gives counselors a unique opportunity to highlight a student's beliefs and challenge irrational beliefs. Once a set of beliefs has been established, students have another way to go about making decisions about their drinking beyond doing what they perceive their peers to be doing.

The Health Beliefs Model from the field of Public Health proved to be relevant to the area of alcohol abuse among college students typically addressed through the fields of counseling, psychology, and social work. This research has implications for practicing counselors and counselor educators to draw from theoretical models from other fields as a way of explaining behavioral health phenomena. This can be particularly helpful when a purely psychological approach makes some clients uncomfortable due to the perceived stigma of mental health issues. Sometimes drawing a client into the physical health realm makes the conversation about alcohol abuse more palatable and increases the likelihood of therapeutic gains by removing the barrier of stigma. Counselors should practice the ability to engage clients in both the mental and physical health realms as a general practice of holistic, whole-person development.

Future Research

This study serves as a first step of researching the utility of the Health Beliefs Model with college student alcohol use. Future researchers should continue to determine the impact of health beliefs on college student drinking behaviors. Studies

that are able to obtain random samples from a wider geographic area would address some of the limitations of the current study. More specifically, wording the items used to assess health beliefs components with statements more focused on college student's experiences may yield an even richer understanding of how health beliefs can be used to affect change on college student problematic drinking behaviors. Another useful study design using the health beliefs constructs might include a longitudinal study with a cohort of students to determine how or if beliefs change as developmental level increases from freshman year to senior year. It may be that certain health beliefs and social norms are more salient for determining drinking behaviors in individuals at a lower developmental level (i.e., freshmen, sophomores) because of the changing importance of health concerns and peer relationships as students develop. Other important factors to address in future research include how changes in socio-demographic variables and their relation to drinking evolve over time. Just as women have begun catching up to men in quantity and frequency of alcohol consumption, ethnicity may be another area in which the gap will begin to close over time.

Conclusion

The purpose of this study was to examine the relationships between health beliefs model constructs, social norms theory, and problematic drinking behaviors among college students. Analysis of these variables revealed significant relationships amongst the three constructs. Most significantly, health beliefs and social norms predicted a significant amount of variance in problematic drinking above and beyond

what is explained by socio-demographic factors. Future research is needed to further substantiate these findings and build upon them with health beliefs constructs specific to college populations. College counselors who approach students with problematic drinking patterns using health beliefs constructs, in addition to social norms, may be able to better effect change on drinking behaviors by tapping into the significant effects that beliefs have on drinking behavior.

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APPENDIX A

SAMPLE SCRIPT OF ORAL RECRUITMENT

Hello! My name is Denisha Champion and I am currently a doctoral student in the Counselor Education department at UNCG. I am in the process of completing my dissertation entitled “*College Student Alcohol Use and Abuse: Social Norms, Health Beliefs, and Selected Socio-demographic Variable as Explanatory Factors*” and I am here today to invite you to participate in my study.

This research study is open to full-time undergraduate students between 18 and 24 years of age. The study is examining relationships between student drinking behavior and peer drinking as well as what students believe about drinking and health. If you agree to participate in this study it should take about 15 minutes and I will ask for you to sign an informed consent form. I have additional copies of the informed consent if you would like one. If you would agree to take this survey, you will be asked questions about your own drinking behavior and your beliefs about drinking. You will also be asked about how much and how often you think specific groups of students are consuming alcohol. Does anyone have any questions so far?

You are not required to participate in this study. Your instructor has provided me with some class time so that if you would like to participate you may. Participation in this study is confidential. Your name will be provided on the consent form, but this will not be linked to your survey answers. This confidentiality is so that you can freely and honestly answer questions about your alcohol use, even if you are under the legal drinking age. Is there anyone here who would be willing to participate in this study? *<Researcher passes out pilot study assessment packet and informed consent documents to students who indicate a willingness to participate. Researcher then collects assessment packets and informed consent when complete.>*

As you take the assessments, please let me know if there is anything confusing or if you have questions about the items.

Please accept my sincere thanks for completing the survey for this research study as you have helped me to get one step closer to finishing my degree! Since this research asks about your drinking behavior, it may have brought up thoughts about your own alcohol use or that of someone close to you. At the front of the classroom I have left referral lists which you can pick up. They provide contact information for agencies both on and off-campus where you can find professional counselor to discuss concerns about alcohol use. Thank you!

APPENDIX B**SAMPLE PILOT RECRUITMENT EMAIL**

Hi Laura,

I am preparing to collect pilot study data next week for my dissertation entitled *College Student Alcohol Use and Abuse: Social Norms, Health Beliefs, and Selected Socio-Demographic Variables as Explanatory Factors*. I am hoping to be able to come to your CED 310 class on **Thursday March 29 at 10:15 a.m.** to solicit participants for my study. I estimate that it should take about 20 minutes (30 minutes max) of class time to explain my study and have those who are willing to participate complete a 49-question assessment packet. I would be so grateful if you have some flexibility in your lesson plans that would allow me some time in your class next week. Please let me know if the time I have suggested works or if there is another time that is preferable. Thank you so much for your kind consideration of my request.

Warmly,

Denisha Champion, M.S., NCC, LPCA

Doctoral Student

Department of Counseling and Counselor Education

University of North Carolina at Greensboro

APPENDIX C**SAMPLE FULL STUDY RECRUITMENT EMAIL**

Hello!

My name is Denisha Champion and I am a doctoral candidate at the University of North Carolina at Greensboro conducting my dissertation research. My study is entitled *College Student Alcohol Use and Abuse: Social Norms, Health Beliefs, and Selected Socio-Demographic Variables as Explanatory Factors*. This study has been approved by UNCG IRB and the <enter data collection site> IRB.

The population for my study is traditional aged (18-24) college students. In a survey of courses being taught this session, you have been identified as an instructor likely to have this population of students taking your course. I am writing to request 15 minutes of your class time this summer session to briefly explain the study and provide informed consent, recruit participants, and administer instruments to those students who are willing to participate. During my pilot study, the entire event including my presentation and time it took students to complete the instruments was about 15 minutes. If you are willing to allow me time, I would ask that you respond and let me know the preferred day and time you would have available and specifying your class location.

I am happy to come whenever is most convenient for you. If you are teaching several courses or different sections of the same course, I would be appreciative of the opportunity to come to all or any of the classes in which 15 minutes could be provided.

Sincerely,

Denisha Champion, M.S., NCC, LPCA

Doctoral Candidate

Department of Counseling and Counselor Education

University of North Carolina at Greensboro

APPENDIX D

ASSESSMENT INSTRUMENTS

Demographic Questionnaire

Gender Female Male**Classification** Freshman Sophomore Junior Senior**Ethnicity** Other _____ Pacific Islander Hispanic/Latino/a Asian-American African-American or Black Caucasian or White**Age** 18 19 20 21 22 23 24

Are you a member or pledge of a fraternity or sorority? Yes No

Are you a member of a University NCAA athletic team? (Not club sports) Yes No

How old were you when you had your first full drink of alcohol?

 11 or younger 15 12 16 I have never had a full drink of alcohol 13 17 14 18 or older

MALES ONLY: Think back over the last two weeks. How many times have you had five or more drinks in a row?

none once or twice 3-4 times 5-6 times 7-9 times 10 or more times.

FEMALES ONLY: Think back over the last two weeks. How many times have you had four or more drinks in a row?

none once or twice 3-4 times 5-6 times 7-9 times 10 or more times.

To your knowledge, do you have a family member (including aunt/uncle, grandparents) who abused alcohol?

Yes No

Are you currently or have you ever in the past been hospitalized or in intensive outpatient care for an alcohol-related issue?

Yes No

How many times have you been in trouble as a result of alcohol use (Judicial referral, DUI, underage drinking ticket)?

Zero

Once or Twice

More than 3 times

If more than zero, please specify:

Judicial referral through my university

Underage drinking ticket

DUI/DWI

Other: _____

Are you currently experiencing or have you ever been diagnosed with any of the following mental health conditions (check any that apply):

- | | |
|--|--|
| <input type="checkbox"/> Anxiety Disorder | <input type="checkbox"/> Eating Disorder (i.e., Anorexia, Bulimia, Binge Eating) |
| <input type="checkbox"/> Depressive Disorder | <input type="checkbox"/> ADHD/ADD (Attention-Deficit/Hyperactivity Disorder) |
| <input type="checkbox"/> Bipolar Disorder | <input type="checkbox"/> Other (please specify): _____ |

AUDIT						
Circle the option that best describes your answer to each question.						
Questions	0	1	2	3	4	
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?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more	
3. How often do you have six or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
4. How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
5. How often during the last year have you failed to do what was normally expected of you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
7. How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
8. How often during the last year have you been unable to remember what happened the night before because of your drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
9. Have you or someone else been injure because of your drinking?	No		Yes, but not in the last year		Yes, during the last year	

AUDIT						
Circle the option that best describes your answer to each question.						
Questions	0	1	2	3	4	
10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggest you cut down?	No		Yes, but not in the last year		Yes, during the last year	
					Total	

HBMI

Please circle the answer that best fits how you feel about each statement.

1. **There is a good possibility that I will develop alcohol problems in the next 3 years.**
 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

2. **Thinking about alcohol problems makes me worried or tense.**
 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

3. **I would be relieved if I were to go get help for alcohol problems.**
 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

4. **Friends, counselors, or RAs would not understand someone like me if I went to them for alcohol problems.**
 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

5. **I am more likely than the average student to have alcohol problems.**
 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

6. **The thought of having alcohol problems scares me.**
 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

7. **Getting help for alcohol problems would make me feel better about myself.**
 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

8. **My peers or family would think differently about me if I were to get help for alcohol problems.**
 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

9. **My chance of having or developing an alcohol problem is great.**
 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

10. I am afraid to think about alcohol problems.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

11. Getting help for alcohol problems would increase my ability to function at school and/or at work.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

12. Getting help for an alcohol problem would cost too much money.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

13. It is extremely likely that I will have alcohol problems in the near future.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

14. Difficulties I would experience with alcohol problems would last long after I am out of college.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

15. Getting help for alcohol problems would prevent major problems with family, friends, and other concerned individuals (i.e., Dean, counselors, professors).

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

16. Getting help for alcohol problems would take too much time.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

17. I feel I will develop an alcohol problem in the future.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

18. If I had an alcohol problem, my whole life would change.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

19. Getting help for alcohol problems is embarrassing.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

20. An alcohol problem would threaten relationships with my family or friends.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

21. If I developed an alcohol problem, I would not enjoy the same quality of life as other who do not have these problems.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

DNRF

INSTRUCTIONS		
<p>We are interested in your estimate of (A) <i>how often</i> and (B) <i>how much</i> different types of people drink. For the following questions, please assume whenever possible that you are <i>rating a typical person of your same sex</i>. In each of the following situations, please enter the corresponding number, giving one answer for (A) (1-7), and one answer for (B) (1-6).</p>	<p>A. HOW OFTEN THEY DRINK</p> <ol style="list-style-type: none"> 1. Less than once a month 2. About once a month 3. Two or three times a month 4. Once or twice a week 5. Three or four times a week 6. Nearly every day 7. Once a day 	<p>B. HOW MUCH THEY DRINK ON A TYPICAL WEEKEND EVENING</p> <ol style="list-style-type: none"> 1. 0 drinks 2. 1-2 drinks 3. 3-4 drinks 4. 5-6 drinks 5. 7-8 drinks 6. More than 8 drinks
1. An average college-bound senior in high school		
2. An average university student		
3. An average college student residing in a fraternity		
4. An average college student residing in a sorority		
5. An average college student residing in a dormitory/residence hall		
6. An average college student residing with his/her parents		
7. An average college student residing in his/her own residence		
8. Your closest friends		

APPENDIX E

INFORMED CONSENT

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO
CONSENT TO ACT AS A HUMAN PARTICIPANT: LONG FORM

Project Title: College Student Alcohol Use and Abuse: Social Norms, Health Beliefs, and Selected Socio-demographic Variables as Explanatory Factors

Project Director: Dr. Todd F. Lewis, Ph.D. Student Researcher: Denisha A. Champion, M.S.

Participant's Printed Name: _____

What is the study about?

This is a research project. The purpose of this study is to understand the beliefs college students like you have about their susceptibility to alcohol abuse or dependence diagnoses, and how severe or serious they believe alcohol problems are.

Why are you asking me?

We invite you to participate in this study to help us gain an understanding of the beliefs of college students about their personal health and wellness as it relates to alcohol consumption. You have been selected for this survey based on your current status as a traditional-aged (ages 18-24) college student enrolled at a 4-year university.

What will you ask me to do if I agree to be in the study?

The survey should take approximately 15 minutes to complete. You can decide to not participate at any time without penalty. If you feel discomfort at any time, please feel free to stop taking the survey.

What are the dangers to me?

The questions may cause you to have concern about your alcohol consumption. We have attached a referral sheet for assistance if you feel it would help you to discuss your concerns with a professional counselor or therapist. The Institutional Review Board at the University of North Carolina at Greensboro has determined that participation in this study poses minimal risk to participants. Questions regarding your rights as a participant in this project can be answered by calling Mr. Eric Allen at (336) 256-1482 in the Office of Research Compliance. Questions, concerns or complaints about this project or benefits or risks associated with being in this study can be answered by Dr. Todd Lewis by calling (336) 334-3422 or emailing tflewis@uncg.edu.

Are there any benefits to me for taking part in this research study?

Students who participate in the research study may gain insight and awareness into their own drinking behaviors and their personal health beliefs as a result of reading the survey questions and thinking about how to answer specific questions. In addition, the student researcher will make available the results (in written form) for any participant who is interested in the results of this project. There are no direct benefits for participating.

Are there any benefits to society as a result of me taking part in this research?

This research has potential benefits to both the fields of counseling and public health. College and university counselors as well as public health educators may gain a better understanding of the individual beliefs that college students hold that could allow them to more efficiently approach helping individuals.

How will you keep my information confidential?

All study data will be stored in a locked file cabinet and any data that is entered into computer software for analysis will be password protected. Participation in this study is confidential. 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 signing this consent form you are agreeing that you read, or it has been read to you, 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 signing this form, 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 the researcher.

Signature: _____ Date: _____

APPENDIX F**REFERRAL LIST****Referral List – Study 10-0421**

Participating in this study may have increased your awareness about the problematic alcohol consumption that you or someone close to you engages in. This referral list is to assist you in seeking consultation or treatment about any concerns you have about problematic drinking patterns.

The following resources are available on-campus at no or low cost to full-time students:

Counseling and Testing Center (free; cost already covered by your tuition/student health fees)
Student Health Services

The University of North Carolina at Greensboro

Anna M. Gove Student Health Center, 107 Gray Drive 27412

Greensboro, NC 27402-6170

336.334.5340

Nicholas A. Vacc Counseling and Consulting Clinic (free to student volunteers or \$5 per session)

Department of Counseling and Educational Development

223 Ferguson Building

cedclinic@uncg.edu

Phone: 336.334.5112

These resources are available in the surrounding community and may charge/accept insurance for substance abuse counseling services:

Moses Cone Behavioral Health

700 Walter Reed Drive

Greensboro, North Carolina 27403

(336) 832-9600

APPENDIX G

POST-HOC ANALYSIS

Gender Comparisons in Problematic Drinking

Correlations

		Audit_8	Women
Audit_8	Pearson Correlation	1	-.143*
	Sig. (2-tailed)		.017
	N	278	278
Women	Pearson Correlation	-.143*	1
	Sig. (2-tailed)	.017	
	N	278	283

* Correlation is significant at the 0.05 level (2-tailed).

Correlations

		Audit_8	Men
Audit_8	Pearson Correlation	1	.143*
	Sig. (2-tailed)		.017
	N	278	278
Men	Pearson Correlation	.143*	1
	Sig. (2-tailed)	.017	
	N	278	283

* Correlation is significant at the 0.05 level (2-tailed).

Men and women were compared in terms of problematic drinking. Being male was positively correlated ($r = .143, p < .05$) with problematic drinking, whereas being female was negatively correlated ($r = -.143, p < .05$) with problematic drinking. Correlations for both groups were statistically significant but not practically significant.

Campus Comparisons in Problematic Drinking

Correlations

		Audit_8	UNCG
Audit_8	Pearson Correlation	1	.007
	Sig. (2-tailed)		.907
	N	278	278
UNCG	Pearson Correlation	.007	1
	Sig. (2-tailed)	.907	
	N	278	283

Correlations

		Audit_8	NCAT
Audit_8	Pearson Correlation	1	-.090
	Sig. (2-tailed)		.136
	N	278	278
NCAT	Pearson Correlation	-.090	1
	Sig. (2-tailed)	.136	
	N	278	283

Correlations

		Audit_8	WFU
Audit_8	Pearson Correlation	1	.181**
	Sig. (2-tailed)		.002
	N	278	278
WFU	Pearson Correlation	.181**	1
	Sig. (2-tailed)	.002	
	N	278	283

** Correlation is significant at the 0.01 level (2-tailed).

Of the three campus variables, only Wake Forest University showed a statistically significant correlation with problematic drinking ($r = .181, p < .01$). Although the correlation is significant at the $p < .01$ level, practical significance is again questionable with a low Pearson's r value. Being a respondent from North Carolina A&T University was negatively correlated with problematic drinking, although not significantly so.

Athletic Participation Comparisons in Problematic Drinking

Correlations

		Audit_8	AthleteY
Audit_8	Pearson Correlation	1	.158**
	Sig. (2-tailed)		.008
	N	278	277
AthleteY	Pearson Correlation	.158**	1
	Sig. (2-tailed)	.008	
	N	277	282

** Correlation is significant at the 0.01 level (2-tailed).

Correlations

		Audit_8	NonAthlete
Audit_8	Pearson Correlation	1	-.158**
	Sig. (2-tailed)		.008
	N	278	277
NonAthlete	Pearson Correlation	-.158**	1
	Sig. (2-tailed)	.008	
	N	277	282

** Correlation is significant at the 0.01 level (2-tailed).

Being a member of NCAA athletic teams was positively correlated with problematic drinking among the sample ($r = .158, p < .01$). Non-athlete status was negatively correlated with problematic drinking ($r = -.158, p < .01$).

Ethnicity Comparisons in Problematic Drinking

Correlations

		Audit_8	White
Audit_8	Pearson Correlation	1	.129*
	Sig. (2-tailed)		.032
	N	278	277
WhiteY	Pearson Correlation	.129*	1
	Sig. (2-tailed)	.032	
	N	277	281

* Correlation is significant at the 0.05 level (2-tailed).

Correlations

		Audit_8	NonWhite
Audit_8	Pearson Correlation	1	-.129*
	Sig. (2-tailed)		.032
	N	278	277
NonWhite	Pearson Correlation	-.129*	1
	Sig. (2-tailed)	.032	
	N	277	281

* Correlation is significant at the 0.05 level (2-tailed).

Ethnic minority status was negatively correlated with problematic drinking ($r = -.129, p < .05$) whereas students of the majority ethnic group (White/Caucasian) were positively correlated with problematic drinking ($r = .129, p < .05$). The variable labeled White indicates students who identified as Caucasian. The Non-White variable includes every other ethnic group represented in the study.