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UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

STUDENTS' ATTITUDES AND PERCEPTIONS AS PREDICTORS OF DRINKING BEHAVIOR: IMPLICATIONS FOR STUDENT ALCOHOL EDUCATION PROGRAMS

A Dissertation

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF PHILOSOPHY

By

Robert M. Martin
Norman, Oklahoma
2000

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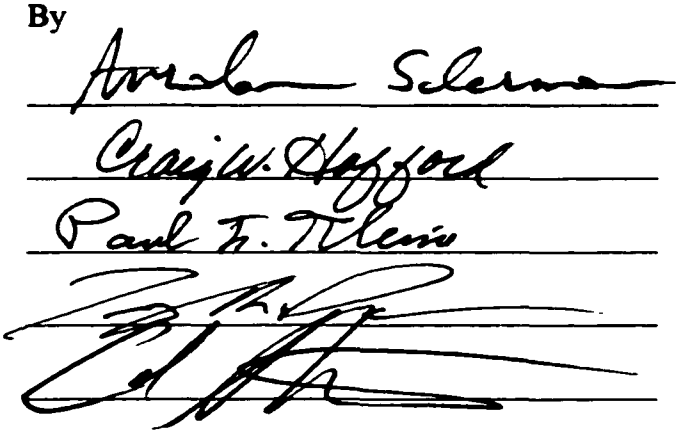
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A Dissertation
APPROVED FOR THE DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

By



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DEDICATION

I dedicate this dissertation to my wife, who loves me, my family, who supports me, and my Lord and Savior, who strengthens me.

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ABSTRACT

The primary purpose of the present investigation was to examine the relationship between attitudes, perceptual norms, and perceived risk of drinking behaviors and self-reported levels of drinking. In examining these associations, this study sought to provide support for Ajzen and Fishbein's (1977) theory of reasoned action. By simultaneously examining attitudes and beliefs about substance use, it was believed that the unique influence of each would be ascertained. As was predicted, drinking behavior was found to have a large association with personal attitudes toward drinking. In particular, the higher the quantity and frequency of alcohol use that students reported, the more acceptable their personal attitudes were toward alcohol use and associated behaviors, such as drinking to get drunk and pressuring people to drink alcohol. Although there was support for friends' drinking norms being moderately associated with actual drinking behaviors, drinking norms of others mostly had no association at all to the drinking behavior of participants. These associations were nearly zero. Thus, in this study the more that students reported using alcohol, the more they reported their friends as using alcohol, yet their drinking behavior was independent of the perceived drinking norms of other adults. Finally, the data from this study clearly indicate that perceived risk of alcohol use is a

crucial variable in explaining college students' alcohol use. Despite the desire to interpret causally this association, all that is presently known is that alcohol use and perceived risk of harm of alcohol use are strongly inversely related. This study provides firm support for being aware of students' attitudes toward drinking, the drinking norms of their friends, and their perceived risk of using alcohol. As universities develop and implement effective alcohol prevention and intervention programs.

INTRODUCTION

Background of the Problem

The present investigation involved the subject of alcohol use at the University of Oklahoma. The college experience is arguably one of the biggest developmental milestones in the lives of many people. It is a time when one begins to assume more adult roles and responsibility. For most beginning college and university students, college is a time of reduced parental supervision amidst many new social and academic pressures. Within this developmental experience, however, alcohol consumption is prevalent. This is particularly of concern given that only half of college undergraduate college students are legally old enough to drink (Johnson, O'Malley, & Bachman, 1994).

A survey conducted at the University of Michigan found that alcohol is used far more than other drugs by undergraduates as well as graduate students, faculty and staff (University of Michigan, 1993). A study at Louisiana State University revealed that 37% of the respondents drink once or twice a week while 4% drink daily (Grenier, 1993). Similar results were found by Haberman (1994) in which she found that 90% of college students currently used alcohol or have used at least once in the past; 39% reported consuming alcohol at least weekly and less than 1% reported daily use (Haberman, 1994). Furthermore, the University of Michigan survey (1993) indicated that 18% of undergraduates considered themselves as having serious alcohol problems and report patterns of problem drinking by their peers (University of Michigan, 1993). This problem is not unique to one university as researchers at the University of Nebraska at Omaha found heavy alcohol use to be accepted as normal consumption among the

students (Hunnicutt & Davis, 1989; University of Michigan, 1993). This heavy alcohol use is estimated to occur among 40% of the undergraduate population (U.S. Department of Health and Human Services, 1994).

Some researchers believe that a higher percentage of college men than women are likely to drink, drink more often, consume more, and experience more drinking problems (Engs & Hanson, 1990). However, other researchers suggest that when students' body weights are used to compare estimated blood alcohol levels instead of absolute amount of alcohol consumed, females and males do not differ in amount of daily alcohol consumption (Skacel & Merritt, 1991). Furthermore, it is purported that place of residence influences the consumption of alcohol and risk for alcohol related problems such as substance abuse, legal issues, as well as social and educational difficulties.

Specifically, one study suggested that students living in residence halls are at a higher risk for such problems than students living elsewhere (Barnes, Welte, & Dintcheff, 1992). Other studies have consistently found that college students who are members of fraternities and sororities consume more alcohol per week, engaged in heavy drinking more, and suffer more negative consequences from alcohol use than do nonmembers (Alva, 1998; Baer, Kivlahan, & Marlatt, 1995; Cashin, Presley, & Meilman, 1998).

In addition to demographic characteristics, attitudes about drinking, perceptions about drinking, and drinking behaviors have been investigated (e.g., Banks & Smith, 1980; Hamid, 1995; Klein, 1994). Of particular interest to the present investigation is the investigation by Baer, Stacy, and Larimer (1991) who examined the association between individual drinking patterns and the perceived drinking patterns of close friends and reference groups among college students. These investigators conducted two separate

surveys of college students from fraternities, sororities, and dormitories (N = 131; N = 280). Across both studies, students reported that their friends drank more than they did. Furthermore, the data revealed that students' reports of others' drinking were exaggerated in that students' estimates of average drinking within their own social living groups were substantially higher than the average drinking within the group estimated from self-reports. This study greatly underscored the importance of examining college students' perceptions of drinking, but is only one of a few such studies that have examined this issue.

Statement of the Problem

Although much of the literature suggests that attitudes toward alcohol consumption on college campuses are a great concern, there is a call for further research to help assess and identify problematic alcohol behaviors (Barnes, Welte, & Dintcheff, 1992; Haberman, 1994). In addition, effective intervention strategies are needed to address students' needs and help support responsible drinking patterns. Before a strategic intervention program can be developed, research is needed with regard to what variables predict alcohol use and what social psychological factors such as attitudes about drinking and perceptions about drinking are likely to influence changes in drinking behaviors. This information can help identify those "at risk" of alcohol interfering with their academics and personal lives as well as what prevention and intervention methods may be effective in decreasing this risk.

Purpose of the Study

Although previous studies have been completed concerning substance use by undergraduates, only limited studies have been conducted at the University of Oklahoma.

The present investigation sought to provide a comprehensive assessment of substance use of the undergraduate population on a university campus by not only assessing the amount of use itself, but numerous other variables, such as attitudes toward use and beliefs about substance use. Beyond just the identification of alcohol and drug using patterns at the University of Oklahoma, this university survey study examined the relative importance of personal attitudes towards drinking, perceptions of others' drinking attitudes, and perceptions of drinking norms in relation to personal drinking behavior. Thus, the primary purpose of the present investigation was to examine the relationship between attitudes, perceptual norms, and perceived risk of drinking behaviors and self-reported levels of drinking. By simultaneously examining the above variables, it was believed that the unique influence of each would be ascertained.

A second purpose for conducting this study was to understand the particular drinking and drug use patterns of undergraduate students at the University of Oklahoma. The results of this study will be used to discuss implications for an appropriate student assistance program directed toward both prevention and intervention of abusive alcohol behaviors. Developing strategies without first assessing the nature and magnitude of perceived problems could be both costly and detrimental to the university as well as the people effected by the premature intervention. The results of the present study will also be used to guide future research with regard to correlates of the college drinking experience.

Theoretical Rationale

The predictions of this investigation are largely based upon the theory of reasoned action (Ajzen and Fishbein, 1977). This theory is most applicable to the present

investigation because it applies the two primary variables being used to predict drinking behavior: (a) subjective norms and (b) attitudes. This theory suggests that these two dimensions contribute to the prediction of behavioral intentions, which are good predictors of human behavior. This theory will be reviewed in more detail with the literature review. To date, Ajzen and Fishein's theory has been supported by numerous researchers as being able to predict alcohol use among college students (e.g., Laflin, Moore, Weis, & Hayes; O'Callaghan, Chant, Callan, & Baglioni, 1997; Trafimow, 1996).

Although the theory of reasoned action provided a solid basis for the prediction of alcohol use, the theoretical foundation of this investigation also rests on the several other theoretical perspectives. In particular, because alcohol use is considered a health behavior, the dominant theories that pertain to health behavior change provide an appropriate backdrop for understanding alcohol use. These theories include: the Health Beliefs Model and the Stages of Change Theory.

The Health Belief Model (HBM) was originally formulated in the 1950s and proposes that understanding individuals' perceptions related to the disease and the desired behavior change largely explain health behaviors. In sum, the HBM proposes that in order for a person to engage in a health behavior, they must perceive the "disease" as severe and personally threatening. Additionally, the HBM posits that in order for behavior change to occur benefits of the behavior change must outweigh the barriers to making the change.

The Stages of Change theory provides an understanding of how the change process occurs, which is particularly relevant when discussing how to change alcohol use among college students. In this theory, there are five stages of change: (a)

precontemplation, (b) contemplation, (c) decision, (d) action, and (f) maintenance. The progression through these stages is not linear; individuals progression forward and backward from stage to stage at different times in the change process. The final goal, however, is that individuals end up in maintenance in which they are doing the things necessary to maintain the change.

As with the theory of reasoned action, both of these theories provides a different perspective on helping to understand health behaviors and are elaborated upon further in the literature review chapter. The HBM is particularly useful in helping to understand alcohol use and why, despite knowing the dangers of such use, college students continue to engage in the unhealthy behavior of excess alcohol consumption. On the other hand, the stages of change model is helpful in understanding "how" individuals change/modify their behavior toward alcohol use. Thus, although the theory of reasoned action serves useful for the specific predictions made in this study, these health change theories assist in understanding the behaviors and in formulating prevention and intervention efforts. At this juncture, it is now sufficient to provide the predictions that the theory of reasoned action supports.

Research Questions and Hypotheses

The hypotheses for this investigation were examined by looking at the data collected by this researcher at the request of a local community prevention coalition (Higher Education Committee) during the dates of January 1, 1997 through May 1, 1997.

This investigation was designed to examine one primary research questions.

RQ1: Which of the following is most highly related with specific drinking behaviors?: (a) attitudes toward drinking, which include personal attitudes toward

drinking, perceptions of friends' attitudes toward drinking, and perceptions of others' attitudes toward drinking; (b) perceptions of drinking norms, which includes perceptions of friends' drinking levels and perception of others' drinking levels; or (c) perceived risks of alcohol use.

This research question was examined by testing three relevant hypotheses.

H1: Attitudes will be positively related with actual drinking behavior. More specifically, it is expected that:

H1a: Personal attitudes toward drinking will be positively related with actual drinking behaviors, consistent with the research of Banks and Smith (1980), Mills and McCarty (1983), Ratliff and Burkart (1984), and Hamid (1995).

H1b: Perception of friends' attitudes toward drinking will be positively related with actual drinking behaviors.

H1c: Perceptions of others' attitudes toward drinking will be positively related with actual drinking behaviors.

H2: Perceptions of drinking norms will be positively related to actual drinking behaviors. More specifically, it is expected that:

H2a: Perception of friends' drinking levels will be positively related to actual drinking behaviors.

H2b. Perception of others' drinking levels will be positively related to actual drinking behaviors.

H2c: Actual drinking behaviors will be more closely related to the perceptual norms of friends' drinking levels than the perceptual norms of others' drinking levels', consistent with the research of Baer et al., (1991).

H3: Perceived risk of alcohol use will be significantly related to actual drinking behaviors.

RELATED LITERATURE

Literature on Alcohol Use in Colleges and Universities

Straus and Bacon (1953) were among the first researchers to examine the prevalence of drinking behavior that occurred on college campuses. In a national sample of approximately 15,000 college students, these authors reported that approximately 70% of students in American colleges and universities at least occasionally consumed alcoholic beverages. Saltz and Elandt (1986) reviewed the principal survey studies that had been conducted since the mid 1970s and reached a similar conclusion. The consumption by college students of at least one alcoholic beverage per month was approximately 90% across all studies. Although men on average consumed alcoholic beverages more than women, this difference was not consistent across studies. For men, the range of at least one alcoholic beverage per month was 91% and ranged from a low of 81% to as high as 98%. The average consumption across studies for women was 88%, but ranged from 78% to 98%. These drinking rates do not appear to be declining over the years. Across all studies, the average reports of students who are problem drinkers ranges from 10% to 25%. Approximately 4% to 5% of students are estimated to use alcohol on a daily basis.

The prevalence of alcohol use among college students still appears high in the current decade. In a study of college students at Louisiana State University, Grenier (1993) found that 37% of the students drank once or twice a week and that 4% consumed alcohol on a daily basis. The majority of the students sampled in their study reported that they drank to relax whereas only 35% reported that peer pressure motivated them to

drink. Additionally, Grenier found several factors which were associated with high alcohol consumption: (a) being male, (b) being in a Greek fraternity, (c) being a junior year student, (d) living off-campus, and (c) being of Caucasian ethnicity.

In a sample of 457 students at the University of Alberta, Canada, Svenson and Jarvis (1994) found that 90% of the students reported drinking at least once over the past year. In their study, they found that men were more likely to be heavier drinkers than women and that men were more likely than women to drive while intoxicated. Furthermore, these authors reported that the women in their sample overall had healthier attitudes concerning alcohol use. Men were more likely than women to indicate that it was socially acceptable to be intoxicated and that drinkers do not suffer health problems as the result of drinking.

In a study of students at Rutgers University, O'Hare (1990) reported that 18% of their undergraduate sample were abstainers, 25% were light drinkers, and 19% were heavy drinkers. These authors also found that the number of abstainers declined with each year in college in that 29% of freshman were abstainers compared with only 9% of seniors. Furthermore, the number of heavy drinkers increased by year from 15% in freshman to 24% in seniors.

However, in reviewing the prevalence of alcohol use across universities it must be kept in mind that differences in geography exist. That is, the reports of alcohol use may be different across varying regions. The differences between campuses in alcohol use may be more reflective of the spurious influence of differences in geography than of anything else.

Nevertheless, in their annual national study of over 1,000 student per year, Johnston, O'Malley, and Bachman (1994) conclude that little decline in alcoholic consumption is occurring—especially among college students who report drinking five or more drinks at once (i.e., binge drinking) in the last two weeks. Furthermore, estimates of the proportion of college students who regularly engage in binge drinking has been estimated as being approximately 20%. Johnston et al. report that alcohol continues to be the most widely abused drugs and that binge drinking is extremely prevalent among American college students. Rabow and Newman (1984) have also observed that weekend binge drinking is the most common abuse of alcohol in this population.

Additionally, drinking among college students has been found to be associated with numerous individual and social problems. For instance, Berkowitz and Perkings (1986) have found that drinking problems among college students is associated with vandalism, difficulties with academic performance, accidents, and engaging in risky behaviors, such as driving while intoxicated and having unprotected sex. It has also been proposed that students with alcohol problems are less likely to become employed because of their poor academic performance (Lall & Schandler, 1991).

Universities are motivated to reduce problem drinking because of the associated social problems that impact the college community. Several problems are of predominant concern in the campus community. Public safety is one of the biggest concerns where behaviors, such as drinking and driving, assault, rape, alcohol poisoning, and personal injuries resulting from engaging in uninhibited behaviors, can have a substantial impact on the community as a whole. Additionally, social consequences such as these are most likely to receive media attention, which is generally not desired by the

college or university. These situations place universities in a reactive, rather than proactive, preventative position.

Grenier (1993) provided data on the frequency of alcohol-related problems experienced by college students. In his study of Louisiana State University students, 26% reported drinking and driving, 20% reported missing class due to having a hangover, and an inverse association between grade point average and drinking behavior was observed. Regarding attitudes toward drinking, Grenier found that 60% of LSU students felt that getting drunk was a normal part of the college experience and 57% felt that parties were more fun after having a few drinks. Reassuring, however, was the finding that 77% of students would use a free ride home if they were intoxicated and that 87% reported that they would stop a friend from driving while drinking.

Similarly, Globetti, Stem, Marasco, and Haworth-Hoeppner (1988) found that 33% to 41% of college students reported drinking and driving, 6% to 7% reported engaging in alcohol-related vandalism, 7% to 8% reported losing friends as the results of their alcohol usage, 17% to 23% reported experiencing alcohol-related academic problems, and 3% to 15% reported having problems with authority because of alcohol.

The high level of alcohol use and alcohol problems among college students is surprising given that persons with more education are more likely than others to adopt, and engage in, healthier behaviors. For instance, when compared with individuals without a high school diploma, college graduates have a lower prevalence of smoking, are less likely to be overweight, and are more likely to use seat belts when driving (Wechsler & Isaac, 1991).

Several studies have attempted to identify the predictors of alcohol use among college students. Haworth-Hoeppner, Globette, Stem, and Morasco (1989) found that attitudes toward alcohol actually affect drinking behavior. Students at a southern university with more permissive attitudes toward alcohol use were more likely than others to be heavy drinkers. Haden and Edmundson (1991) found that students used illicit drugs out of personal motivation but that the strongest predictor of alcohol use was social motivation. Several theories have been proposed that attempt to predict the drinking behavior of undergraduate college students. These theories will next be reviewed.

Theories of Drinking Behavior

In general, there are three common theoretical approaches to explaining drinking behavior (Edmundson, Clifford, Serrins, & Wiley, 1994). The first is a knowledge and attitudes approach. In this model, it is believed that by providing accurate knowledge regarding the negative consequences of alcohol and drug use will instill negative attitudes toward the use.

The second approach is a values and decision-making model. This perspective focuses on individuals' needs and values, and how substances fulfill these needs and influences these values. Decision-making skills are taught to enhance personal responsibility and self-reliance. Ideally, these skills and self-awareness should promote the notion of responsibility toward substance abuse (Edmundson et al., 1994).

The third approach is the social competency model, which was influenced by Bandura's (1986) social learning theory. In this approach, social situations, modeling, and social environments dictate the acquisition of individual psychosocial skills. A

deficiency in these skills places the individual at higher risk for substance abuse. Rectifying these deficiencies is believed to modify attitudes and behaviors toward drug taking (Edmundson et al., 1994). However, empirical research has only recently begun to test these assumptions regarding substance abuse prevention programs. These three perspectives have not yet been evaluated for their long-term efficacy, but early findings are promising.

In general, a cornerstone of research in the area of substance abuse has been centered on attempting to understand the reasons for drug and alcohol use. Many believe that this understanding will provide the ability to accurately predict substance abuse, and to perhaps even substance use. To this end, the theory of reasoned action, by Ajzen and Fishbein (1977) has been adopted by the drug and alcohol field as one way to understand this potentially self-destructive behavior and will be the primary theory of this investigation.

Theory of Reasoned Action

According to the theory of reasoned action, actual behavior is a direct function of behavioral intentions. Specifically, this theory proposes that subjective norms, which are the sum of beliefs and motivation to comply, contribute to understanding behavioral intentions. Additionally, attitudes, which are considered to be the sum of belief and evaluation, also contribute to behavioral intentions. Both subjective norms and attitudes lead to behavioral intentions. Once behavioral intentions are known, the actual behavior can be predicted. Additionally, the strength of the relationship between behavioral intentions and actual behavior is directly related to the extent to which the individual can determine the occurrence or nonoccurrence of the behavior.

Many studies have supported the efficacy of the theory of planned behavior, a revision of the theory of reasoned action, in explaining and predicting alcohol use, (Ajzen, I. 1985). For example, Marcoux and Shope (1997) recently examined both the theory planned behavior and the theory of reasoned action in the prediction of actual alcohol use among 3,946 5th-8th grade students in southeast Michigan. The intention to use alcohol explained 38% of the variance in frequency of alcohol use and 26% of the variance in alcohol use. Furthermore, attitudes, subjective norms, and perceived behavioral control—the three primary components of the Theory of planned behavior—explained 76% of the variance in the intention to use alcohol. These researchers reported, however, that despite the fact that both models were efficacious in predicting intention to use alcohol, the theory of reasoned action was more effective than was the theory of planned behavior.

These theories have also been successful in predicting alcohol use in young adults. For instance, in a sample of 122 college students, O'Callaghan, Chant, Callan, and Baglioni (1997) found that intentions to drink alcohol were predicted by subjective norms, attitudes, and perceived behavioral control and that intentions themselves were significantly predictive of self-reported use. These authors also reported, however, that past alcohol use was one of the strongest predictors of the intention to use alcohol and suggest that this variable be considered in a revision of the theory.

In a study of 250 college students, Trafimow (1996) found that attitudes were consistently better predictors of intentions to use alcohol than were subjective norms. However, this study found that this association depended upon which type of social drinking was being asked about. In particular, the association between attitudes and

behavioral intentions was strongest when predicting drinking enough alcohol to get drunk and weaker when asking about avoiding drinking and drinking enough to get a slight buzz. In contrast to the previous study, however, this author found that previous behavior and perceived behavioral control were significant predictors in predicting these three behaviors.

Another investigation by Laflin, Moore, Weis, and Hayes (1994) provides support for the theory of reasoned action. In a sample of 2,227 high school and college students, these authors found that attitudes and subjective norms related to alcohol and drug use did significantly predict alcohol and drug use, respectively. In another investigation on college students, Budd and Spencer (1985) examined 172 university students and found that normative beliefs about alcohol use did not predict behavioral intentions as the Theory of planned behavior predicts. These authors did find, however, that behavioral intentions mediated the relationship between attitudes and subjective norms in the prediction of alcohol use.

This theory has also been widely applied to other health-related areas. For example, Sutton, McVey, and Glanz (1999) found support for the application of both the theory of reasoned action and the theory of planned behavior in predicting condom use in a national sample of 949 English youth. Humphreys, Thompson, and Miner (1998) found full support for the postulates of the theory of reasoned action when examining breastfeeding among a sample of 1,001 socioeconomically disadvantaged pregnant women. Additionally, Moore, Barling, and Hood (1998) found that the theory of reasoned action was strongly supported in predicting testicular and breast self-examination behavior among 116 male and 141 female adults, respectively.

In sum, the theory of reasoned action predicts that alcohol and drug attitudes and subjective norms are useful in predicting drug and alcohol use (Laflin, Moore-Hirschl, Weis, & Hayes, 1994). Thus, the present investigation uses the theory of reasoned action to predict that alcohol-related attitudes and norms will be predictive of drinking behavior. Yet, this theory does not entirely account for the use of perceived risk as a predictor of drinking behavior. This review will focus on a rationale for the inclusion of perceived risk as a prediction dimension of substance abuse after discussing the other theoretical models relevant to the present study.

Because alcohol use can be conceptualized as a health behavior, it is important to review the major models that have been used in the literature to explain, predict, and change health-related behaviors. In an attempt to explain these complicated behaviors, theorists have integrated psychological, environmental, and social factors into their theories. This review will focus on reviewing two of the major models in this area: Health Belief Model and the Stages of Change Model, (National Institute of Health, 1997).

Health Belief Model

The Health Belief Model (HBM) was originally developed in the early 1950s and was one of the first health behavior models developed to explain and predict preventative health, sick-role, and illness behaviors. Developed by Godfrey, Hockbaum, and Rosenstock (cited in Glanz, Lewis, & Rimer, 1990), the HBM helps to explain why individuals make particular health behavior decisions and has been widely used to create health prevention programs. The model integrates several theoretical perspectives, including social psychology and phenomenology, but relies heavily on Kurt Lewin's

view that individual perception largely determines behavior. Although the model originally concentrated on the association between health behaviors and the utilization of health services, later revisions of the model included motivational factors. The HBM was developed to help explain and predict why individuals failed to engage in preventative behaviors. One of the first studies to test the efficacy of the HBM was conducted by Hochbaum (1952). In this study, Hockbaum systematically examined the factors that contributed to patients' decisions to obtain chest x-rays for detecting tuberculosis. Since this landmark study, however, the HBM has been applied to various different kinds of health behaviors.

According to the HBM there are five dimensions that contribute to behavior change. These dimensions include: (a) perceived severity, which refers to the degree to which individuals believe that the health problem is serious; (b) perceived threat, which refers to the extent that individuals believe that they are personally vulnerable to the health problem; (c) perceived benefit, which refers to the extent to which individuals believe that engaging in a particular behavior will diminish the perceived threat; (d) perceived barriers, which refer to the obstacles that individuals believe exist in order for them to change their current behavior; and (e) self-efficacy, which refers to the beliefs individuals have regarding their ability to change their behavior (Glanz, Lewis, & Rimer, 1990).

In evaluating the perceived severity, individuals form an impression of how serious the effects of a given health problem will have on their functioning. Individuals are believed to evaluate a wide spectrum of dimensions when examining severity, such as

the effect on their personal and work functioning, financial difficulties, burdens on family and friends, the degree of pain experienced, and other relevant factors.

In considering perceived threat, this model proposes that there is tremendous inter-individual variability in perceptions of being vulnerable to a health problem. Individuals that are high in this dimension feel that there is a real danger that they can be personally be affected by the medical condition or disease. At the other end of the spectrum, individuals low in perceived susceptibility are in denial that they could potentially contract the disease.

The third perception that relates to health-related behaviors involves the perceived benefits of taking action. Individuals must perceive that specific actions will result in the prevention of the disease or in dealing with the medical problem. This perception is believed to only occur after individuals have recognized that they are susceptible to the disease. Thus, beliefs about the benefits of action play a vital role in determining if appropriate health-related behaviors are performed.

Similarly, perceptions pertaining to the barriers to taking action also play a direct role in determining if individuals will engage in specific behaviors. There are many instances in which individuals may have perceptions of severity, feel personally threatened, and believe in the benefits of taking action, but not take the action because there are too many perceived obstacles to doing so. According to the HBM, barriers can come in many forms but generally relate to the inconvenience, cost, and emotional and physical pain related to taking the action

Lastly, if individuals do not have sufficient self-efficacy regarding their ability to change, they will be less likely to engage in the health-promoting behaviors. The

personal beliefs regarding their own abilities will play a tremendous role in determining whether individuals will engage in appropriate health behaviors—even when the aforementioned perceptions are positive. Furthermore, this theory also proposes that there must be cues to action in order for individuals to engage in the appropriate behaviors. This means that either internal or external cues must exist to trigger the behavior that is necessary to prevent or deal with a particular health problem or disease. It is also believed that certain demographic, sociological, and structural variables that can serve to influence individual's decision.

Although the HBM provides a concrete way of understanding health behaviors, it is not without its limitations. For instance, the model has been criticized for focusing too heavily on beliefs and ignoring other pertinent factors that may influence health behaviors, such as previous experience and cultural and socioeconomic influences. has not always been supported by the empirical literature. Some propose that it is for this very reason that the research on HBM is not entirely supportive of the theory. However, it is also important to recognize that the studies that have been done on HBM utilize different questions to examine the same beliefs, thereby making the results of the studies difficult to compare.

The HBM has been widely used in research on health behaviors but has been less widely used than the theories of reasoned action and planned behavior in studying alcohol use. Still, several studies have supported the application of this theory to alcohol use. One of the most notable studies in this area was conducted by Minugh, Rice, and Young (1998) on a sample of 41,104 adults. These authors found that health beliefs and behaviors were significantly correlated with alcohol use, even after controlling for

demographic influences. Furthermore, the HBM was supported equally for men and women; no gender differences were found. Sands, Archer, and Puleo (1998) examined the HBM in 125 and 231 female college students and found that risk of alcohol abuse was significantly predicted by perceived severity and barriers, self-efficacy, and social influences. Thus, there is a sound empirical basis in applying this theory to alcohol use in a college population.

Stages of Change Model

The Stages of Change Model (Prochaska, 1979) is another concept that is widely used in explaining health-related and the addiction behaviors. It was originally developed as a component of the Transtheoritical Model of behavioral change, but since it's conception, researchers have found that the biggest contribution of the Stages of Change (sub)model is in its explanation of how—but not necessarily why—behavior change occurs. This model proposes five stages of change, including: (a) precontemplation, wherein individuals are not considering behavioral change; (b) contemplation, where individuals begin to consider changing their behavior; (c) decision, where individuals decide they will change their behavior and actively create a plan on how they will do it; (d) action, where individuals implement their behavior-change plan; and (e) maintenance, where individuals maintain their behavior change and continue the beliefs and behaviors responsible for such a change (Glanz, Lewis, & Rimer, 1990).

According to this model, individuals go through the steps in a spiral/circular nature rather than linear one. That is, there is a movement into and out of various cognitive stages, sometimes individuals are progressing forward, slipping backwards and at times, skip over stages altogether. The model recognizes that there are times in

individuals' lives where change is more difficult than other times. In applying this model, most health programs focus on assisting individuals to advance their stage of change so that they will be closer toward the desired behavior change (Glanz, Lewis, & Rimer, 1990). This theory is widely used in the treatment of chemical dependency rather than prevention, which is the focus of this study. This investigation does not provide the adequate data to examine the stages of change model. Thus, the theory of reasoned action and the health belief model are the primary theories used to address the hypotheses in this study. However, the stages of change theory will be extremely useful to universities as very develop their intervention programs.

Perceived Risk and Substance Abuse

Perception of risk has been found by other investigators to actually decrease substance abuse (Bachman, Johnston, & O'Malley, 1988). For instance, from their empirical investigation of the influence of perceived risk on substance abuse, Gonzalez and Haney (1990) commented, "...it is evident from the results of this study that perceptions of risk significantly predict usage patterns and attitudes toward the use of various drugs" (p. 314). Additionally, Gonzalez (1989) suggested that the perceptions of risk regarding the use of substances is an important mediating variable in motivating students to engage in preventative behavior.

A study by Bachman, Johnston, and O'Malley (1988) found that the most significant predictor of alcohol use was the perceived risk of alcohol. Perception of risk was also significantly predictive of tobacco use, but the ability for it to predict cannot be generalized to all substances; Bachman et al. found that the predictability of risk is specific to each substance. This author states that to affect the perception of risk of a

given substance, the information must be specific for each substance and disseminated from a source that has a perception of accuracy and provides the information in sufficient enough detail. Thus, it is recommended that methods need to be incorporated that will influence the perceived risk of those substances where inaccurate perceptions of risk exist.

Rhodes, Corby, and Wolitski (1990), however, pointed out that perceptions of risk can be overridden. In their investigation, intravenous drug users continued to share needles even after understanding the risk of contracting the HIV virus. The exact factors that contribute to this are not yet fully understood.

History of Alcohol and Drug Use at the University of Oklahoma

To date, one of the largest nationwide studies on alcohol and drug use among college students has been the CORE Alcohol and Drug Survey (Presley, C. A., Leichliter, J. S., & Meilman, P. W., 1999). The University of Oklahoma did participate in this study during the 1995-96 data collection. In a report to the Presidents of the participating Universities, Presley et. al. (1999), reported that students drink an average of 5.1 drinks per week and 42.7% of students in the sample engaged in binge drinking at least once during the two weeks prior to completing the Core survey. Of the students who reported being under the age of 21, 82.4% reported using alcohol within the year prior to completing the survey and 68.8% reported using alcohol within the 30 days prior to completing the survey.

The issue of Alcohol and Drug use at the University of Oklahoma was first presented to investigators by a local prevention coalition (Higher Education Committee). The Coalition had become aware of a similar study conducted at the University of

Michigan in 1993 and decided to pursue assessment of the same information for OU. After looking into what resources would be needed to conduct such a study, the coalition agreed to fund a pilot study to start the process. The pilot study included students, faculty and staff and was administered by a mail-out survey through regular and campus mail. Although the response rate for undergraduate students was approximately 35%, the response rates for the faculty and staff were below 20%. Due to these response rates and the limited resource left over from the pilot project, this study was limited to the undergraduate population. Also, due to the cost and low response rates in the pilot project, the administration of the surveys used in this investigation was completed through group administration rather than mail-out.

METHODOLOGY

Methodological Approach

This investigation was archival in nature in that the analyses were based upon a survey conducted by the University of Oklahoma. The data used to test the hypotheses set forth in the present investigation were collected using the survey methodology, which allows for both descriptive and correlational uses. Because the hypotheses in this study were correlational in nature, the present study mostly emphasizes the correlational approach. The survey used, employed a self-administered, self-report format versus conducting the survey via an in-person or telephone format. This modality was most appropriate given that the objective was to reach a wide audience of the university population in a short period of time. Additionally, the use of an anonymous self-report survey greatly reduces socially desirable responding whereas the other survey methodologies would likely increase the chances of this response bias occurring.

Although this study was correlational in nature, drinking behavior was considered the primary dependent variable. Four different drinking variables, which measured four different types of drinking behaviors, were used in combination as the dependent measure. These included: (a) controlled drinking, as measured by participants' self-reported drinking behavior; (b) getting drunk, as measured by participants' report on the number of times they got drunk in the past year, (c) binge drinking, as measured by participants' report of the number of times in the last two weeks they had five or more drinks in a row; and (d) how many drinks per week students report consuming.

This study also examined six other dependent variables that were correlated with actual drinking behavior: (a) personal attitudes toward drinking; (b) perceptions of friends' attitudes toward drinking, (c) perceptions of others' attitudes toward drinking; (d) perceptions of drinking norms, as assessed by perceptions of friends' drinking levels; (e) perceptions of drinking norms, as assessed by perceptions of other students' drinking levels; and (f) perceived risks of alcohol use.

Selection of the Sample

A final sample size of $N = 690$ was obtained from the 1,000 students sampled resulting in a 69% response rate. The 1,000 students sampled represented a probability sample of randomly selected undergraduate students at the University of Oklahoma collected in the spring semester of 1997. A list of undergraduate courses was randomly selected until the total enrollment of classes was over 1,000 students. The list of class enrollment status was obtained from the University administration. Given that a sample size of 100 is all that is all that is necessary to obtain statistical power at .80, assuming an alpha of .05 and a medium effect size (i.e., $r = .30$), the final sample size of $N = 690$ had sufficient statistical power to reject the null hypothesis when it is false (Cohen, 1988).

After permission was granted from each course instructor, the researchers presented the study to the students and the surveys were distributed. All surveys were collected during the following class period. It was made clear, through a handout and the class presentation, that participation is the study was completely voluntary. Although the distribution of gender and classification was expected to represent the general university population, this was not the case. The sample contained 38% males and 62 % females, while the university reported a gender ratio is approximately 50/50. With regard to

classification, this sample contained 25% freshmen, 31% sophomores, 22% juniors and 22% seniors. These results are not consistent with the university in that while the first three classes are relatively equal (approximately 21% each), there are approximately 11% more seniors enrolled in the university than in each of the other three class (32% of the enrollment). Due to this inconsistency, any analysis across gender or classification should be interpreted cautiously. Participants were expected to benefit from this investigation through the knowledge gained from the data they provided. Due to the voluntary and anonymous nature in which the survey was returned, there was absolutely no risk to the participants in this study.

The Survey

The data for this investigation were collected from the administration of the Use of Alcohol, Tobacco, and Other Drugs in the Community Survey, which was developed by the University of Michigan's Initiative on Alcohol and Other Drugs (Hamid, 1995). The survey was originally developed to gather data to assist in identifying trends and changes, identify individuals who may be at high-risk, and to help in designing alcohol and drug prevention programs. Hamid (1995) reported this index as having a Cronbach coefficient alpha of .94. The large significant association between personal attitudes toward alcohol use and actual drinking behavior ($r = .67$) found by Hamid (1995) supports validity of this index. This questionnaire is shown in Appendix B.

The questionnaire contains a total of 60 items, many of which have several responses within them. Forty-one items are designed to measure five domains related to alcohol and drug use: (a) the frequency of the consumption of alcohol, tobacco, and illicit, prescription and over-the-counter drugs; (b) the problems that occur as the result of

such usage; (c) the place and social circumstances of the consumption of alcohol; (d) the strategies used to regulate drinking; and (e) the perceptions of norms and attitudes about drinking and drug use that are present in community and peer groups. The last 19 items ask relevant sociodemographic and descriptive information, such as respondents' ethnicity and religious affiliation.

In the present investigation, the focus is on actual drinking behaviors, personal, friends', and others' attitudes toward drinking, drinking norms, and perceptions of the risk of alcohol use. Other items will be examined on an exploratory basis and will not be reviewed in depth here in this report.

Actual Drinking Behavior

Four items on the survey were used to assess participants' actual drinking behavior, the main dependent variable for this study: (a) item 5a-c, (b) item 9a-c, (c) item 11, and (d) item 12. Item 5a-c asks participants, "On how many occasions (if any) have you had alcoholic beverages to drink?," and asks them to rate their response to this question from 1 (0 occasions) to 7 (40+ occasions). Participants rate their response in reference to three different temporal durations: (a) "in your lifetime?" (5a), (b) "during the last 12 months" (5b), and (c) "during the last 30 days" (5c). Total scores for this question can be obtained by summing the responses to 5a, 5b, and 5c. Thus, scores can potentially range from 3 to 21, with higher numbers being indicative of higher drinking behavior.

Using a similar format used by item 5a-c, item 9a-c asks respondents about the number of times they have been drunk: "On how many occasions (if any) have you been drunk or very high from drinking alcoholic beverages?" The same 7-point rating scale

that is used in item 5a-5c is also used in item 9a-c (i.e., 0 occasions = 1 to 40+ occasions = 7). Ratings are provided for drunk occasions over their lifetime, the past 12 months, and the past 30 days, as was done for item 5a-c.

In item 11, respondents are asked, "Over the last two weeks, how many times have you had five or more drinks in a row?" Participants are given the definition of a drink as being "... a glass of wine, a bottle of beer or wine cooler, a shot of liquor, or a mixed drink." They are then to choose one of the six responses: (a) "none" (1), (b) "once" (2), (c) "twice" (3), (d) "3 to 5 times" (4), (e) "6 to 9 times" (5), or (e) "10 or more times" (6). Item 12 asks participants to write in a number in response to the question, "What is the average number of drinks you consume a week?" The responses provided to these last two questions will serve as their score on these items.

To assess the hypothesis, the above-mentioned items were combined into a linear composite through use of canonical correlational analysis. The associations among individual items were also examined. The standard criterion of .3 was used to determine which individual items loaded on each canonical correlation.

Attitudes Toward Drinking

Item 34 was used to measure participants' personal, their friends, and others' attitudes toward drinking. This item lists 14 behaviors related to drinking and are asked to rate each behavior on a 3-point scale as "acceptable" (1), "don't care" (2), or "unacceptable" (3). These behaviors include the following: (a) drinking alcoholic beverages to be social, (b) giving parties where alcohol is served, (c) giving parties where the only drinks are alcoholic, (d) letting loose and having fun when drinking, (e) losing control when drinking, (f) drinking to get drunk, (g) being so drunk they throw up, (h)

drinking to fit in with a group, (k) providing alcohol to someone under the age of 21, (l) pressuring people to drink alcohol, (m) driving after two or three drinks, and (n) making sexual advances to someone who is high or drunk.

To obtain total scores for the personal, friends', and others' attitudes toward drinking, responses to the 14 items can be summed in a unit weighting fashion. This yields total scores that can potentially range from 14 (acceptable) to 42 (unacceptable), with higher scores being indicative of more conservative values. This scoring method is different from that employed by Hamid (1995), one of the first authors to use this scale to evaluate empirical questions. Instead of unit weighting each value, Hamid scored one point for each item respondents endorsed as either "acceptable" or "don't care". Using this method, scores ranged from 0 to 14 with higher values indicating more liberal attitudes toward drinking. However, one of the drawbacks of using this approach is that the range of responding is potentially restricted and such restricted ranges can reduce the magnitude of correlation coefficients (Tabachnick & Fidell, 1996). Thus, by using a unit weighting approach, it is less likely that this restriction of range problem will exist in the present study.

To examine the association among attitudes and actual drinking behaviors, the three dimensions will be combined into a linear composite through canonical correlational analysis.

Additionally, to further explore the associations among the items, the 14 items from each of the three dimensions will also be combined into a linear composite through canonical correlational analysis instead of relying solely on unit weighting.

Personal attitudes toward drinking. To evaluate respondents' personal attitudes toward drinking, participants are asked to respond to each of the 14 behaviors by endorsing the 3-point scale in response to the question, "Do you find this...." In the stem of this question, respondents are to provide their own opinion of the 14 behaviors. The coefficient alpha reported by Hamid (1995) for this index was .72. The large significant association between personal attitudes toward alcohol use and actual drinking behavior (r = .67) found by Hamid (1995) supports validity of this index.

Friends' attitudes toward drinking. To evaluate respondents' perceptions of their friends' attitudes toward drinking, participants are asked to respond to each of the 14 behaviors by endorsing the 3-point scale in response to the question, "Do your friends find this...." In the stem of this question, respondents are to provide an estimate of whether or not their friends find the 14 behaviors as acceptable or unacceptable. The survey defines friends for the respondent as being, "the people you see socially." Hamid (1995) reported the coefficient alpha for this index to be .76. Hamid also reported correlation between this index with actual drinking behavior as being r = .32 ($p < .001$), which supports the validity of this index.

Others' attitudes toward drinking. To evaluate respondents' perception of others' attitudes toward drinking, participants are asked to respond to each of the 14 behaviors by endorsing the 3-point scale in response to the question, "Do most students find this...." The stem of this question asks respondents to estimate the attitudes of most students as a whole. The coefficient alpha of this index has been reported as .73 (Hamid, 1995). The correlation of others' attitudes with actual drinking behavior has been reported as small, but statistically significant (r = -.19, $p < .01$) by Hamid (1995).

Drinking Norms

Items 31(a-b) and 32(a-b) were used to evaluate drinking norms. Item 31 measures drinking norms of the respondents' friends and 32 measures drinking norms of others. For each of these items, participants are asked to provide two ratings. The first rating asks them to estimate how many people (i.e., "friends" for item 31a and "other students" for item 32a) drink alcoholic beverages and how many people (i.e., "friends" for item 31b and "other students" for item 32b) drink to get drunk. Scale values range from 1 (none) to 4 (most). In the second rating, respondents are ask to endorse from 1 (less than once per month) to 7 (daily) the frequency with which friends (31a-b) or other students (32a-b) engaged in the given drinking patterns.

To obtain separate total drinking norm scores for friends and others, the rating for the number of people drinking will be multiplied by the frequency rating. Thus, the resulting product will provide four dependent variables of drinking norms that include: a) "friends'" drink alcoholic beverages.....how often?, b) "friends'" drink to get drunk.....how often?, c) "others'" drink alcoholic beverages.....how often? and d) "others'" drink to get drunk.....how often?. Higher values will be representative of norms which reflect a higher occurrence and severity of drinking among their friends and other students. Reliability indices are not available for this index. The validity of this index, however, is supported by the large statistically significant association found between this index and drinking behavior ($r = .51$, $p < .001$) reported by Hamid (1995).

Perceived Risk of Alcohol Use

Perceived risk of alcohol use was measured using items 33g, 33h, and 33i. The stem of all three of these items asks students to report on, "How much do you think

people risk harming themselves (physically or in other ways) if they...." The rating scale for this item ranges from 1 (no risk) to 5 (can't say), with a value of 4 indicating great risk. The differences between these three items are only in the frequency of alcohol usage that is portrayed. For instance, item 33g states, "Have one or two drinks nearly every day," item 33h states, "Have four or five drinks nearly every day," and item 33i states, "Have five or more drinks once or twice each weekend."

No reliability or validity estimates are provided for this index. For the purpose of testing the hypotheses in this study, scores of 5 were coded as 0 to eliminate the influence of the "can't say" option.

Consistent with the other scales, the three perceived risk items will be combined into a linear composite through canonical correlational analysis.

Procedures

The archival data collected from the survey was obtained from the administration at the University of Oklahoma. Procedures involved in the survey process will be briefly reviewed despite the fact that the present study did not involve the actual administration of the survey. After the course enrollment list for the randomly selected courses had been obtained from the university's administration, instructors were contacted and asked if they will allow the survey to be distributed in their class. Surveys were distributed at the beginning of class and then collected at the beginning of the next class two days later. Students participating in the survey were provided with a written description of the study, its purpose, and its relevance to drug and alcohol use on campus. Informed consent was assumed through the completion and return of the instrument. Participants were asked to only return the completed instrument with no identifying information added. With

informed consent being met by the returning of the materials, participants were guaranteed complete confidentiality.

Students were allowed to sign a piece of paper verifying their participation if they chose to. This allowed them the opportunity to receive credit from instructors who already give credit to student for research participation on campus. This list was only signed after the participant had turned in their instrument. At no time was this list and the survey stored together. This procedure guaranteed students' confidentiality, while allowing the instructor the flexibility of awarding credit for participation.

Data Analysis

The data collected from this investigation were analyzed using the Statistical Package for the Social Sciences (SPSS®). After the database had been verified for accuracy, descriptive statistics were first calculated. Because the hypotheses in this investigation focused on the association of drinking behavior among undergraduate college students with their attitudes toward drinking, drinking norms, and perceived risk of alcohol use, the hypotheses were analyzed using both canonical correlation analysis and by calculating bivariate Pearson product-moment correlations.

Canonical correlation analysis was chosen because it is appropriate for examining the relationship between two sets of variables (e.g., drinking behavior and attitudes towards drinking). Canonical variates that represented a linear combination of the items were created for each dimension examined for the hypotheses: (a) actual drinking behavior, (b) personal attitudes toward drinking (H1a), (c) friends' attitudes toward drinking (H1b), (d) others' attitudes toward drinking (H1c), (e) drinking norms (H2), and (f) perceived risk of alcohol use (H3). The significance of the canonical correlations

were evaluated using Wilks' Lamda criterion at a two-tailed .05 level of significance. Both the statistical significance and the sign (i.e., + or -) of the canonical and Pearson correlations were used to determine if the hypotheses were supported.

The assumptions underlying canonical correlation (i.e., linearity, homoscadasticity, and multivariate normality) were examined by visually inspecting the distribution of canonical variate scores and by producing a scatterplot of pairs of canonical variates (Tabachnick & Fidell, 1996). Inspection of these plots indicated that the data were sufficiently multivariate normal.

RESULTS

Preliminary Analyses

Before testing the hypotheses set forth in this investigation, descriptive statistics were calculated for the variables used in this study. Table 1 outlines all of the variables used in this study.

Insert Table 1 about here

Because there were 42 items representing the attitudes toward drinking, descriptive statistics for these variables are not summarized in a tabular format. All 42 items were missing data. The least amount of missing data was present on the personal attitudes about drinking item (34a.a) that asked the degree to which participants found drinking alcoholic beverages to be acceptable ($\underline{N}$ = 689, .14% missing cases). The most missing data occurred on the friends' attitudes toward drinking item (34b.d) that asked the degree to which participants found letting loose and having fun when drinking as being acceptable ($\underline{N}$ = 676; 2.02% missing cases). The pattern of missing data across all 42 items appeared to be random. Responses on all items ranged from 1 (acceptable) to 3 (unacceptable). Means ranged from a low of 1.24 (34a.e; self losing control when drinking) to a high of 2.80 (34a.m; self driving after 2-3 drinks) across all three attitudes toward drinking domains (i.e., personal, friends, and others). The standard deviations of these items ranged from a low of .42 (34b.a; friends drinking alcoholic beverages) to a

high of .81 (34a.f, self drinking to get drunk; 34a.l, self pressuring people to drink alcohol; 34b.c, friends giving parties where the only drinks are alcoholic).

Insert Table 2 about here

Table 2 summarizes the descriptive statistics for the actual drinking behavior, attitudes toward drinking, drinking norms, and perceived risks items. Missing data were also present on all actual drinking behavior and drinking norms items; no data were missing on the three items used to measure perceived risk. The number of cases missing ranged from a low of 1.6% cases on item 5a, which asked participants to report on the number of occasions that participants had to drink in a life time, to a high of 22.6% on item 12, which asked participants to report the average number of drinks they consumed each week. Despite the high propensity for individuals to not report the number of times they had 5 drinks or more and the average number of drinks they consumed per week, the distribution of missing data otherwise appeared random. Overall, the standard deviations of the items represented a reasonable degree of dispersion in each item, with the only exception being the somewhat restricted ranges on the risk items (i.e., 33g-i). However, in the worse case scenario (i.e., item 33h), the standard deviation was approximately 15% the size of the mean, indicating an acceptable degree of variability.

Because the proportion of individuals missing data on certain items was substantially high in this sample, mean substitution was not considered an appropriate method of dealing with the missing data. Instead, pairwise deletion was used in which cases were removed from any analysis if missing data were present on the pair of

variables that were being evaluated. Thus, this method preserved a large proportion of the data that could have otherwise been lost if other procedures were used (Roth, 1994). For this reason, however, sample sizes differ in most analyses.

Pearson correlations were next calculated among the items that were used to measure the actual drinking behaviors. These coefficients are shown in Table 3. As can be seen, all coefficients exceeded .33 and were statistically significant at $p < .001$. The mean correlation was .64, which represents a large correlation (Cohen, 1988), indicating that the items comprising actual drinking behavior were highly related with each other.

Insert Table 3 about here

Correlations among the drinking norms and among the perceived risk items were also calculated and are presented in Table 4. The four drinking norms items were all significantly correlated with each other with coefficients ranging from low ($r = .10$) to large ($r = .67$). The three risk items were all significantly correlated with each other with coefficients ranging from low ($r = .15$) to large ($r = .42$). The pattern of significant associations among the three sets of items (i.e., drinking behavior, drinking norms, and perceived risk) indicated that they were appropriate to combine into linear composites.

Insert Table 4 about here

Hypothesis Testing

This investigation proposed three hypotheses. The testing of these hypotheses was conducted through canonical correlation analyses in which the set of items representing actual drinking behavior were correlated with sets of items that represented attitudes toward drinking (H1), drinking norms (H2), and perceived risk of alcohol use (H3). Table 5 outlines each canonical correlational analysis and results for each hypothesis are presented in this section.

Insert Table 5 about here

Hypothesis 1: Actual Drinking Behavior and Attitudes Toward Drinking

The first hypothesis predicted that attitudes toward drinking would be positively related with actual drinking behavior, (i.e., the higher the reported quantity and frequency of alcohol use, the more acceptable attitudes will be toward alcohol use and associated behaviors). In particular, it was expected that three sets of attitudes would be positively correlated with actual drinking behavior: (a) personal attitudes toward drinking (H1a), (b) perception of friends' attitudes toward drinking (H1b), and (c) perceptions of others' attitudes toward drinking(H1c). Participants' responses to item 34, which asked participants to report how acceptable vs. unacceptable they found 14 specific behaviors to be, were used to examine each of these domains.

To test the general hypothesis that attitudes are related to drinking behaviors, a canonical correlation was calculated between the set of actual drinking behavior items and the three dimensions of attitudes toward drinking. Four hundred and eight five cases

were accepted for this analysis and 205 cases were rejected because of missing data. This analysis resulted in the variance in the items being accounted for by three canonical correlations (CC). The first canonical correlation was .60 (36% shared variance). The remaining two CC were less than .16 and nonsignificant. Statistical significance occurred when all CC were included, Wilks' $\Lambda = .62$, $F(24, 1375.35) = 10.14$, $p < .001$, and when the first CC was removed, $\Lambda = .96$, $F(14, 950.00) = 1.07$, $p < .39$. Thus, the first pair of canonical variates accounted for the significant relationships between the two sets of variables. When examining the significant CC to identify the significantly contributing variables, all 8 of the drinking variables ($r = .60$ to .90) and two of the three attitude variables (Personal attitudes, Friends' attitudes) loaded on the significant CC. This analysis provides support for the hypothesis that overall attitudes toward drinking are positively related to actual drinking behavior. Even more, it indicates that personal attitudes ($r = -.97$) and perception of friends' attitudes ($r = -.48$) provide the most weight to this relationship.

To further explore the associations among the items, the 14 items from each of the three dimensions (Personal, Friends,' and Others') will also be combined into a linear composite through CC analysis with actual drinking behavior. This allows us to examine the more specific hypotheses (H1a, H1b, H1c). For H1a, Four hundred and ninety four cases were accepted for this analysis and 196 cases were rejected because of missing data. This analysis resulted in the variance in the items being accounted for by eight CC. The first CC was .65 (42% shared variance), the second was .40 (16% shared variance) and the third was .32 (10% shared variance). The remaining five CC were less than .26 and nonsignificant. Statistical significance occurred when all CC were included, Wilks'

$\Lambda = .38$, $F(112, 3321.56) = 4.34$, $p < .001$, when the first CC was removed, $\Lambda = .66$, $F(91, 2957.03) = 2.26$, $p < .001$ and when the second CC was removed, $\Lambda = .78$, $F(72, 2584.64) = 1.64$, $p < .01$. Thus, the first three pairs of canonical variates accounted for the significant relationships between the two sets of variables. More specifically, all 8 of the drinking variables ($r = -.65$ to $-.94$) and all but two of the personal attitude items (J-"drinking to fit in with a group" and L-"pressuring people to drink alcohol") loaded ($r = .38$ to $.81$) on the first and most significant CC. Attitude items J and L did load on the least significant, third CC. This analysis provides support for the hypothesis that personal attitudes toward drinking are positively related to actual drinking behavior. Even more, it indicates that all but two (J and L) of the personal attitude items and actual drinking behavior items are important to this relationship.

H1b predicted that the perception of friends' attitudes toward drinking would be positively related with actual drinking behaviors. As was done in the previous analysis, H1b was tested by conducting a canonical correlation between the set of actual drinking behavior items and the set of 14 friends' attitudes toward drinking items. Four hundred and eighty five cases were accepted for this analysis and 205 cases were rejected due to having missing data. As with the previous analysis, the present analysis resulted in the retention of two CCs. The first CC was .48 (23% shared variance) and the second was .35 (12% shared variance). The remaining six CC were less than .08 and nonsignificant. Statistical significance occurred when all CC were included, Wilks' $\Lambda = .55$, $F(112, 3258.45) = 2.54$, $p < .001$, when the first CC was removed, $\Lambda = .73$, $F(91, 2900.93) = 1.68$, $p < .001$. Thus, the first two pairs of canonical variates accounted for the significant relationships between the two sets of variables. More specifically, all 8 of the

drinking variables (r = .69 to .93) and all but three of the friends' attitude items (I-"drinking to get away from troubles," J-"drinking to fit in with a group and L-"pressuring people to drink alcohol") loaded (r = -.30 to -.65) on the first and most significant CC. The attitude item L did load on the second CC. This analysis provides support for the hypothesis that friends' attitudes toward drinking are positively related to actual drinking behavior. Even more, it indicates that all but two (I and J) of the attitude items and actual drinking behavior items are important to this relationship.

H1c predicted that perceptions of others' attitudes toward drinking would be positively related with actual drinking behaviors. A CC was again conducted using the set of actual drinking behavior items and the set of 14 others' attitudes toward drinking items. Four hundred and eighty five cases were accepted for this analysis and 205 cases were rejected due to having missing data. This analysis also resulted in eight canonical correlations and only the first CC (.33; 11% shared variance) was statistically significant in that statistical significance occurred when all CC were included, Wilks' Λ = .71, $F(112, 3258.45) = 1.40$, $p < .001$, but disappeared when the first CC was removed, Λ = .80, $F(91, 2900.93) = .1.10$, $p = .25$. The remaining seven CC were less than .25 and nonsignificant. Thus, the first pair of canonical variates accounted for the significant relationships between the two sets of variables. More specifically, all but 3 of the 8 drinking items (5b-" Occasions to drink...during last 12m", 11-" Over last 2 wks, times had 5+ drinks" and 12-" Average number of drinks per week") and 8 of the others' attitude items (E through N: See Table 1) loaded on the significant CC. Initially, this analysis appears to provide support for the hypothesis that others' attitudes toward drinking are positively related to actual drinking behavior. However, upon closer

examination of the eight significant attitude items, (r = -.30 to -.67), and five significant actual drinking behavior items, (r = -.31 to -.61), we see that their relationship is opposite than first hypothesized. In other words, this analysis indicates that the perception others' attitudes toward drinking are negatively related to actual drinking behavior (i.e., the more conservative one perceives "others'" attitudes are toward alcohol use and associated behaviors, the higher the quantity and frequency of alcohol use reported).

Hypothesis 2: Actual Drinking Behavior and Drinking Norms

The second hypothesis predicted that participants' perceptions of drinking norms would be positively related to actual drinking behaviors. To test this hypothesis, a canonical correlation was calculated between the set of actual drinking behavior items and the set of four drinking norms items (31a-b, 32a-b). Three hundred and eighty four cases were accepted for this analysis; three hundred and six cases were rejected because of missing data. This analysis resulted in the variance in the items being accounted for by four canonical correlations (CC). The first CC was .55 (30% shared variance), the second was .29 (9% shared variance) and the third was .22 (5% shared variance). Statistical significance occurred when all CC were included, Wilks' Λ = .60, F(32, 1373.46) = 6.27, p < .001, when the first CC was removed, Λ = .86, F(21, 1071.60) = 2.65, p < .001, when the second CC was removed, Λ = .95, F(12, 748.00) = 1.77, p < .05, and when the third CC was removed, Λ = .99, F(5, 375.00) = .6, p < .73. Thus, the first three pairs of canonical variates accounted for the significant relationships between the two sets of variables. More specifically, all 8 of the drinking variables loaded on the first and most significant CC (r = -.54 to -.94) and only the "friends'" items loaded on both the first and the second CC (31a's r = -.83 and 31b's r = -.91). The "others'" items did load

on the third CC (r = .96 and .59), however, as with attitudes their relationship to the CC were the opposite than what was predicted. This analysis provides support for the hypothesis that the perception of friends' drinking norms are positively related to actual drinking behavior, but does not support the similar hypothesis as it relates to perception of others' drinking norms. More specifically, this second hypothesis also predicted actual drinking behaviors would be more closely related to the perceptual norms of friends' drinking levels than the perceptual norms of others' drinking levels (H2c). Although this hypothesis is supported by the above CC, Pearson correlations were calculated between the items used to measure actual drinking behavior and the drinking norms variables (see Table 6), to more closely examine these predictions. As can be seen, all items that measured actual drinking behavior were significantly and positively associated with the friends' drinking norm items. However, only item 12 was significantly and positively correlated with the others' drinking norm items.

Insert Table 6 about here

Hypothesis 3: Actual Drinking Behavior and Perceived Risk

The third hypothesis in this investigation predicted that perceived risk of alcohol use would be significantly related to actual drinking behaviors. This hypothesis was also tested by way of canonical correlation in which the set of actual drinking behavior items was correlated with the set of three perceived risk of drinking items. Five hundred and ten cases were accepted for this analysis and 180 cases were rejected because of missing data. Three canonical correlations were derived from this analysis. The first canonical

correlation was .54 (29% shared variance). The remaining two CC were less than .12 and nonsignificant. Statistical significance occurred when all three canonical correlations were included, Wilks' $\Lambda = .69$, $F(24, 1447.85) = 7.93$, $p < .001$. However, when the first canonical correlation was removed, statistical significance was no longer present, $\Lambda = .98$, $F(14, 1000) = .76$, $p = .71$. Thus, the first pair of canonical variates accounted for the significant relationship between the two sets of variables. More specifically, all 8 of the drinking items ($r = -.59$ to $-.90$) and all three of the perceived risk items ($r = .45$ to .97) loaded on the significant CC.

Furthermore, inspection of the zero-order correlations between the drinking behavior and perceived risk items (see Table 6) revealed statistically significant inverse associations for all variable pairs. Although the associations for items 33g and 33h were mostly small in magnitude, stronger associations were found with item 33i. The statistically significant canonical correlation, along with the consistent pattern of significant bivariate associations, provide support for the third hypothesis and indicate that perceived risk is inversely related to actual drinking behavior.

DISCUSSION

Overview of the Study

The present investigation sought to provide a comprehensive assessment of substance use of the undergraduate population at the University of Oklahoma campus by not only assessing the amount of use itself, but by examining how actual drinking behavior among undergraduates is related to attitudes toward alcohol use, perceived drinking norms, and the students' perceived risks of using alcohol. In examining these associations, this study sought to provide support for Ajzen and Fishbein's (1977) theory of reasoned action.

The data from the randomly selected sample of 690 University of Oklahoma undergraduate students examined in this study were obtained from the Use of Alcohol, Tobacco, and Other Drugs in the Community Survey, which was developed by University of Michigan's Initiative on Alcohol and Other Drugs (Hamid, 1995).

Summary of the Findings

Findings on Attitudes Toward Drinking

Most of the predictions of this investigation were supported. The first thing that this study examined was the extent to which actual drinking behavior would be positively related with accepting attitudes toward alcohol use. As was predicted, drinking behavior was found to have a large association with attitudes toward drinking (canonical $r = .60$). In particular, the higher the quantity and frequency of alcohol use that students reported, the more acceptable their personal attitudes were toward alcohol use and associated behaviors, such as drinking to get drunk and pressuring people to drink alcohol

(canonical $\underline{r}$ = .65). Additionally, the more that students reported drinking, the more acceptable they perceived their friends' attitudes toward the use of alcohol (canonical $\underline{r}$ = .48). In terms of attitudes, one finding was quite surprising. In contrast to the two previous attitude constructs, the more students reported drinking, the "less" acceptable they perceived others' attitudes toward the use of alcohol (canonical $\underline{r}$ = .33).

These findings are consistent with previous research, such as that by Banks and Smith (1980), Mills and McCarty (1983), Ratliff and Burkart (1984), and Hamid (1995). These results provide further evidence of the significant association between actual drinking behavior and attitudes toward drinking, the magnitude of the associations are also similar to those reported by Hamid (1995), who also examined a college population using the same instrument that was used in the present study.

In his 1995 investigation, Hamid reported a correlation of $\underline{r}$ = .67 for the association between actual drinking behavior and personal attitudes while the present investigation found the same large association between these dimensions (canonical $\underline{r}$ = .65). The magnitude of the associations between drinking behavior and personal attitudes could be considered relatively large given that these two aspects share 42% of their variance in common.

The magnitude of the associations is particularly noticeable when examining the relationship between drinking behavior and friends' attitudes toward drinking. In his study, Hamid reported a moderate size correlation between these constructs ($\underline{r}$ = .32) whereas a much stronger association was found in the current study (canonical $\underline{r}$ = .48). In other words, the present study found over two times the shared variance (i.e., 23% vs.

10%) between these constructs when using the exact same measure to examine the associations.

This investigation, as found in Hamid (1995), also found a significant association between students' drinking behavior and their perception of others' attitudes toward drinking. Furthermore, like Hamid (r = -.19), this investigation found an inverse association between these constructs. This association indicates that although a relationship between drinking behavior and others' attitudes is present, it is much less than personal and friends' attitudes and is inverse in nature.

Outside of the perception on others' attitudes—increased drinking behavior is associated with more accepting attitudes toward drinking. That is, these results are congruent with the theory of reasoned action that predicts that attitudes, as well as norms, to predict behavioral intentions. The findings that pertain to norms regarding drinking further support this theory.

Findings on Drinking Norms

This study also predicted that students' perceptions of drinking norms would be positively associated with their actual drinking behavior. Consistent with Hamid's (1995) findings, the present investigation found support for this contention. That is, students' personal use of alcohol was found to increase the more liberal their perceptual norms were about the consumption of alcohol. The association found in this study was commensurate (canonical r = .55) with results reported by Hamid (r = .51). More interesting than this general finding, however, was the observation that personal use of alcohol was only associated with the perceived norms of friends' alcohol use, but not with the perceived norms of others' alcohol use.

Although there was support for friends' drinking norms being moderately associated with actual drinking behaviors, drinking norms of others mostly had no association at all to the drinking behavior of participants. These associations were nearly zero. Thus, in this study the more that students reported using alcohol, the higher they perceived their friends' use of alcohol, yet their drinking behavior was independent of the drinking norms of other adults. Overall, this finding is consistent with the research of Baer et al. (1991) who found that drinking behavior was more strongly associated with drinking norms of friends than to drinking norms of others.

In sum, the fact that norms were a significant predictor of actual drinking behavior provides further support for the theory of reasoned action. This is consistent with the propositions set forth by Laflin et al. (1994). However, despite the fact that the findings from this study support the theory of reasoned action, this theory alone cannot explain all of the findings, particularly those pertaining to the role of students' perception of perceived risk of harm from using alcohol.

Findings on Perceived Risk of Alcohol Use

This study also examined students' perceived risk of using alcohol and predicted that it would be significantly related to their actual drinking behavior. The data from this study supported this contention in that these two constructs were strongly associated (canonical $\underline{r} = -.53$). That is, the more students reported using alcohol, the less they perceived there was a risk of harming themselves as the result of using alcohol. These results provide support for the argument that perceived risks are low among people engaging in high-risk behaviors, a position proposed by the Health Belief Model.

The findings from this study support the work by Backman (1988) who also found that perceived risk was a strong predictor of alcohol use. Despite the widespread use of alcohol in the United States, the risk of harm by using alcohol appears to be a clear factor that is related to actual use. It may be that educational campaigns in the last decade have increased student awareness of the negative consequences of alcohol consumption thereby perhaps contributing to decreased alcohol use among those who understand the negative consequences of alcohol consumption.

The data from this study clearly indicate that perceived risk is a crucial variable in predicting college students' alcohol use. Despite the desire to interpret causally this association, all that is presently known is that alcohol use and perceived risk of harm of alcohol use are strongly inversely related. Only well-controlled experimental designs will be able to determine if perception of risk is causally related to alcohol use.

The results from this investigation, as well as others whose results this study supports (e.g., Hamin, 1995; Mills & McCarty, 1983), can readily be used to not only design prevention and intervention programs, but to also identify individuals who are at risk for alcohol abuse and alcohol-related problems. The data from this study revealed that the students in this sample, on average, consumed a little less than 6 drinks per week. Approximately 75% of the students consumed between 0-7 drinks per week; and, only 12% reported having 0 drinks per week. This translates into over a quarter of the student body reported drinking, on average, more than a drink a day. There was, however, tremendous variability in the number of drinks consumed with students ranging from having 0-75 drinks per week. This level of alcohol consumption by the student body appears high, but is in line with what other researchers have reported. For example, at

Louisiana State University, Grenier (1993) found that 37% of the students drank once or twice a week. In the present study, 40% of the students reported drinking once or twice a week.

Nevertheless, these results indicate that not only is there a need for alcohol prevention and intervention program at the University of Oklahoma, but that the inclusion of attitudes toward alcohol use, perceived drinking norms of friends,' and perceived risk of using alcohol are all important variables to include in any such program. Because the results from this study strongly support the theory of reasoned action and portions of the Health Beliefs Model, any program designed by the University of Oklahoma should integrate these theories.

Implications

Prevention and Intervention Programs

The data gathered in this investigation can have great bearing upon designing appropriate alcohol prevention and intervention programs. By understanding the correlates of actual drinking behaviors, the university can be in a position to better intervene in an effective way that is sensitive to the attitudes and belief systems of the student population. This study provides firm support for being aware of students' attitudes toward drinking, the drinking norms of their friends, and their perceived risk of using alcohol. All three of these factors appear to be strongly associated with students' drinking behavior. More specifically, the results from this study suggest that as a university designs and implements a (university) community based alcohol prevention program, campaigns and interventions should focus on influencing attitudes, perceived use by friends and perceived risk of using alcohol. These results also suggest a

prevention/intervention program will have more impact if the recipients believe the groups presenting the information are friends. If the community perceives the message of change is coming from "others," (e.g. administration, law enforcement, health professional, etc...) the result of this study suggest there will be no impact. Task forces and committees set-up to address alcohol use on campus needs to include students representing different university populations.

The findings in this study also indicate the potential for identifying individuals and groups who are "at risk" of developing irresponsible and/or heavy alcohol use as they begin to integrate into the university community. The design of a brief questionnaire which focuses on identifying an individual's reported alcohol use, their attitudes toward alcohol, perceived use of alcohol by friends and the perceived risk of using alcohol, would be useful in providing the early identification and intervention.

Limitations of the Study

The most important limitation of this study is the ability to generalize the results to individuals who have become dependent on alcohol. The data collected from this study does not directly examine the problem of alcohol dependency. Although the majority of the alcohol related problems in the university community are associated with recreational use, heavy drink and alcohol dependency are still present (Rabow & Newman, 1984; Berkowitz & Perkings, 1986; Globetti et.al., 1988). Intervention in alcohol dependency requires the examination of much more in-depth theories of behavioral change. One in particular is the Stages of Change Model, which is much more appropriate for examining the development and treatment of alcohol dependency, than the theory of reasoned action or the portions of the health belief model examined above.

The findings from this investigation must also be interpreted in light of the research limitations inherent in the study. The first limitation of this study surrounds the use of a self-report measure. Although this investigation assumed that participants would be honest in their reports of substance use, there is no guarantee that they were. There also exists the possibility that participants were not forthright in their reports of substance abuse, there are several factors that would suggest that socially desirable reporting was not a substantial issue in the present investigation. Research in the area of social desirability demonstrates that ensuring anonymity, as was employed in the present investigation, substantially reduces the influence of socially desirable responding (Paulhus, 1991). The fact that individuals in the present study were aware that their responses were anonymous likely reduced any tendency for them to report in a socially appropriate manner. Additionally, there is also evidence to suggest that social desirable responding decreases when a time deadline is not enforced (Paulhus, 1991). Because individuals in this study could complete the survey at their own pace with no time restrictions, it is likely that this also reduced the tendency to underreport their substance use.

This investigation also asked participants to estimate the drinking behaviors of their friends. The accuracy of these judgments, and whom they refer to as friends, must largely remain unknown. The assumption is that individuals will be able to accurately report on the behavior of others. Although this is a possible drawback of this investigation, there is some research which suggests that, while observer reports of attitudes are generally not accurate, reports of observable behavior, such as drinking, generally are (Paulhus, 1991). Nevertheless, when interpreting these findings it is

important to consider that the responses represent participants' perceptions of the areas being measured—not objective reality.

Furthermore, the data collected from this investigation is purely correlational in nature and therefore does not allow for the inference of causality. However, if significant associations are not observed as expected this would nevertheless indicate that no causal association is present. That is, underlying all causal associations are significant associations (Campbell & Stanley, 1963). Yet, if a significant association does exist as predicted, then it is possible, but not definitive that this association is causal in nature. Additionally, despite not being able to draw causal inferences, there is still practical utility in being aware of significant relationships among the variables of interest.

Another issue that must be addressed is that of missing data. In some instances up to 20% of the data were missing from any one analysis; and, the chosen pairwise deletion method of dealing with the missing data led to some students being included in some analyses but not others. Although there is the possibility that these differential sample sizes created differing results, it likely did not simply for the reason that in many analyses the sample sizes did not differ tremendously. The largest concern with missing data is that of a decrease in statistical power (Roth, 1994). This is the main reason why a listwise deletion procedure was not used—it would have decreased the sample size substantially more than was already done by use of the pairwise deletion methodology. Testimony to the fact that statistical power was not adversely affected in this study is the observation that many correlation coefficients that were small in magnitude were nevertheless statistically significant. Because of the large sample size used in this study, this study could afford such a tremendous loss of data.

The second issue that relates to missing data is the tendency for it to lead to a downward bias of correlation coefficients, which results from a restriction of variance on the variables. However, the variance estimates in the present study were not representative of overly restricted ranges. One issue that is not known, however, is the extent to which the central tendency estimates (e.g., the mean) were biased either downward or upward. There is a possibility that some of the scores may be over or under inflated, but the large sample size hopefully would have substantially reduced the magnitude of these shifts.

The last limitation that must be mentioned is the self-selection bias that is inherent in any survey study. This study represented just under 70% of the 1,000 students who were randomly selected to be administered the survey. Although this represents a respectable return rate, the characteristics of those who did not respond remain unknown. It is possible that the 30% who did not respond are characteristically different from those who did and therefore the data from this study do not represent this subgroup.

Directions for Future Research

This study was one of many that have provided evidence for the theory of reasoned action. However, testing this theory on drug and alcohol behaviors has not been widely conducted on college populations and therefore replication of the results of the present study is one avenue for future research. In addition, however, other variables should be examined, such as those identified in the Health Belief Model (HBM). Although the theory of reasoned action has application in a college population, we know very little about how the HBM applies to predicting and preventing alcohol use among college students. Thus, a clear direction for future research is to conduct studies on the

various models that have been proposed for predicting health-related behaviors, such as alcohol consumption.

Future researchers will also want to analyze more carefully the characteristics of participants to determine if there are any subgroups who are at higher risk for alcohol-related problems than others. Identification of subsets of the student population should be of primary concern among researchers in that such efforts would greatly assist in prevention and intervention efforts.

Additionally, outcome research will need to be done to examine the effectiveness of various prevention and intervention programs implemented by universities. By providing a firm empirical grasp of the variables that relate to drinking among college student, better programs can be designed. However, it is only when these intervention programs are examined empirically will we truly know if the theories that are otherwise supported are applicable to the college population.

This study examined the role of perceived risk of harm from alcohol use in a college population. The observation that this variable played a large role in contributing to actual alcohol use clearly indicates that perceptions of risk are worthy of consideration in most studies on alcohol use. Although the present study helped to clarify the role of perceived risk, future researchers should attempt to see if, and how, perceptions of risk can be overridden, as was found by Rhodes and Cosby (1990) in a non-student sample. It is only through additional research that we will gain the knowledge to effectively intervene.

Lastly, as with the majority of other studies examining the role of alcohol on the university campus, this study touch upon, but did not address the issue of alcohol

dependency (or alcoholism). Future research should also address the characteristics of individuals that become dependent on alcohol, as well as, examine the treatment methods that work best with the university population. It is this area the Stages of Change Model might be utilized to examine and develop effective approaches to treating alcohol dependency on university campuses.

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APPENDICES

APPENDIX A

TABLES

Table 1

Outline of Items used in Data Analysis

Actual Drinking Behavior

Four items on the survey were used to assess participants' actual drinking behavior, the main dependent variable for this study: (a) item 5a-c, (b) item 9a-c, (c) item 11, and (d) item 12.

- 5a: Occasions to drink...in your lifetime
- 5b: Occasions to drink...during last 12m
- 5c: Occasions to drink...during last 30 days
- 9a: How many occasions drunk in lifetime
- 9b: How many occasions drunk last 12m
- 9c: How many occasions drunk last 30 days
- 11: Over last 2 wks, times had 5+ drinks
- 12: Average number of drinks per week

Attitudes

Item 34 was used to measure participants' personal, their friends, and others' attitudes toward drinking.

By Construct

- (a) Personal Attitudes (Peratt)
- (b) Friends' Attitudes (Frieatt)
- (c) Others' Attitudes (Otheratt)

By Item

- (a) drinking alcoholic beverages to be social
- (b) giving parties where alcohol is served
- (c) giving parties where the only drinks are alcoholic
- (d) letting loose and having fun when drinking
- (e) losing control when drinking
- (f) drinking to get drunk
- (g) being so drunk they throw up
- (h) getting loud and aggressive when drinking
- (i) drinking to get away from troubles
- (j) drinking to fit in with a group
- (k) providing alcohol to someone under the age of 21
- (l) pressuring people to drink alcohol
- (m) driving after two or three drinks
- (n) making sexual advances to someone who is high or drunk.

Norms

Items 31(a-b) measures drinking norms of the respondents' friends

31 - How many of your friends:

- (a) drink alcoholic beverages
- (b) drink to get drunk.

Items 32(a-b) were used to evaluate drinking norms of others

32 - How many adults:

- (a) drink alcoholic beverages
- (b) drink to get drunk.

Perceived Risk

- 33g: Have one or two drinks nearly every day
- 33h: Have four or five drinks nearly every day
- 33i: Have five or more drinks once or twice each weekend

Table 2

Descriptive Statistics on Items Used to Measure Actual Drinking Behavior, Drinking Norms, and Perceived Risk of Drinking

Items	N	Mean	SD	Min	Max
Actual Drinking Behavior					
5a: Occasions to drink... in your lifetime	679	5.5	1.97	1	7
5b: Occasions to drink... during last 12m	676	4.46	2.09	1	7
5c: Occasions to drink... during last 30 days	675	2.63	1.53	1	7
9a: How many occasions drunk in lifetime	629	4.27	2.21	1	7
9b: How many occasions drunk last 12m	618	3.17	1.99	1	7
9c: How many occasions drunk last 30 days	538	1.89	1.2	1	7
11: Over last 2 wks, times had 5+ drinks	538	2.06	1.2	1	5
12: Average number of drinks per week	534	5.68	8.41	0	75
Attitudes Toward Drinking					
34a: Personal Attitudes	669	25.28	5.03	14	42
34b: Friends' Attitudes	676	35.93	4.63	14	42
34c: Others' Attitudes	675	35.40	4.97	14	42
Drinking Norms					
31a: Perceived norms of friends' drinking	620	14.55	5.75	1	28
31b: Perceived norms of friends' intoxication	578	10.44	5.88	1	28
32a: Perceived norms of others' drinking	604	11.74	5.99	1	28
32b: Perceived norms of others' intoxication	527	5.44	4.37	1	28
Perceived Risk					
33g: Risk harming themselves... have 1-2 drinks nearly every day	690	3.05	.91	1	5
33h: Risk harming themselves... have 4-5 drinks nearly every day	690	3.76	.58	1	5
33i: Risk harming themselves... have 5+ drinks nearly each weekend	690	3.15	.91	1	5

Table 3

Pearson Correlations Among Actual Drinking Behavior Items

Item	5a	5b	5c	9a	9b	9c	11	12
5a	--							
5b	.82 ***	--						
5c	.61 ***	.81 ***	--					
9a	.77 ***	.71 ***	.58 ***	--				
9b	.57 ***	.77 ***	.68 ***	.82 ***	--			
9c	.39 ***	.59 ***	.73 ***	.61 ***	.80 ***	--		
11	.41 ***	.62 ***	.71 ***	.61 ***	.75 ***	.79 ***	--	
12	.33 ***	.51 ***	.58 ***	.50 ***	.62 ***	.67 ***	.69 ***	--

Note. N < 690 in most pairs due to missing data. *** p < .001.

Table 4

Pearson Correlations Among Drinking Norms and Perceived Risk Items

	Drinking Norms				Perceived Risk		
Items	31a	31b	32a	32b	33g	33h	33i
31a	--						
31b	.67 ***	--					
32a	.26 ***	.15 ***	--				
32b	.10 *	.21 ***	.42 ***	--			
33g					--		
33h					.15 ***	--	
33i					.21 ***	.42 ***	--

Note. N < 690 in most pairs due to missing data. * p < .05. *** p < .001.

Table 5

Canonical Correlational Analysis with Variable Items/Constructs Loading on the 1st CC

Attitude, Norm, Risk Variables		Actual Drinking Behavior	
Canonical Correlation (First Sign. CC only)		Shared Variance	
H1abc (+ relationship)	↓	↓	
Attitudes (1 Sig. Canonical Variate)	.60	36%	$p < .001$
Loaded: 2 of 3 constructs (Peratt, Frienatt) Did not load: Otheratt		All 8 Drinking Variables	
H1a (+ relationship)			
• Personal (3 Sig. Canonical Variates)	.65	42%	$p < .001$
Loaded: 12 of 14 items Did not load: J, L - (Both items did load on the 3rd CC)		All 8 Drinking Variables	
H1b (+ relationship)			
• Friends' (2 Sig. Canonical Variates)	.48	23%	$p < .001$
Loaded: 11 of 14 items Did not load: I, J, L - ("L" did load on the 2nd CC)		All 8 Drinking Variables	
H1c (- relationship)			
• Others' (1 Sig. Canonical Variate)	.33	11%	$p < .005$
Loaded: 8 of 14 items (opp. direction than anticipated) Did not load: A through F		Loaded: 5 of 8 items Did not load: 5b, 11, 12	
H2abc (+ relationship)			
Norms (3 Sig. Canonical Variate)	.55	30%	$p < .001$
Loaded: Friends' items (31a-b) Did not load: Others' items (32a-b)		All 8 Drinking Variables	
H3 (- relationship)			
Perceived Risk (1 Sig. Canonical Variate)	.53	28%	$p < .001$
Loaded: 33g, 33h, 33i		All 8 Drinking Variables	

Table 6

Pearson Correlations of Drinking Behavior Items with Drinking Norms and Perceived Risk

Drinking Behaviors	Drinking Norms				Perceived Risk		
	31a	31b	32a	32b	33g	33h	33i
5a	.33 ***	.18 ***	-.20	-.05	-.21 ***	-.15 ***	-.38 ***
5b	.44 ***	.29 ***	.03	-.08	-.27 ***	-.23 ***	-.50 ***
5c	.41 ***	.34 ***	.08	-.02	-.30 ***	-.25 ***	-.48 ***
9a	.41 ***	.36 ***	.04	-.03	-.23 ***	-.20 ***	-.43 ***
9b	.45 ***	.46 ***	.06	-.04	-.26 ***	-.24 ***	-.50 ***
9c	.37 ***	.43 ***	.07	-.02	-.22 ***	-.22 ***	-.41 ***
11	.41 ***	.43 ***	.08	-.00	-.24 ***	-.23 ***	-.45 ***
12	.34 ***	.35 ***	.15 ***	-.04	-.22 ***	-.19 ***	-.34 ***

Note. N < 690 in most pairs due to missing data. *** p < .001.

APPENDIX B

USE OF ALCOHOL, TOBACCO, AND OTHER DRUGS IN THE UNIVERSITY COMMUNITY SURVEY (FORM S)

(Form S)

SURVEY ON THE USE OF ALCOHOL, TOBACCO, AND OTHER DRUGS IN THE UNIVERSITY COMMUNITY

This Survey is intended to be completely "ANONYMOUS." Your security is our first priority. Please do not write any identifying information on this booklet!!

USE OF ALCOHOL, TOBACCO, AND OTHER DRUGS IN THE UNIVERSITY COMMUNITY

FORM S

This survey is anonymous. Do not record your name or any identifying information on the survey. You are welcome to write comments on the back page, or in the margins.

Please circle the answer or put an X in the box that best describes your situation or position.

EXAMPLES:

A. Do you believe that cigarettes should be sold to people under the age of 18 years?

1. YES
2. NO

B. How many years have you been at the University of Oklahoma?

<1 | 1-2 | 3-6 | 6-9 | 10+

☐ ☐ ☐ ☐ ☐

THE FIRST QUESTIONS HAVE TO DO WITH TOBACCO USE

1. How frequently have you smoked cigarettes during the **past 30 days**?
   1. Not at all
   2. Less than one cigarette per day
   3. One to five cigarettes per day
   4. About one-half pack per day
   5. About one pack per day
   6. About one and one-half packs per day
   7. Two packs or more per day

2. How frequently have you used a cigar or pipe in the **past 30 days**?
   1. Not at all
   2. Once or twice
   3. Occasionally
   4. Several times a week
   5. Everyday

3. How frequently have you used smokeless tobacco (chew, snuff) in the **past 30 days**?
   1. No
   2. Yes, occasionally
   3. Yes, daily

THE NEXT QUESTIONS ARE ABOUT DRINKING ALCOHOL (INCLUDING BEER, WINE, WINE COOLERS, OR LIQUOR)

4. At parties or social events, what is the beverage you most often prefer?
   1. Beer
   2. Wine
   3. Wine Coolers
   4. Liquor/mixed drink
   5. Liqueur
   6. Coffee tea
   7. Soft-drink, non-alcoholic

5. On how many occasions (if any) have you had alcoholic beverages to drink...

# occasions:	0 (1)	1-2 (2)	3-5 (3)	6-9 (4)	10-19 (5)	20-39 (6)	40+ (7)
a....in your lifetime?	☐	☐	☐	☐	☐	☐	☐
b....during the last 12 mths?	☐	☐	☐	☐	☐	☐	☐
c....in the last 30 days?	☐	☐	☐	☐	☐	☐	☐

6. Did spring break occur in the last 30 days?
   1. YES ↓
   2. NO

   6a. During spring break, did your drinking level
   1. Increase 2. Decrease 3. Stay the same

7. How would you describe your current use of alcohol?
   1. Abstainer
   2. Occasional drinker
   3. Light drinker
   4. Moderate drinker
   5. Heavy drinker

8. Had you ever tried alcohol before coming to the University of Oklahoma?
   1. Yes, drank when I came
   2. Tried it, but stopped before comings
   3. No, never tried alcohol

IF YOU NEVER DRANK ALCOHOL, SKIP TO PAGE 3, Q. 21

9. On how many occasions (if any) have you been drunk or extremely high from drinking alcoholic beverages?

# occasions:	0 (1)	1-2 (2)	3-5 (3)	6-9 (4)	10-19 (5)	20-39 (6)	40+ (7)
a....in your lifetime?	☐	☐	☐	☐	☐	☐	☐
b....during the last 12 mths?	☐	☐	☐	☐	☐	☐	☐
c....in the last 30 days?	☐	☐	☐	☐	☐	☐	☐

10. Did you ever deliberately try to decrease your use of alcohol?
    1. YES ↓
    2. NO

    10a. Why did you do this? (circle all that apply)
    1. To improve or maintain health or fitness
    2. To reduce hangovers, blackouts, or other effects
    3. Thought I was or might become addicted.
    4. Drinking took too much time or cost too much.
    5. Someone I care about disapproved of my drinking
    6. It was against my values.
    7. It interfered with achieving my goals
    8. I got involved in other activities.
    9. Trouble with the legal system or on the job.
    10. Family commitments changed
    11. Pregnancy
    12. Other _____

    10b. What did you do? (circle all that apply)
    1. Spent less time where people drink
    2. Just reduce my own consumption
    3. Went to treatment or AA

    10c. Where you successful in decreasing your usual amount of alcohol?
    1. Yes, permanently 2. Yes, for awhile 3. No

11. Over the last two weeks, how many times have you had five or more drinks in a row?

A drink is a glass of wine, a bottle of beer or wine cooler, a shot of liquor, or a mixed drink.

1. None
2. Once
3. Twice
4. 3 to 5 times
5. 10 or more times

12. What is the average number of drinks you consume a week?

☐☐ 01= one per week or less.

13. Do you usually drink something alcoholic every day?

1. YES 2. NO

14. When you drink alcoholic beverages, how high or buzzed, do you usually get?

1. Not at all high or buzzed
2. a little high or buzzed
3. Moderately high or buzzed
4. Very high/drunk/wasted

15. When you drank alcoholic during the past year, how often were you?

	Not at All	A Few of the Times	Some of the Times	Most of the Times	Every Time
a. Alone	1	2	3	4	5
b. With a date or spouse	1	2	3	4	5
c. With friends	1	2	3	4	5

16. What have been your MOST IMPORTANT reasons for drinking alcoholic beverages? *(Circle all that apply)*

1. To relax or relieve tension
2. To have a good time with my friends
3. To get drunk
4. To fit in with a group I like
5. To get away from my problems or troubles
6. Because of boredom, nothing else to do
7. To relieve depression
8. To get through the day
9. To get to sleep
10. To enhance sexual pleasure or opportunity
11. To increase my enjoyment of music or food
12. Because I like the taste
13. Because it's the thing to do
14. Because I feel better when I'm drinking
15. To help me be less shy with others
16. To celebrate at ceremonial occasions
17. Other _____

17. Compared to before you came to OU, has your current use of alcohol...

1. Increased
2. Decreased
3. Stayed the same

18. Please indicate how often during the past year you have experienced the following as a result of drinking.

	Never (1)	1-2 Times (2)	3-5 Times (3)	6+ Times (4)
a. Had a hangover	☐	☐	☐	☐
b. Performed poorly on a test or important project	☐	☐	☐	☐
c. Missed a class or work due to drinking	☐	☐	☐	☐
d. Been in trouble with police or University authorities	☐	☐	☐	☐
e. Damaged property, pulled a fire alarm, ect.	☐	☐	☐	☐
f. Been hurt or injured after drinking	☐	☐	☐	☐
g. Got nauseated or vomited	☐	☐	☐	☐
h. Driven a car while under the influence	☐	☐	☐	☐
i. Been arrested for driving while under the influence	☐	☐	☐	☐
j. Got into a heated argument or fighting while drinking	☐	☐	☐	☐
k. Had a memory loss after drinking	☐	☐	☐	☐
l. Been embarrassed or disturbed by something you did while drinking	☐	☐	☐	☐
m. Were sexually harassed or molested after drinking	☐	☐	☐	☐
n. You harassed or molested someone else after drinking	☐	☐	☐	☐
o. Seriously thought about suicide	☐	☐	☐	☐
p. Someone you know said you should cut down	☐	☐	☐	☐
q. Friend or significant other threatened to leave	☐	☐	☐	☐
r. Were afraid you might be alcoholic	☐	☐	☐	☐
s. Been annoyed by people criticizing your drinking	☐	☐	☐	☐
t. Had a drink first thing in the morning as an "eye opener"	☐	☐	☐	☐
u. Felt guilt or remorse after drinking	☐	☐	☐	☐
v. Felt that you should cut down on your drinking	☐	☐	☐	☐
w. Were disciplined at work because of drinking	☐	☐	☐	☐
x. Drinking may have hurt your chances for a promotion, raise, or better job	☐	☐	☐	☐

19. When you are drinking, how do you usually decide when to stop

1. I drink about the same amount as the people around me.
2. My body tells me when to stop or slow down.
3. I stop when the alcohol is gone or I pass out.
4. I know from past experience how many drinks I can handle.

28. How often do you consciously do the following things to limit the amount or effect of alcohol you drink?

	Never	Seldom/ Some-Times	Often	Always
a. Avoid drinking with heavy drinkers	1	2	3	4
b. Select drinks that your can drink slowly	1	2	3	4
c. Limit the number of drinks you can have in a given time	1	2	3	4
d. Drink non-alcoholic drinks	1	2	3	4
e. Diagnose non-alcoholic drinks to look like alcoholic drinks	1	2	3	4
f. Rewarding yourself for limiting drinking	1	2	3	4
g. Punish yourself for not limiting drinking	1	2	3	4
h. Eat before or while drinking	1	2	3	4
i. Confine drinking to certain time periods	1	2	3	4

THE NEXT QUESTIONS ARE ABOUT VARIOUS TYPES OF DRUGS

21. Have you ever used the following types of drugs? DO NOT include drugs used under a doctor's prescription.	In you lifetime?		In the last 12 months?		On how many occasions have you used in the last 30 days?						
	No	Yes	No	Yes	0	1-2	3-5	6-9	10-19	20-39	+40
	(1)	(2)	(1)	(2)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
a. Marijuana (grass, pot) or hashish (hash)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
b. Crack cocaine (cocaine in chunk or rock form)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
c. Cocaine in any form	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
d. LSD ("acid")	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
e. Other psychedelics (mescaline, peyote, psilocybin, PCP)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
f. Amphetamine, methamphetamine (including uppers, speed, beanies, dexies)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
g. Crystal meth ("ice")	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
h. Downers (e.g., Halcyon, Dalmane, barbiturates, goofballs, reds, yellows)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
i. Tranquilizers (e.g., Librium, Valium, Ativan)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
j. Heroin (smack, horse, skag)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
k. Other narcotics (e.g., methadone, opium, morphine, codeine, Demerol)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
l. Inhalants (glue, aerosol sprays, nitrites, other gases or sprays)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
m. Designer drugs (e.g., ecstasy, MDMA)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
n. Anabolic Steroids	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
22. Think about any drugs mentioned above, have you ever used any of them through injection by needle?	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐

23. Have you used the following types of drugs based on a doctor's prescription?	In you lifetime?		In the last 12 months?		On how many occasions have you used in the last 30 days?						
	No	Yes	No	Yes	0	1-2	3-5	6-9	10-19	20-39	+40
	(1)	(2)	(1)	(2)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
a. Sleeping meds. (e.g., Halcyon, Dalmane, Nembutal.)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
b. Minor Tranquilizers (e.g.,Librium,Valium,Ativan)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
c. Stimulants (e.g., weight loss pills, Ritalin)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
d. Prescription pain medication (e.g., codeine, Darvon, Demerol, Tylenol 3)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐

24. Have you ever used the following types of over-the-counter drugs?	In you lifetime?		In the last 12 months?		On how many occasions have you used in the last 30 days?						
	No	Yes	No	Yes	0	1-2	3-5	6-9	10-19	20-39	+40
	(1)	(2)	(1)	(2)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
a. Diet pills (e.g., Dexatrim, Dietac, Prolamine)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
b. Stay -awake pills (e.g., NoDoz, Vivarin)	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐
c. Other non-prescription stimulants or pep pills	☐	☐→	☐	☐→	☐	☐	☐	☐	☐	☐	☐

THE NEXT QUESTIONS ARE ABOUT THE SOCIAL CONTEXT OF ALCOHOL AND DRUG USE

25. Some people like having alcohol available at social gatherings, while others don't. Which do you prefer?

1. Have available 2. Have available with limits 3. Not have available

26. Now think about the parties and social events you attended in the last 6 months.

If you have not attended parties or social events, check here, and go to Question 27 ☐

At these social events, how often...	Never	Seldom	Some-times	Usually	Always
a. Was alcohol served or available?	1	2	3	4	5
b. Were other beverages equally available?	1	2	3	4	5
c. Was food served or available?	1	2	3	4	5
d. Was drinking the reason for the event?	1	2	3	4	5
e. Did most people drink but not get drunk?	1	2	3	4	5
f. Did most people get drunk?	1	2	3	4	5
g. Did you get drunk?	1	2	3	4	5
h. Did you feel pressure to drink alcohol?	1	2	3	4	5
i. Did you feel pressure to use other drugs?	1	2	3	4	5
j. Were games played that require or encourage a lot of drinking?	1	2	3	4	5
k. Did you take part in drinking games?	1	2	3	4	5

27. Please indicate how often during the past 12 months you have experienced the following as a result of other people's drinking or drug use.

At these social events, how often...	Never (1)	1-2 Times (2)	3-5 Times (3)	6-9 Times (4)	10+ Times (5)
a. Others' drinking use made a occasion or event better or more enjoyable	☐	☐	☐	☐	☐
b. Others' drinking use made you feel more comfortable	☐	☐	☐	☐	☐
c. An enjoyable event was spoiled by others' drinking or drug use	☐	☐	☐	☐	☐
d. Your work or study was disrupted	☐	☐	☐	☐	☐
e. Your sleep was disrupted	☐	☐	☐	☐	☐
f. Your property was damaged or stolen	☐	☐	☐	☐	☐
g. You were embarrassed by someone's behavior	☐	☐	☐	☐	☐
h. You were sexually harassed or assaulted by someone drunk or high	☐	☐	☐	☐	☐
i. You feared violence or were attacked or assaulted	☐	☐	☐	☐	☐
j. You had to take care of someone with a drinking or drug problem	☐	☐	☐	☐	☐

28. Circle each place where you used alcohol or drugs during the past year. (Circle all that apply)

	Alcohol	Drugs
a. DID NOT USE	1	1
b. Bar or restaurant	2	2
c. At home	3	3
d. Someone else's residence	4	4
e. Formal OU event	5	5
f. Informal OU event (e.g., Small gathering)	6	6
g. Off-campus meeting or Conference	7	7
h. During or before work	8	8
i. During or before class	9	9
j. At parent's home	10	10

29. When a friend or colleague's chronic drinking or drug use concerns you, would you be likely to....

	Very Likely	Likely	Not Likely
a. Help restrain or control dangerous behavior	1	2	3
b. Try to reduce the person's access to the alcohol or drug	1	2	3
c. Contact an authority to assist the person if they in a crisis (e.g., medical care, police, security)	1	2	3
d. Report the person to his/her advisor or some other authority	1	2	3
e. Help the person with responsibilities if he/she is not able to handle regular tasks	1	2	3
f. Make allowances for the person's problem and do not expect him/her to perform as well as usual	1	2	3
g. Cover for the person son he/she won't get in trouble with authorities	1	2	3
h. Counsel the person about his or her reasons for misuse of alcohol or drugs	1	2	3
i. Confront the person and ask him or her to stop using	1	2	3
j. Talk to the person about what you see happening, with specific examples	1	2	3
k. Try to get the person to a source of help, such as Counseling services or the Faculty and Staff Assistance Program	1	2	3
l. Other	1	2	3

30. When you don't do anything, what is the usual reason?

1. It's the person's own responsibility.
2. I have no authority to take action.
3. I don't know what to do.
4. It wouldn't do any good.
5. I might lose the person as a friend.
6. Other _____

THESE NEXT QUESTIONS ARE ABOUT OTHER PEOPLE'S USE OF AND ATTITUDES ABOUT ALCOHOL AND OTHER DRUGS. PLEASE MAKE YOUR BEST ESTIMATE, BASED ON YOUR OBSERVATIONS OF OTHERS.

31. Think of the people you see socially...	a. About how many would you estimate...				b. For those that do, about how often (best estimate):						
	None	A few	Some	Most	Less than 1/month	Once/ Month	Twice/ Month	Once/ Week	2-4/ Week	5 times Week	Daily
a. Drink alcoholic beverages?	1	2	3	4	1	2	3	4	5	6	7
b. Drink to get drunk?	1	2	3	4	1	2	3	4	5	6	7
c. Use marijuana or hashish?	1	2	3	4	1	2	3	4	5	6	7

32. Now think about all adults...	a. About how many would you estimate...				b. For those that do, about how often (best estimate):						
	None	A few	Some	Most	Less than 1/month	Once/ Month	Twice/ Month	Once/ Week	2-4/ Week	5 times Week	Daily
a. Drink alcoholic beverages?	1	2	3	4	1	2	3	4	5	6	7
b. Drink to get drunk?	1	2	3	4	1	2	3	4	5	6	7
c. Use marijuana or hashish?	1	2	3	4	1	2	3	4	5	6	7

33. How much do you think people risk harming themselves (physically or in other ways) if they...	No Risk	Slight Risk	Moderate Risk	Great Risk	Can't Say
a. Smoke one or more packs of cigarettes/day	1	2	3	4	5
b. Try marijuana (pot, grass)once or twice	1	2	3	4	5
c. Smoke marijuana occasionally	1	2	3	4	5
d. Smoke marijuana regularly	1	2	3	4	5
e. Try LSD once or twice	1	2	3	4	5
f. Try cocaine once or twice	1	2	3	4	5
g. Have one or two drinks nearly every day	1	2	3	4	5
h. Have four or five drinks nearly every day	1	2	3	4	5
i. Have 5 or more drinks once or twice each weekend	1	2	3	4	5

34. Do you find the following behaviors acceptable or unacceptable? How about your friends, the people you see socially? How do most adults do you think they would find them acceptable or unacceptable?

	a. Do you find this...			b. Do your friends find this...			b. Do Most adults find this...		
	Accept-able	Don't Care	Unac-ceptable	Accept-able	Don't Care	Unac-ceptable	Accept-able	Don't Care	Unac-ceptable
a. Drinking alcoholic beverages to be sociable	1	2	3	1	2	3	1	2	3
b. Giving parties where alcohol is served	1	2	3	1	2	3	1	2	3
c. Giving parties where the only drinks are alcohol	1	2	3	1	2	3	1	2	3
d. Letting loose and having fun when drinking	1	2	3	1	2	3	1	2	3
e. Losing control when drinking	1	2	3	1	2	3	1	2	3
f. Drinking to get drunk	1	2	3	1	2	3	1	2	3
g. Being so drunk they throw up	1	2	3	1	2	3	1	2	3
h. Getting loud and aggressive when drinking	1	2	3	1	2	3	1	2	3
i. Drinking to get away from troubles	1	2	3	1	2	3	1	2	3
j. Drinking to fit in with a group	1	2	3	1	2	3	1	2	3
k. Providing alcohol to someone under age 21	1	2	3	1	2	3	1	2	3
l. Pressuring people to drink alcohol	1	2	3	1	2	3	1	2	3
m. Driving after two or three drinks	1	2	3	1	2	3	1	2	3
n. Making sexual advances to someone who is drunk or high	1	2	3	1	2	3	1	2	3

35. People who sell or serve alcohol are becoming increasingly liable for damages or injuries that can result from drunken behavior.

	a. Do you approve or disapprove of hosts and alcohol servers doing the following?			b. Do you think most adults would approve or disapprove?		
	Approve	Don't Care	Disap-Prove	Approve	Don't Care	Disap-Prove
a. Setting time limits on how long alcohol will be available	1	2	3	1	2	3
b. Require a trained server to serve drinks	1	2	3	1	2	3
c. Limiting the number of drinks to each person attending	1	2	3	1	2	3
d. Refuse drinks to people who appear intoxicated	1	2	3	1	2	3
e. Take car keys away from some one drunk who wants to drive	1	2	3	1	2	3
f. Check IDs to prevent under age drinking	1	2	3	1	2	3
g. Refusing to admittance to unserviced/unauthorized people.	1	2	3	1	2	3
h. Require that food be provided along with alcohol	1	2	3	1	2	3
i. Require that non-alcoholic beverages be available	1	2	3	1	2	3

THE FOLLOWING QUESTIONS ARE ABOUT NORMAN AND THE UNIVERSITY OF OKLAHOMA

36. Do you think advertising of alcohol affects how much people drink?
1. YES
2. NO
3. DON'T KNOW

37. Do you think campus publications and events should advertise alcohol beverages?
1. YES
2. NO
3. DON'T KNOW

38. Do you think the university has a responsibility to provide assistance services to people who have problems with alcohol or other drugs?
a. Services for faculty and staff: 1. YES 2. NO
b. Services for Students: 1. YES 2. NO

39. If you had a problem with alcohol or drugs, where would you be most likely to go to find help?
1. University Health Services (Goddard)
2. Employee Assistance Program
3. OU Counseling Clinic (Public Clinic)
4. Residence Hall
5. Greek office
6. Off-campus
7. Other _____
8. Not Sure

40. Have you or a dependent used treatment services for alcohol or other drugs since coming to OU?
1. YES
2. NO

41. Do you think the University's health benefits provide adequate coverage for alcohol and drug treatment?
1. YES
2. NO
3. DON'T KNOW

THE LAST QUESTIONS INVOLVE YOUR BACKGROUND AND CURRENT SITUATION

42. Role at University
1. Freshman
2. Sophomore
3. Junior
4. Senior
5. Law student
6. Graduate student
7. Post-graduate training
8. Not seeking a degree
9. Other _____

44. Student Status:
1. Full-time
2. Part-time
3. Not currently enrolled

45. In which school or college is your major area of study?
1. Architecture
2. Arts and Sciences
3. Business Administration
4. Education
5. Engineering
6. Fine Arts
7. Law
8. Liberal Studies
9. Graduate College
10. Other _____

46. Approximate grade point average,
on a 4-point scale: ☐.☐☐

47. Job Status:
1. Working Full-time
2. Working Part-time
3. Not working

48. Age: ☐☐

49. Gender:
1. Male
2. Female

50. Sexual orientation:
   1. Heterosexual
   2. Lesbian/gay
   3. Bisexual

51. Primary ethnic origin:
   1. American Indian/Native American
   2. Asian/Pacific Islander
   3. African
   4. Hispanic (Chicano/Latino/Mexican)
   5. Arab/Middle Eastern
   6. White/European (not of Hispanic Origin)
   7. Other _____

52. Are you an American Citizen:
   1. YES
   2. NO

53. Marital status
   1. Single
   2. Married/domestic partner
   3. Separated
   4. Divorced
   5. Widowed

54. Living with whom: *(Circle All that Apply)*
   1. Alone
   2. Parent(s) or other relatives
   3. Spouse or significant other
   4. Children
   5. Roommate(s)

55. Living where during the school year?
   1. Residence Hall
   2. Fraternity
   3. Sorority
   4. Student housing
   5. House/Apartment in Norman
   6. outside of Norman

56. Greek Affiliation?
   1. Yes
   2. No

57. Please indicate how many hour per week you spend on each on the following types of activities. *(Count each activity in only one category)*

Hours per week	None (1)	1-4 Hours (2)	5-9 Hours (3)	10-15 Hours (4)	16 or More (5)
a. Student organization(s)	☐	☐	☐	☐	☐
b. Participating in intercollegiate athletics	☐	☐	☐	☐	☐
c. Other physical activities (e.g., intramural athletics, walking, biking, ect. . .)	☐	☐	☐	☐	☐
d. Enjoying the arts (music, theater, ect.)	☐	☐	☐	☐	☐
e. Political activities	☐	☐	☐	☐	☐
f. Religious activities	☐	☐	☐	☐	☐
g. Volunteer work	☐	☐	☐	☐	☐
h. Leisure time with family or friends	☐	☐	☐	☐	☐

58. How important are religious or spiritual values to you?
   1. Not at all important
   2. Not very important
   3. Mildly important
   5. Important
   6. Very important

59. What position does your church or religion take regarding alcohol and other drugs?
(Circle All That Apply)
   1. NO CHURCH OR RELIGIOUS AFFILIATION
   2. Allows/supports moderate or ritual use of alcohol
   3. Allows/supports moderate or ritual use of other drugs
   4. Disapproves of alcohol use
   5. Disapproves of other (non-medicinal) drug use
   6. Takes no position on alcohol use
   7. Takes no position on other (non-medicinal) drug use

60. Which of the following statements best describes the use of alcoholic beverages by people in your household when you were growing up?
   1. Drinking was disapproved of; alcohol was not present.
   2. Alcohol was seldom drunk but occasional drinking was OK.
   3. Alcohol was drunk on special occasions (celebrations).
   4. Light or moderate drinking, but no drunkenness.
   5. Moderate to heavy drinking, with occasional drunkenness.
   6. Regular heavy drinking with frequent drunkenness.
   7. One or more adults in your home were treated for alcoholism.

Please Turn to the Next Page!!!!

Perceived Risk Instrument
(Amendment to Questionnaire)

List of Drugs	Level of Perceived Danger				
	No Danger	Slight Danger	Moderate Danger	Great Danger	Can't Say
a. Tobacco	1	2	3	4	5
b. Alcohol	1	2	3	4	5
c. Marijuana (grass, pot) or hashish (hash)	1	2	3	4	5
d. Crack cocaine (cocaine in chunk or rock form)	1	2	3	4	5
e. Cocaine in any form	1	2	3	4	5
f. LSD ("acid")	1	2	3	4	5
g. Other psychedelics (mescaline, peyote, psilocybin, PCP)	1	2	3	4	5
h. Amphetamine, methamphetamine (including uppers, speed, beanies, dexies)	1	2	3	4	5
i. Crystal meth ("ice")	1	2	3	4	5
j. Downers (e.g., Halcyon, Dalmane, barbiturates, goofballs, reds, yellows)	1	2	3	4	5
k. Tranquilizers (e.g., Librium, Valium, Ativan)	1	2	3	4	5
l. Heroin (smack, horse, skag)	1	2	3	4	5
m. Other narcotics (e.g., methadone, opium, morphine, codeine, Demerol)	1	2	3	4	5
n. Inhalants (glue, aerosol sprays, nitrites, other gases or sprays)	1	2	3	4	5
o. Designer drugs (e.g., ecstasy, MDMA)	1	2	3	4	5
p. Anabolic Steroids	1	2	3	4	5

Thank you for help participation in this survey. Your assistance is a vital part of our attempt to learn about the alcohol and drug use on the University of Oklahoma campus. In an effort to more efficiently and effectively conduct this survey, we would appreciate your feedback. Please complete the section below.

Thank you again for your help!

1. How long did it take you to complete the survey? _____

2. What, if any, items do you have questions about (lack of clarity, ect...)? _____

3. Please make any comments that may be helpful with future administration of this survey.

This Questionnaire was adapted from a similar survey conducted at the University of Michigan in 1990.

APPENDIX C

PROSPECTUS

STUDENTS' ATTITUDES AND PERCEPTIONS AS PREDICTORS OF DRINKING BEHAVIOR: IMPLICATIONS FOR STUDENT ALCOHOL EDUCATION PROGRAMS

INTRODUCTION

Background of the Problem

The present investigation involves the subject of alcohol use at the University of Oklahoma. The college experience is arguably one of the biggest developmental milestones in the lives of may people. It is a time when one begins to assume more adult roles and responsibility. For most beginning college and university students, college is a time of reduced parental supervision amidst many new social and academic pressures. Within this developmental experience, however, alcohol consumption is prevalent. This is particularly of concern given that only half of college undergraduate college students are legally old enough to drink (Johnson, O'Malley, & Bachman, 1994).

A survey conducted at the University of Michigan found that alcohol is used far more than other drugs by undergraduates as well as graduate students, faculty and staff (University of Michigan, 1993). A study at Louisiana State University revealed that 37%

of the respondents drink once or twice a week while 4% drink daily (Grenier, 1993). Similar results were found by Haberman (1994) in which she found that 90% of college students currently used alcohol or have used at least once in the past; 39% reported consuming alcohol at least weekly and less than 1% reported daily use (Haberman, 1994). Furthermore, the University of Michigan survey (1993) indicated that 18% of undergraduates considered themselves as having serious alcohol problems and report patterns of problem drinking by their peers (University of Michigan, 1993). This problem is not unique to one university as researchers at the University of Nebraska at Omaha found heavy alcohol, which was defined as 5 drinks in on setting, use to be accepted as normal consumption among the students (Hunnicutt & Davis, 1989; University of Michigan, 1993). This heavy alcohol use is estimated to occur among 40% of the undergraduate population (U.S. Department of Health and Human Services, 1994).

Some researchers believe that a higher percentage of college men than women are likely to drink, drink more often, consume more, and experience more drinking problems (Engs & Hanson, 1990). However, other researchers suggest that when students' body weights are used to compare estimated blood alcohol levels instead of absolute amount of alcohol consumed, females and males do not differ in amount of daily alcohol consumption (Skacel & Merritt, 1991). Furthermore, it is purported that place of residence influences the consumption of alcohol and risk for alcohol related problems such as substance abuse, legal issues, as well as social and educational difficulties.

Specifically, one study suggested that students living in residence halls are at a higher risk for such problems than students living elsewhere (Barnes, Welte, & Dintcheff, 1992). Other studies have consistently found that college students who are members of

fraternities and sororities consume more alcohol per week, engaged in heavy drinking more, and suffer more negative consequences from alcohol use than do nonmembers (Alva, 1998; Baer, Kivlahan, & Marlatt, 1995; Cashin, Presley, & Meilman, 1998).

In addition to demographic characteristics, attitudes about drinking, perceptions about drinking, and drinking behaviors have been investigated (e.g., Banks & Smith, 1980; Hamid, 1995; Klein, 1994). Of particular interest to the present investigation is the investigation by Baer, Stacy, and Larimer (1991) who examined the association between individual drinking patterns and the perceived drinking patterns of close friends and reference groups among college students. These investigators conducted two separate surveys of college students from fraternities, sororities, and dormitories ($\underline{N}$ = 131; $\underline{N}$ = 280). Across both studies, students reported that their friends drank more than they did. Furthermore, the data revealed that students' reports of others' drinking were exaggerated in that students' estimates of average drinking within their own social living groups were substantially higher than the average drinking within the group estimated from self-reports. This study greatly underscored the importance of examining college students' perceptions of drinking, but is only one of a few such studies that have examined this issue.

Statement of the Problem

Although much of the literature suggests that attitudes toward alcohol consumption on college campuses are a great concern, there is a call for further research to help assess and identify problematic alcohol behaviors (Barnes, Welte, & Dintcheff, 1992; Haberman, 1994). In addition, effective intervention strategies are needed to address students' needs and help support responsible drinking patterns. Before a strategic

intervention program can be developed, research is needed with regard to what variables predict alcohol use and what social psychological factors such as attitudes about drinking and perceptions about drinking are likely to influence changes in drinking behaviors. This information can help identify those "at risk" of alcohol interfering with their academics and personal lives as well as what prevention and intervention methods may be effective in decreasing this risk.

Purpose of the Study

Although previous studies have been completed concerning substance use by undergraduates, only limited studies have been conducted at the University of Oklahoma. The present investigation seeks to provide a comprehensive assessment of substance use of the undergraduate population on a university campus by not only assessing the amount of use itself, but numerous other variables, such as attitudes toward use, beliefs about substance use, and different population characteristics. Beyond just the identification of alcohol and drug using patterns at the University of Oklahoma, this university survey study examines the relative importance of personal attitudes towards drinking, perceptions of others' drinking attitudes, and perceptions of drinking norms in relation to personal drinking behavior. Thus, the primary purpose of the present investigation is to examine the relationship between attitudes towards, and perceptual norms of, drinking behaviors and self-reported levels of drinking. By simultaneously examining attitudes and perceptual norms, the unique influence of each will be ascertained. The goal is to develop a stable prediction equation that includes attitudes and perceptual norms to predict drinking behaviors above chance.

A second purpose for conducting this study is to understand the particular drinking and drug use patterns of undergraduate students at the University of Oklahoma. The results of this study will be used to discuss implications for an appropriate student assistance program directed toward both prevention and intervention of abusive alcohol behaviors. Developing strategies without first assessing the nature and magnitude of perceived problems could be both costly and detrimental to the university as well as the people effected by the premature intervention. The results of the present study will also be used to guide future research with regard to correlates of the college drinking experience.

Theoretical Rationale

The predictions of this investigation are largely based upon the theory of planned behavior (Ajzen, 1985). This theory is a revision of Ajzen and Fishbein's (1977) original theory of reasoned action. This theory is most applicable to the present investigation because it applies the three primary variables being used to predict drinking behavior: (a) subjective norms, (b) attitudes, and (c) perceived behavioral control. This theory suggests that these three dimensions all contribute to the prediction of behavioral intentions, which are good predictors of human behavior. This theory will be reviewed in more detail with the literature review. To date, however, Ajzen and Fishein's theory has been supported by numerous researchers as being able to predict alcohol use among college students (e.g., Laflin, Moore, Weis, & Hayes; O'Callaghan, Chant, Callan, & Baglioni, 1997; Trafimow, 1996).

Although the theory of planned behavior provided a solid basis for the prediction of alcohol use, the theoretical foundation of this investigation also rests on the several

other theoretical perspectives. In particular, because alcohol use is considered a health behavior, the dominant theories that pertain to health behavior change provide an appropriate backdrop for understanding alcohol use. These theories include: (a) the Health Beliefs Model, (b) Stages of Change Theory, and (c) Social Cognitive Theory. The Health Belief Model (HBM) was originally formulated in the 1950s and proposes that understanding individuals' perceptions related to the disease and the desired behavior change largely explain health behaviors. In sum, the HBM proposes that in order for a person to engage in a health behavior, they must perceive the "disease" as severe and personally threatening. Additionally, the HBM posits that in order for behavior change to occur, the benefits of the behavior change must outweigh the barriers to making the change.

The Stages of Change theory provides an understanding of how the change process occurs, which is particularly relevant when discussing how to change alcohol use among college students. In this theory, there are five stages of change: (a) precontemplation, (b) contemplation, (c) decision, (d) action, and (f) maintenance. The progression through these stages is not linear; individuals progression forward and backward from stage to stage at different times in the change process. The final goal, however, is that individuals end up in maintenance in which they are doing the things necessary to maintain the change.

Social Cognitive Theory, also known as Social Learning Theory, was developed by Bandura (1986) and proposes that behavior changes as a function of the environment, cognitive aspects of the person, and specific things related to the behavior itself. This

theory purports that the constant interplay between the individual and the environment determines individual behavior, a principle known as reciprocal determinism.

Each of these theories provides a different perspective on helping to understand health behaviors and are elaborated upon further in the literature review chapter. These perspectives are useful in helping to understand alcohol use and why, despite knowing the dangers of such use, college students continue to engage in the unhealthy behavior of excess alcohol consumption. Thus, although the theory of planned behavior serves useful for the specific predictions made in this study, these health change theories assist in understanding the behaviors and in formulating prevention and intervention efforts. At this juncture, it is now sufficient to provide the predictions that the theory of planned behavior supports.

Research Questions and Hypotheses

The hypotheses for this investigation will be examined by looking at the data collected by this researcher at the request of the Norman Prevention Coalition (Higher Education Committee) during the dates of January 1, 1997 through May 1, 1997.

This investigation is designed to examine two primary research questions. These questions are:

RQ1: Which of the following is the best significant independent predictor of specific drinking behaviors?: (a) attitudes toward drinking, which include personal attitudes toward drinking, perceptions of friends' attitudes toward drinking, and perceptions of others' attitudes toward drinking; (b) perceptions of drinking norms, which includes perceptions of friends' drinking levels and perception of others' drinking levels; or (c) perceived risks of alcohol use.

RQ2: Is a specific combination of the above variables a better predictor of specific drinking behaviors than any of the variables considered independently?

These research questions will be examined by testing three relevant hypotheses.

H1: Attitudes will be positively related with actual drinking behavior. More specifically, it is expected that:

H1a: Personal attitudes toward drinking will be positively related with actual drinking behaviors, consistent with the research of Banks and Smith (1980), Mills and McCarty (1983), Ratliff and Burkart (1984), and Hamid (1995).

H1b: Perception of friends' attitudes toward drinking will be positively related with actual drinking behaviors.

H1c: Perceptions of others' attitudes toward drinking will be positively related with actual drinking behaviors.

H2: Perceptions of drinking norms will be positively related to actual drinking behaviors. More specifically, it is expected that:

H2a: Perception of friends' drinking levels will be positively related to actual drinking behaviors.

H2b. Perception of others' drinking levels will be positively related to actual drinking behaviors.

H2c: Actual drinking behaviors will be more closely related to the perceptual norms of friends' drinking levels than the perceptual norms of others' drinking levels', consistent with the research of Baer et al., (1991).

H3: Perceived risk of alcohol use will be significantly related to actual drinking behaviors.

Limitations of the Study

The findings from this investigation must be interpreted in light of the limitations inherent in the study. The first limitation of this study surrounds the use of a self-report measure. This investigation assumes that participants will be honest in their reports of alcohol use. Although this limitation must be acknowledged, research in the area of social desirability demonstrates that ensuring anonymity, as will be employed in the present investigation, substantially reduces the influence of socially desirable responding (Paulhus, 1991).

Additionally, this investigation asks participants to estimate the drinking behaviors of their friends. The accuracy of these judgments, and who they refer to as friends, will largely be unknown. The assumption is that individuals will be able to accurately report on the behavior of others. Although this is a possible drawback of this investigation, there is some research which suggests that, while observer reports of attitudes are generally not accurate, reports of observable behavior, such as drinking, generally are (Paulhus, 1991).

Furthermore, the data collected from this investigation is purely correlational in nature. It does not allow for the inference of causality. However, if significant associations are not observed as expected this would nevertheless indicate that no causal association is present. That is, underlying all causal associations are significant associations (Campbell & Stanley, 1963). Yet, if a significant association does exist as predicted, then it is possible, but not definitive that this association is causal in nature.

RELATED LITERATURE

Literature on Alcohol Use in Colleges and Universities

Straus and Bacon (1953) were among the first researchers to examine the prevalence of drinking behavior that occurred on college campuses. In a national sample of approximately 15,000 college students, these authors reported that approximately 70% of students in American colleges and universities at least occasionally consumed alcoholic beverages. Saltz and Elandt (1986) reviewed the principal survey studies that had been conducted since the mid 1970s and reached a similar conclusion. The consumption by college students of at least one alcoholic beverage per month was approximately 90% across all studies. Although men on average consumed alcoholic beverages more than women, this difference was not consistent across studies. For men, the range of at least one alcoholic beverage per month was 91% and ranged from a low of 81% to as high as 98%. The average consumption across studies for women was 88%, but ranged from 78% to 98%. These drinking rates do not appear to be declining over the years. Across all studies, the average reports of students who are problem drinkers ranges from 10% to 25%. Approximately 4% to 5% of students are estimated to use alcohol on a daily basis.

The prevalence of alcohol use among college students still appears high in the current decade. In a study of college students at Louisiana State University, Grenier (1993) found that 37% of the students drank once or twice a week and that 4% consumed alcohol on a daily basis. The majority of the students sampled in their study reported that they drank to relax whereas only 35% reported that peer pressure motivated them to

drink. Additionally, Grenier found several factors which were associated with high alcohol consumption: (a) being male, (b) being in a Greek fraternity, (c) being a junior year student, (d) living off-campus, and (c) being of Caucasian ethnicity.

In a sample of 457 students at the University of Alberta, Canada, Svenson and Jarvis (1994) found that 90% of the students reported drinking at least once over the past year. In their study, they found that men were more likely to be heavier drinkers than women and that men were more likely than women to drive while intoxicated. Furthermore, these authors reported that women in their sample overall had healthier attitudes concerning alcohol use. Men were more likely than women to indicate that it was socially acceptable to be intoxicated and that drinkers do not suffer health problems as the result of drinking.

In a study of students at Rutgers University, O'Hare (1990) reported that 18% of their undergraduate sample were abstainers, 25% were light drinkers, and 19% were heavy drinkers. These authors also found that the number of abstainers declined with each year in college in that 29% of freshman were abstainers compared with only 9% of seniors. Furthermore, the number of heavy drinkers increased by year from 15% in freshman to 24% in seniors.

However, in reviewing the prevalence of alcohol use across universities it must be kept in mind that differences in geography exist. That is, the reports of alcohol use may be different across varying regions. The differences between campuses in alcohol use may be more reflective of the spurious influence of differences in geography than of anything else.

Nevertheless, in their annual national study of over 1,000 student per year, Johnston, O'Malley, and Bachman (1994) conclude that little decline in alcoholic consumption is occurring—especially among college students who report drinking five or more drinks at once (i.e., binge drinking) in the last two weeks. Furthermore, estimates of the proportion of college students who regularly engage in binge drinking has been estimated as being approximately 20%. Johnston et al. report that alcohol continues to be the most widely abused drugs and that binge drinking is extremely prevalent among American college students. Rabow and Newman (1984) have also observed that weekend binge drinking is the most common abuse of alcohol in this population.

Additionally, drinking among college students has been found to be associated with numerous individual and social problems. For instance, Berkowitz and Perkings (1986) have found that drinking problems among college students is associated with vandalism, difficulties with academic performance, accidents, and engaging in risky behaviors, such as driving while intoxicated and having unprotected sex. It has also been proposed that students with alcohol problems are less likely to become employed because of their poor academic performance (Lall & Schandler, 1991).

Universities are motivated to reduce problem drinking because of the associated social problems that impact the college community. Several problems are of predominant concern in the campus community. Public safety is one of the biggest concerns where behaviors, such as drinking and driving, assault, rape, alcohol poisoning, and personal injuries resulting from engaging in uninhibited behaviors, can have a substantial impact on the community as a whole. Additionally, social consequences such as these are most likely to receive media attention, which is generally not desired by the

college or university. These situations place universities in a reactive, rather than proactive, preventative position.

Grenier (1993) provided data on the frequency of alcohol-related problems experienced by college students. In his study of Louisiana State University students, 26% reported drinking and driving, 20% reported missing class due to having a hangover, and an inverse association between grade point average and drinking behavior was observed. Regarding attitudes toward drinking, Grenier found that 60% of LSU students felt that getting drunk was a normal part of the college experience and 57% felt that parties were more fun after having a few drinks. Reassuring, however, was the finding that 77% of students would use a free ride home if they were intoxicated and that 87% reported that they would stop a friend from driving while drinking.

Similarly, Globetti, Stem, Marasco, and Haworth-Hoeppner (1988) found that 33% to 41% of college students reported drinking and driving, 6% to 7% reported engaging in alcohol-related vandalism, 7% to 8% reported losing friends as the results of their alcohol usage, 17% to 23% reported experiencing alcohol-related academic problems, and 3% to 15% reported having problems with authority because of alcohol.

The high level of alcohol use and alcohol problems among college students is surprising given that persons with more education are more likely than others to adopt, and engage in, healthier behaviors. For instance, when compared with individuals without a high school diploma, college graduates have a lower prevalence of smoking, are less likely to be overweight, and are more likely to use seat belts when driving (Wechsler & Isaac, 1991).

Several studies have attempted to identify the predictors of alcohol use among college students. Haworth-Hoeppner, Globette, Stem, and Morasco (1989) found that attitudes toward alcohol actually affect drinking behavior. Students at a southern university with more permissive attitudes toward alcohol use were more likely than others to be heavy drinkers. Haden and Edmundson (1991) found that students used illicit drugs out of personal motivation but that the strongest predictor of alcohol use was social motivation. Several theories have been proposed that attempt to predict the drinking behavior of undergraduate college students. These theories will be reviewed next.

Theories of Drinking Behavior

In general, there are three common theoretical approaches to explaining drinking behavior (Edmundson, Clifford, Serrins, & Wiley, 1994). The first is a knowledge and attitudes approach. In this model, it is believed that by providing accurate knowledge regarding the negative consequences of alcohol and drug use will instill negative attitudes toward the use.

The second approach is a values and decision-making model. This perspective focuses on individuals' needs and values, and how substances fulfill these needs and influences these values. Decision-making skills are taught to enhance personal responsibility and self-reliance. Ideally, these skills and self-awareness should promote the notion of responsibility toward substance abuse (Edmundson et al., 1994).

The third approach is the social competency model, which was influenced by Bandura's (1986) social learning theory. In this approach, social situations, modeling, and social environments dictate the acquisition of individual psychosocial skills. A

deficiency in these skills places the individual at higher risk for substance abuse. Rectifying these deficiencies is believed to modify attitudes and behaviors toward drug taking (Edmundson et al., 1994). However, empirical research has only recently begun to test these assumptions regarding substance abuse prevention programs. These three perspectives have not yet been evaluated for their long-term efficacy, but early findings are promising.

In general, a cornerstone of research in the area of substance abuse has been centered on attempting to understand the reasons for drug and alcohol use. Many believe that this understanding will provide the ability to accurately predict substance abuse, and to perhaps even substance use. To this end, the theory of reasoned action, by Ajzen and Fishbein (1977) has been adopted by the drug and alcohol field as one way to understand this potentially self-destructive behavior.

Theory of Reasoned Action and Planned Behavior

According to the theory of reasoned action, actual behavior is a direct function of behavioral intentions. Specifically, this theory proposes that subjective norms, which are the sum of beliefs and motivation to comply, contribute to understanding behavioral intentions. The theory of planned behavior contends, attitudes, which are considered to be the sum of belief and evaluation, also contribute to behavioral intentions. Once behavioral intentions are known, the actual behavior can be predicted. Additionally, the strength of the relationship between behavioral intentions and actual behavior is directly related to the extent to which the individual can determine the occurrence or nonoccurrence of the behavior.

Many studies have supported the efficacy of the theory of planned behavior in explaining and predicting alcohol use. For example, Marcoux and Shope (1997) recently examined both the theory of planned behavior and the theory of reasoned action in the prediction of actual alcohol use among 3,946 5th-8th grade students in southeast Michigan. The intention to use alcohol explained 38% of the variance in frequency of alcohol use and 26% of the variance in alcohol use. Furthermore, attitudes, subjective norms, and perceived behavioral control—the three primary components of the Theory of planned behavior—explained 76% of the variance in the intention to use alcohol. These researchers reported, however, that despite the fact that both models were efficacious in predicting intention to use alcohol, the theory of planned behavior was more effective than was the theory of reasoned action.

These theories have also been successful in predicting alcohol use in young adults. For instance, in a sample of 122 college students, O'Callaghan, Chant, Callan, and Baglioni (1997) found that intentions to drink alcohol were predicted by subjective norms, attitudes, and perceived behavioral control and that intentions themselves were significantly predictive of self-reported use. These authors also reported, however, that past alcohol use was one of the strongest predictors of the intention to use alcohol and suggest that this variable be considered in a revision of the theory.

In a study of 250 college students, Trafimow (1996) found that attitudes were consistently better predictors of intentions to use alcohol than were subjective norms. However, this study found that this association depended upon which type of social drinking was being asked about. In particular, the association between attitudes and behavioral intentions was strongest when predicting drinking enough alcohol to get drunk

and weaker when asking about avoiding drinking and drinking enough to get a slight buzz. In contrast to the previous study, however, this author found that previous behavior and perceived behavioral control were significant predictors in predicting these three behaviors.

Another investigation by Laflin, Moore, Weis, and Hayes (1994) provides support for the theory of reasoned action. In a sample of 2,227 high school and college students, these authors found that attitudes and subjective norms related to alcohol and drug use did significantly predict alcohol and drug use, respectively. In another investigation on college students, Budd and Spencer (1985) examined 172 university students and found that normative beliefs about alcohol use did not predict behavioral intentions as the theory of planned behavior predicts. These authors did find, however, that behavioral intentions mediated the relationship between attitudes and subjective norms in the prediction of alcohol use.

This theory has also been widely applied to other health-related areas. For example, Sutton, McVey, and Glanz (1999) found support for the application of both the theory of reasoned action and the theory of planned behavior in predicting condom use in a national sample of 949 English youth. Humphreys, Thompson, and Miner (1998) found full support for the postulates of the theory of reasoned action when examining breastfeeding among a sample of 1,001 socioeconomically disadvantaged pregnant women. Additionally, Moore, Barling, and Hood (1998) found that the theory of reasoned action was strongly supported in predicting testicular and breast self-examination behavior among 116 male and 141 female adults, respectively.

In sum, the theory of reasoned action predicts that alcohol and drug attitudes and subjective norms are useful in predicting drug and alcohol use (Laflin, Moore-Hirschl, Weis, & Hayes, 1994). Thus, the present investigation uses the theory of reasoned action to predict that alcohol-related attitudes and norms will be predictive of drinking behavior. Yet, this theory does not entirely account for the use of perceived risk as a predictor of drinking behavior. This review will focus on a rationale for the inclusion of perceived risk as a prediction dimension of substance abuse after discussing the other theoretical models relevant to the present study.

Because alcohol use can be conceptualized as a health behavior, it is important to review the major models that have been used in the literature to explain, predict, and change health-related behaviors. In an attempt to explain these complicated behaviors, theorists have integrated psychological, environmental, and social factors into their theories. This review will focus on reviewing the three major models in this area: (a) Health Belief Model, (b) Stages of Change Model, and (c) Social Cognitive Theory (National Institute of Health, 1997).

Health Belief Model

The Health Belief Model (HBM) was originally developed in the early 1950s and was one of the first health behavior models developed to explain and predict preventative health, sick-role, and illness behaviors. Developed by Godfrey, Hockbaum, and Rosenstock (cited in Glanz, Lewis, & Rimer, 1990), the HBM helps to explain why individuals make particular health behavior decisions and has been widely used to create health prevention programs. The model integrates several theoretical perspectives, including social psychology and phenomenology, but relies heavily on Kurt Lewin's

view that individual perception largely determines behavior. Although the model originally concentrated on the association between health behaviors and the utilization of health services, later revisions of the model included motivational factors. The HBM was developed to help explain and predict why individuals failed to engage in preventative behaviors. One of the first studies to test the efficacy of the HBM was conducted by Hochbaum (1952). In this study, Hockbaum systematically examined the factors that contributed to patients' decisions to obtain chest x-rays for detecting tuberculosis. Since this landmark study, however, the HBM has been applied to various different kinds of health behaviors.

According to the HBM there are five dimensions that contribute to behavior change. These dimensions include: (a) perceived severity, which refers to the degree to which individuals believe that the health problem is serious; (b) perceived threat, which refers to the extent that individuals believe that they are personally vulnerable to the health problem; (c) perceived benefit, which refers to the extent to which individuals believe that engaging in a particular behavior will diminish the perceived threat; (d) perceived barriers, which refer to the obstacles that individuals believe exist in order for them to change their current behavior; and (e) self-efficacy, which refers to the beliefs individuals have regarding their ability to change their behavior (Glanz, Lewis, & Rimer, 1990).

In evaluating the perceived severity, individuals form an impression of how serious the effects of a given health problem will have on their functioning. Individuals are believed to evaluate a wide spectrum of dimensions when examining severity, such as

the effect on their personal and work functioning, financial difficulties, burdens on family and friends, the degree of pain experienced, and other relevant factors.

In considering perceived threat, this model proposes that there is tremendous inter-individual variability in perceptions of being vulnerable to a health problem. Individuals that are high in this dimension feel that there is a real danger that they can be personally be affected by the medical condition or disease. At the other end of the spectrum, individuals low in perceived susceptibility are in denial that they could potentially contract the disease.

The third perception that relates to health-related behaviors involves the perceived benefits of taking action. Individuals must perceive that specific actions will result in the prevention of the disease or in dealing with the medical problem. This perception is believed to only occur after individuals have recognized that they are susceptible to the disease. Thus, beliefs about the benefits of action play a vital role in determining if appropriate health-related behaviors are performed.

Similarly, perceptions pertaining to the barriers to taking action also play a direct role in determining if individuals will engage in specific behaviors. There are many instances in which individuals may have perceptions of severity, feel personally threatened, and believe in the benefits of taking action, but not take the action because there are too many perceived obstacles to doing so. According to the HBM, barriers can come in many forms but generally relate to the inconvenience, cost, and emotional and physical pain related to taking the action

Lastly, if individuals do not have sufficient self-efficacy regarding their ability to change, they will be less likely to engage in the health-promoting behaviors. The

personal beliefs regarding their own abilities will play a tremendous role in determining whether individuals will engage in appropriate health behaviors—even when the aforementioned perceptions are positive. Furthermore, this theory also proposes that there must be cues to action in order for individuals to engage in the appropriate behaviors. This means that either internal or external cues must exist to trigger the behavior that is necessary to prevent or deal with a particular health problem or disease. It is also believed that certain demographic, sociological, and structural variables that can serve to influence individual's decision.

Although the HBM provides a concrete way of understanding health behaviors, it is not without its limitations. For instance, the model has been criticized for focusing too heavily on beliefs and ignoring other pertinent factors that may influence health behaviors, such as previous experience and cultural and socioeconomic influences. has not always been supported by the empirical literature. Some propose that it is for this very reason that the research on HBM is not entirely supportive of the theory. However, it is also important to recognize that the studies that have been done on HBM utilize different questions to examine the same beliefs, thereby making the results of the studyies difficult to compare.

The HBM has been widely used in research on health behaviors but has been less widely used than the theories of reasoned action and planned behavior in studying alcohol use. Still, several studies have supported the application of this theory to alcohol use. One of the most notable studies in this area was conducted by Minugh, Rice, and Young (1998) on a sample of 41,104 adults. These authors found that health beliefs and behaviors were significantly correlated with alcohol use, even after controlling for

demographic influences. Furthermore, the HBM was supported equally for men and women; no gender differences were found. Sands, Archer, and Puleo (1998) examined the HBM in 125 and 231 female college students and found that risk of alcohol abuse was significantly predicted by perceived severity and barriers, self-efficacy, and social influences. Thus, there is a sound empirical basis in applying this theory to alcohol use in a college population.

Stages of Change Model

The Stages of Change model (Prochaska, 1979) is another theory that is widely used in explaining health-related and the addiction behaviors. The biggest contribution of this model is in its explanation of how—but not necessarily why—behavior change occurs. This model proposes five stages of change, including: (a) precontemplation, wherein individuals are not considering behavioral change; (b) contemplation, where individuals begin to consider changing their behavior; (c) decision, where individuals decide they will change their behavior and actively create a plan on how they will do it; (d) action, where individuals implement their behavior-change plan; and (e) maintenance, where individuals maintain their behavior change and continue the beliefs and behaviors responsible for such a change (Glanz, Lewis, & Rimer, 1990).

According to this model, individuals do not go through the steps in a linear fashion. Instead, there is a movement into and out of various stages, sometimes progressing forward and other times slipping backwards. The model recognizes that there are times in individuals' lives where change is more difficult than other times. In applying this model, most health programs focus on assisting individuals to advance their

stage of change so that they will be closer toward the desired behavior change (Glanz, Lewis, & Rimer, 1990). This theory is widely used in the field of chemical dependency.

Social Cognitive Theory

The Social Cognitive Theory by Bandura (1986) is another popular theory that is used to explain health behaviors. This theory proposes that individuals' behavior changes as a function of the environment, elements of the person, and specific things related to the behavior itself. Social Cognitive Theory believes in what it calls "reciprocal determinism," which refers to the constant interplay between the individual and the environment in determining behaviors (Rosenstock, Strecher, & Becker, 1998).

In the Social Cognitive Theory, reinforcements and punishments play a vital role in determining behavior. However, this theory also proposes that individuals must have the capability to change in order for change to occur. This means that individuals must learn exactly what they must do and how to do it. This theory further proposes that behavior change is influenced by how important individuals perceive the desired result that the behavior change will create. Behavior change is only believed to occur when the result is highly desired by the person. Self-efficacy expectations are the second cognitive factor that is believed to underlie behavior change. This means that individuals must believe that they have the capacity to change their behavior. Outcome expectancies, which refer to the benefits that individuals expect to receive by engaging in the behavior, are the third cognitive dimension that is proposed to play a crucial role in behavior change (Rosenstock, Strecher, & Becker, 1998).

Perceived Risk and Substance Abuse

Perception of risk has been found by other investigators to actually decrease substance abuse (Bachman, Johnston, & O'Malley, 1988). For instance, from their empirical investigation of the influence of perceived risk on substance abuse, Gonzalez and Haney (1990) commented, "...it is evident from the results of this study that perceptions of risk significantly predict usage patterns and attitudes toward the use of various drugs" (p. 314). Additionally, Gonzalez (1989) suggested that the perceptions of risk regarding the use of substances is an important mediating variable in motivating students to engage in preventative behavior.

A study by Bachman, Johnston, and O'Malley (1988) found that the most significant predictor of alcohol use was the perceived risk of alcohol. Perception of risk was also significantly predictive of tobacco use, but the ability for it to predict cannot be generalized to all substances; Bachman et al. found that the predictability of risk is specific to each substance. This author states that to affect the perception of risk of a given substance, the information must be specific for each substance and disseminated from a source that has a perception of accuracy and provides the information in sufficient enough detail. Thus, it is recommended that methods need to be incorporated that will influence the perceived risk of those substances where inaccurate perceptions of risk exist.

Rhodes, Corby, and Wolitski (1990), however, pointed out that perceptions of risk can be overridden. In their investigation, intravenous drug users continued to share needles even after understanding the risk of contracting the HIV virus. The exact factors that contribute to this are not yet fully understood.

History of Alcohol and Drug Use at the University of Oklahoma

The issue of Alcohol and Drug use at the University of Oklahoma was first presented to me by the Norman Prevention Coalition (Higher Education Committee) by way of faculty advisor Dr. Avraham Scherman. The Coalition had become aware of a similar study conducted at the University of Michigan in 1993 and decided to pursue assessment of the same information for OU. After looking into what resources would be needed to conduct such a study, the coalition agreed to fund a pilot study to start the process. An initial grant of $3,000 was obtained from the Coalition and a grant of $1,000 was obtained from the Oklahoma Psychological Association. The pilot study included students, faculty and staff and was administered by a mail-out survey through regular and campus mail. Although the response rate for undergraduate students was approximately 35%, the response rates for the faculty and staff were below 20%. Due to these response rates and the limited resource left over from the pilot project, this study was limited to the undergraduate population. Also, due to the cost and low response rates in the pilot project, the administration of the surveys used in this investigation was completed through group administration rather than mail-out.

METHODOLOGY

Methodological Approach

This investigation will be archival in nature in that the analyses will be based upon a survey conducted by the University of Oklahoma. The data that will be used to test the hypotheses set forth in the present investigation were collected using the survey methodology, which allows for both descriptive and correlational uses. Because the hypotheses in this study are correlational in nature, the present study mostly emphasizes the correlational approach. The survey used employed a self-administered, self-report format versus conducting the survey via an in-person or telephone format. This modality was most appropriate given that the objective was to reach a wide audience of the University population in a short period of time. Additionally, the use of an anonymous self-report survey greatly reduces socially desirable responding whereas the other survey methodologies would likely increase the chances of this response bias occurring.

Because this study is predictive in nature, the independent variables will refer to the predictor variables and the dependent variables as the outcome variables. Four different drinking variables, which measure four different types of drinking behaviors, will be used in combination as the dependent measure. These include: (a) controlled drinking, as measured by participants' self-reported drinking behavior; (b) getting drunk, as measured by participants' report on the number of times they got drunk in the past year, (c) binge drinking, as measured by participants' report of the number of times in the last two weeks they had five or more drinks in a row; and (d) how many drinks per week students report consuming.

This study will employ six different independent variables: (a) personal attitudes toward drinking; (b) perceptions of friends' attitudes toward drinking, (c) perceptions of others' attitudes toward drinking; (d) perceptions of drinking norms, as assessed by perceptions of friends' drinking levels; (e) perceptions of drinking norms, as assessed by perceptions of other students' drinking levels; and (f) perceived risks of alcohol use.

Selection of the Sample

The sample used for this investigation was comprised of a probability sample of 1,000 randomly selected undergraduate students at the University of Oklahoma collected in the spring semester of 1997. A list of undergraduate courses was randomly selected until the total enrollment of classes was over 1,000 students. The list of class enrollment status was obtained from the University administration. After permission was granted from each course instructor, the researchers presented the study to the students and the surveys were distributed. All surveys were collected during the following class period. A total sample size of 690 was obtained from the 1000 students sampled. It was made clear, through a handout and the class presentation, that participation is the study is completely voluntary. The distribution of gender was expected to represent an equal number of males and females. Furthermore, the distribution between freshman, sophomore, juniors, and seniors sampled was expected to represent the actual breakdown of these classes at the University of Oklahoma.

Participants will benefit from this investigation through the knowledge gained from the data they provide. If the data appears to show a need to address alcohol and drug issues on campus, the students will be the beneficiaries of any intervention programs implemented by the university to help curve the identified problems. Due to the

voluntary and anonymous nature in which the survey is returned, there was absolutely no risk to the participants in this study.

Given that a sample size of 100 is all that is all that is necessary to obtain statistical power at .80, assuming an alpha of .05 and a medium effect size (i.e., $R^2 = .13$ and $r = .30$), this sample size will have sufficient statistical power (i.e., Power = 1.0) to reject the null hypothesis when it is false (Cohen, 1988).

The Survey

The data for this investigation was collected from the administration of the Use of Alcohol, Tobacco, and Other Drugs in the Community Survey, which was developed by the University of Michigan's Initiative on Alcohol and Other Drugs (Hamid, 1995). The survey was originally developed to gather data to assist in identifying trends and changes, identify individuals who may be at high-risk, and to help in designing alcohol and drug prevention programs. Hamid (1995) reported this index as having a Cronbach coefficient alpha of .94. The large significant association between personal attitudes toward alcohol use and actual drinking behavior ($\underline{r} = .67$) found by Hamid (1995) supports validity of this index. This questionnaire is shown in Appendix A.

The questionnaire contains a total of 60 items, many of which have several responses within them. Forty-one items are designed to measure five domains related to alcohol and drug use: (a) the frequency of the consumption of alcohol, tobacco, and illicit, prescription and over-the-counter drugs; (b) the problems that occur as the result of such usage; (c) the place and social circumstances of the consumption of alcohol; (d) the strategies used to regulate drinking; and (e) the perceptions of norms and attitudes about drinking and drug use that are present in community and peer groups. The last 19 items

ask relevant sociodemographic and descriptive information, such as respondents' ethnicity and religious affiliation.

In the present investigation, the focus is on actual drinking behaviors, personal, friends', and others' attitudes toward drinking, drinking norms, and perceptions of the risk of alcohol use. Other items will be examined on an exploratory basis and will not be reviewed in depth here.

Actual Drinking Behavior

Four items on the survey will be used to assess participants' actual drinking behavior, the outcome variable for this study: (a) item 5a-c, (b) item 9a-c, (c) item 11, and (d) item 12. Item 5a-c asks participants, "On how many occasions (if any) have you had alcoholic beverages to drink?," and asks them to rate their response to this question from 1 (0 occasions) to 7 (40+ occasions). Participants rate their response in reference to three different temporal durations: (a) "in your lifetime?" (5a), (b) "during the last 12 months" (5b), and (c) "during the last 30 days" (5c). Total scores for this question are obtained by summing the responses to 5a, 5b, and 5c. Thus, scores can potentially range from 3 to 21, with higher numbers being indicative of higher drinking behavior.

Using a similar format used by item 5a-c, item 9a-c asks respondents about the number of times they have been drunk: "On how many occasions (if any) have you been drunk or very high from drinking alcoholic beverages?" The same 7-point rating scale that is used in item 5a-5c is also used in item 9a-c (i.e., 0 occasions = 1 to 40+ occasions = 7). Ratings are provided for drunk occasions over their lifetime, the past 12 months, and the past 30 days, as was done for item 5a-c. As will be done with item 5a-c, total scores for item 9a-c will be obtained by summing the response to the three parts. Scores

will potentially range from 3 to 21, with higher scores being indicative of a higher frequency of being drunk.

In item 11, respondents are asked, "Over the last two weeks, how many times have you had five or more drinks in a row?" Participants are given the definition of a drink as being "... a glass of wine, a bottle of beer or wine cooler, a shot of liquor, or a mixed drink." They are then to choose one of the six responses: (a) "none" (1), (b) "once" (2), (c) "twice" (3), (d) "3 to 5 times" (4), (e) "6 to 9 times" (5), or (e) "10 or more times" (6). Item 12 asks participants to write in a number in response to the question, "What is the average number of drinks you consume a week?" The responses provided to these last two questions will serve as their score on these items.

To assess the hypothesis, a summative score will be used in which scores from all four items will be added together to obtain the final score. The lowest possible value for these scores will be 6 and the highest possible value will depend upon participants' responses to item 12. Higher values will indicate more severe drinking behavior. The hypotheses will also be tested, however, on each of the individual items to gain a better understanding of the relationships observed.

Attitudes Toward Drinking

Item 34 will be used to measure participants' personal, their friends, and others' attitudes toward drinking. This item lists 14 behaviors related to drinking and are asked to rate each behavior on a 3-point scale as "acceptable" (1), "don't care" (2), or "unacceptable" (3). These behaviors include the following: (a) drinking alcoholic beverages to be social, (b) giving parties where alcohol is served, (c) giving parties where the only drinks are alcoholic, (d) letting loose and having fun when drinking, (e) losing

control when drinking, (f) drinking to get drunk, (g) being so drunk they throw up, (h) getting loud and aggressive when drinking, (i) drinking to get away from troubles, (j) drinking to fit in with a group, (k) providing alcohol to someone under the age of 21, (l) pressuring people to drink alcohol, (m) driving after two or three drinks, and (n) making sexual advances to someone who is high or drunk.

To obtain total scores for the personal, friends', and others' attitudes toward drinking, responses to the 14 items will be summed in a unit weighting fashion. This will yield total scores that can potentially range from 14 (acceptable) to 42 (unacceptable), with higher scores being indicative of more conservative values. This scoring method is different from that employed by Hamid (1995), one of first authors to use this scale to evaluate empirical questions. Instead of unit weighting each value, Hamid scored one point for each item respondents endorsed as either "acceptable" or "don't care". Using this method, scores ranged from 0 to 14 with higher values indicating more liberal attitudes toward drinking. However, one of the drawbacks of using this approach is that the range of responding is potentially restricted and such restricted ranges can reduce the magnitude of correlation coefficients (Tabachnick & Fidell, 1996). Thus, by using a unit weighting approach, it is less likely that this restriction of range problem will exist in the present study. However, to examine the differences in these two scoring approaches, item 34 will be scored both ways, analyses will be conducted using both scoring systems, and the results of these different approaches will be compared. This will thereby provide a better understanding for future researchers on how best to approach scoring this item. Each of the three dimensions that are measured by item 34 will be briefly reviewed.

Personal attitudes toward drinking. To evaluate respondents' personal attitudes toward drinking, participants are asked to respond to each of the 14 behaviors by endorsing the 3-point scale in response to the question, "Do you find this...." In the stem of this question, respondents are to provide their own opinion of the 14 behaviors. The coefficient alpha reported by Hamid (1995) for this index was .72. The large significant association between personal attitudes toward alcohol use and actual drinking behavior (r = .67) found by Hamid (1995) supports validity of this index.

Friends' attitudes toward drinking. To evaluate respondents' perceptions of their friends' attitudes toward drinking, participants are asked to respond to each of the 14 behaviors by endorsing the 3-point scale in response to the question, "Do your friends find this...." In the stem of this question, respondents are to provide an estimate of whether or not their friends find the 14 behaviors as acceptable or unacceptable. The survey defines friends for the respondent as being, "the people you see socially." Hamid (1995) reported the coefficient alpha for this index to be .76. Hamid also reported correlation between this index with actual drinking behavior as being $r = .32$ ($p < .001$), which supports the validity of this index.

Others' attitudes toward drinking. To evaluate respondents' perception of others' attitudes toward drinking, participants are asked to respond to each of the 14 behaviors by endorsing the 3-point scale in response to the question, "Do most students find this...." The stem of this question asks respondents to estimate the attitudes of most students as a whole. The coefficient alpha of this index has been reported as .73 (Hamid, 1995). The correlation of others' attitudes with actual drinking behavior has been reported as small, but statistically significant ($r = -.19$, $p < .01$) by Hamid (1995).

Drinking Norms

Items 31b and 32b will be used to evaluate drinking norms. Item 31b measures drinking norms of the respondents' friends and 32b measures drinking norms of others. For both of these items, participants are asked to provide two ratings. The first rating asks them to estimate how many people (i.e., "friends" for item 31b and "other students" for item 32b) drink alcoholic beverages. Scale values range from 1 (none) to 4 (most). In the second rating, respondents are ask to endorse from 1 (less than once per month) to 7 (daily) the frequency with which friends (31b) or other students (32b) drink alcoholic beverages.

To obtain separate total drinking norm scores for friends and others, the rating for the number of people drinking will be multiplied by the frequency rating. Thus, the resulting product will provide an overall index of drinking norms that includes both how many people and how severe the drinking behavior is. Higher values will be representative of norms which reflect a higher occurrence and severity of drinking among their friends and other students. The "how many" and "frequency" ratings will also be looked at separately, however, to provide more detailed information about the norms pertaining to alcohol usage. Reliability indices are not available for this index. The validity of this index, however, is supported by the large statistically significant association found between this index and drinking behavior ($r = .51$, $p < .001$) reported by Hamid (1995).

Perceived Risk of Alcohol Use

Perceived risk of alcohol use will be measured using items 33g, 33h, and 33i. The stem of all three of these items asks students to report on, "How much do you think people risk harming themselves (physically or in other ways) if they...." The rating scale for this item ranges from 1 (no risk) to 5 (can't say), with a value of 4 indicating great risk. The differences between these three items are only in the frequency of alcohol usage that is portrayed. For instance, item 33g states, "Have one or two drinks nearly every day," item 33h states, "Have four or five drinks nearly every day," and item 33i states, "Have five or more drinks once or twice each weekend."

For the purpose of testing the hypotheses in this study, scores of 5 will be coded as 0 to eliminate the influence of the "can't say" option. Next, scores for items 33g-i will be summed to yield a total perception of risk score which can potentially range from 3 (no risk) to 12 (high risk). No reliability or validity estimates are provided for this index.

Procedures

The archival data collected from the survey will be obtained from the administration at the University of Oklahoma. Procedures involved in the survey process will be briefly reviewed. After the course enrollment list for the randomly selected courses had been obtained for the University of Oklahoma administration, instructors were contacted and asked if they will allow the survey to be distributed in their class. Surveys were distributed at the beginning of class and then collected at the beginning of the next class two days later. Students participating in the survey were provided with a written description of the study, its purpose, and its relevance to drug and alcohol use on campus. Informed consent was assumed through the completion and return of the instrument. Participants were asked to only return the completed instrument with no

identifying information added. With informed consent being met by the returning of the materials, participants were guaranteed complete confidentiality. This part of the protocol was added based on the results of a pilot study.

Students were allowed to sign a piece of paper verifying their participation if they chose to. This allowed them the opportunity to receive credit from instructors who already give credit to student for research participation on campus. This list was only signed after the participant had turned in their instrument. At no time was this list and the survey stored together. This procedure guaranteed students' confidentiality, while allowing the instructor the flexibility of awarding credit for participation.

Data Analysis

The data collected from this investigation will be analyzed using the Statistical Package for the Social Sciences (SPSS®) for Macintosh®. After the database has been verified for accuracy, descriptive statistics will first be calculated. These will include measures of central tendency and dispersion (e.g., M and SD), frequencies, percentages, and cross-tabulations of variables (e.g., response by gender).

Because the hypotheses in this investigation focus on the ability for various factors to predict drinking behavior among undergraduate college students, the hypotheses will be analyzed using canonical correlation analysis. This analysis is appropriate because the goal is to examine the relationship between two sets of variables (i.e., attitudes and alcohol behavior). The canonical variate (i.e., the linear combination of the variables), for the outcome variable will be drinking behavior, which will comprised of the variables in the drinking behavior index. The canonical variate for the independent side of the equation will include the personal (H1a), friends' (H1b), and

others' (H1c) attitude variables and the friends' (H2a) and others' (H2b) drinking norms variables, all of which will be entered simultaneously. The significance of the canonical variable loadings will be evaluated at .05, as will the squared multiple correlations of each variable. The inspection of these coefficients will allow for the specific testing of the first research question in that they will reveal which of the predictors are uniquely predictive of drinking behaviors and which is the strongest predictor.

To test Hypothesis H2c, which predicts that actual drinking behavior will be more closely related to perceptual norms of friends' drinking levels than to perceptual norms of others' drinking levels, a test of dependent correlations will be calculated between the following two semi-partial correlations: (a) drinking behavior with friends' norms and (b) drinking behavior with others' norms. The resulting t value will be evaluated at a two-tailed alpha of .05.

The assumptions underlying canonical correlation (i.e., linearity, homoscadasticity, and multivariate normality) will be examined by visually inspecting the distribution of canonical variate scores and by producing a scatterplot of pairs of canonical variates (Tabachnick & Fidell, 1996). If the data are not multivariate normal, then data transformations will be conducted on variables with non-normal distributions in an attempt to normalize them. Tolerance values will be used to examine for the presence of multicollinearity and Cook's distance scores will be inspected to evaluate for influential outliers.

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