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COMPARING PATTERNS OF ALCOHOL USE IN FEMALE ATHLETES AND THEIR TEAM CAPTAINS IN INTERCOLLEGIATE SOFTBALL TEAMS

By

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ABSTRACT

COMPARING PATTERNS OF ALCOHOL USE IN FEMALE ATHLETES AND THEIR TEAM CAPTAINS IN INTERCOLLEGIATE SOFTBALL TEAMS

By

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The purpose of this investigation was to examine the patterns of alcohol use between captains of college softball teams and their teammates. Participants were 618 female intercollegiate softball players ages 18-23 (M = 19.83). Athletes completed the Core Alcohol and Drug Survey (Presley, Leichliter, & Meilman, 1998). Four questions were asked in regards to alcohol use among the teams: (a) Do team captains use less alcohol and binge drink less than their teammates? (b) Does captains' alcohol use predict the alcohol use of other members on their teams? (c) Does a coach's emphasis on alcohol policy adherence predict the alcohol use of the non-captains on their teams? (d) Does a team's additional alcohol policy predict the alcohol use of the non-captains on the team representing that institution? Alcohol use was operationalized as an index score that was constructed from the average number of drinks consumed in the past week, the number of times there were five or more drinks consumed in one sitting over the past 2 weeks, the amount of alcohol consumed in the past year, and the number of drinks consumed within the past 30 days. Binge drinking was operationalized as consuming five or more drinks in one sitting. Coaches' emphasis was measured by how many times the coaches talked to their teams about adhering to an alcohol policy. Teams' additional alcohol policy was examined by distinguishing teams that had an added alcohol policy from just their institution's policy regarding alcohol use. Results showed that there was very little

difference in the pooled captain scores of alcohol use and the collective scores of team members' alcohol use. Using Hierarchical Linear Modeling (HLM), results showed there was a moderate relationship between captains' alcohol use and their teammates alcohol use. However, no relationship between coach's emphasis of adhering to an alcohol policy and their team's alcohol use. There was a slight relationship between a team's additional alcohol policy and the team's alcohol use.

DEDICATION

To my husband Mark, and my sons, Emmett, Carson and Tanner with love

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GLOSSARY

Operational Definitions and Abbreviations

Alcohol Use: An index score created by measuring four components of drinking patterns: having five or more drinks within the past 2 weeks of completing the survey, average number of drinks consumed in the past 30 days, frequency of alcohol use within the past year, and number of drinks consumed in the past week.

Athlete: Division III college softball players from the Midwest.

Binge Drinking: Drinking five or more alcoholic drinks within the previous 2 weeks of completing the survey.

Captain: Softball player who was either elected by her teammates and/or appointed by his/her coach.

Coach's Emphasis: The score given by athletes of how many times a coach talked about obeying an alcohol policy.

CAS: Harvard School of Public Health College Alcohol Study

CDC: Centers for Disease Control and Prevention.

CORE: Core Alcohol and Drug Survey, Southern Illinois University

Dangerous Drinking: Another term used for binge drinking.

Formal Peer Leader: Captain

Frequent Episodic Drinking: Binge drinking three or more times within the previous 2 weeks.

Heavy Episodic Drinking: Another term used for binge drinking.

Informal Leader: Athletes on the team who demonstrate leadership qualities but are not

in a formal leadership position.

MTF: Monitoring the Future, University of Michigan

NCHRBS: The National College Health Risk Behavior Survey (CDC).

NHSDA: The National Household Survey on Drug Abuse, Substance Abuse and Mental Health Services Administration (SAMHSA).

NIAAA: National Institute on Alcohol Abuse and Alcoholism

Non-captain: Members of the softball team who were not a captain.

Prevalence Rate: Term used in the alcohol research to define the incidence rate of alcohol use within 1 year.

SAMHSA: Substance Abuse and Mental Health Services Administration.

Team's Additional Alcohol Policy: A policy of alcohol restrictions or rules that teams or coaches create in addition to the institution's alcohol policy.

Chapter 1

INTRODUCTION

Nature of the Problem

Research has shown that there is an enormous effect that alcohol has on the college population. In fact, experts have labeled the widespread misuse of alcohol as one of the most serious threats to our nation's institutes of higher education (Higher Education Center, 1997). Researchers have examined the prevalence of drinking patterns of college students as well as identified some of the unique variables that make the college population more vulnerable to alcohol problems than other subgroups. There are certain subgroups of college students who are more at risk than the general college student population including members of the Greek system and athletes (Cashin, Presley, & Meilman, 1998; Presley, Meilman, & Lyerla, 1993; Wechsler, Dowdall, Davenport, & Castillo, 1995a). Furthermore, trends in drinking show excessive drinking by female college students is on the rise (Keeling, 2002). Despite the extensive lines of research regarding alcohol use in the college population, there has been little done on the relationship between alcohol use and the college athlete.

The research that has been examined on alcohol and athletes has merely found general statistics comparing alcohol use by athletes vs. non-athletes with the addition of sparse studies relating alcohol and athletes with gender, injury, performance, different sports, and medical concerns. There has been no research examining alcohol patterns within a team or group and how different variables such as social components within a team's environment might affect group members' alcohol use. Furthermore, research has

not explored the relationship between athletes holding leadership positions, and their teammates, within each team in regards to alcohol use.

There is a growing need for the intervention and education of college student alcohol misuse and abuse. In particular, college athletes are in a unique culture when it comes to the pressures of excessive alcohol use. Many students and student-athletes are unaware of the long-term consequences of their lifestyle choices pertaining to alcohol consumption. In order for the most effective intervention strategies or prevention plans to be created, it would be important to not only understand what the problem is among college athletes and the misuse of alcohol, but to examine the unique variables that play a part in the college athlete's life that influences excessive alcohol use. Once those variables are understood and researchers have some answers to why college athletes are more at risk, then proper strategies can be implemented to help reduce the misuse of alcohol among the college-athlete population. More research studies within the sport setting are needed to examine the unique culture of being a part of a team and how different components within a team can affect a person's choices in regards to alcohol use.

The purpose of this study is to determine whether the drinking patterns of female athletes in formal leadership positions (i.e., team captains) differ from the drinking patterns of the other members on their team. Additionally, the relationship between female team captains' alcohol patterns and their team members' alcohol patterns within each team will be examined. This chapter provides a general overview of research on alcohol and its relationship to the college student population and the college athlete population. In addition, a brief summary is presented of the research examining social

learning theory applied to peer influence in alcohol use among college students, as well as a conceptual background of peer leadership in regards to sport.

Alcohol and the College Student

Research on alcohol consumption of college students has increased over the past few decades. This research has focused on prevalence rates, demographic characteristics of alcohol users and nonusers, and the consequences of drinking among college students. Data show that annual prevalence rates of drinking are 82 -85% among college students (Johnston, O'Malley, & Bachman, 1994; National Institute on Drug Abuse, 1991; Presley, Meilman, & Cashin, 1996a; Tricker & Cook, 1989). Prevalence rates are defined as the incidence rate of alcohol use within 1 year. This high percentage rate of alcohol use by college students within a 1-year period is not a major concern because it tells very little about the quantity and frequency of alcohol consumed by college students within a year. Furthermore, it does not suggest any findings about the misuse of alcohol other than reporting under-age drinking. More of a concern is the problematic, "heavy episodic drinking" or "binge drinking" because it is this kind of drinking that causes most of the harm associated with alcohol. The harm associated with alcohol misuse is associated with the quantities consumed during a drinking occasion more than by the frequency of drinking (Rehm et al., 1996).

Wechsler and his colleagues coined the term "binge drinker" and refined the concept to categorize students whose drinking comprised of four or more drinks for women and five or more drinks for men at one sitting (Wechsler & Austin, 1998; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994; Wechsler, Lee, Kuo, &

Lee, 2000). The literature has also used similar terms to refer to binge drinking that include heavy drinking, dangerous drinking, excessive drinking, heavy episodic drinking and episodic drinking. Although binge drinking is a term that has been widely used as a "catch word" to designate college drinking that leads to serious problems, there is acknowledged criticism of the term (DeJong, 2001; Goodhart, Lederman, Stewart & Laitman, 2003; Gruenewald, Johnson, Light, Lipton & Saltz, 2003; Jung, 2003). Binge drinking is the term that is used in the present study because of its widespread use in the literature.

One of the most noted surveys of college alcohol use and its misuses was conducted by the Harvard School of Public Health College Alcohol Study (CAS) in which Wechsler and his colleagues surveyed a random sample of the college population in 1993, 1997, 1999 and 2001. The results of the CAS, using over 140 colleges, found that binge drinking among college students did not change between 1993 and 2001. Rates of binge drinking stayed consistent between 40 - 45% within the last 2 weeks of the survey (Wechsler, Lee, Kuo, and Lee, 2002). In addition, other research has shown college students have been found to drink frequently and binge drink at similar rates (Leichliter, Meilman, Presley, & Cashin, 1998; Presley et al., 1996; Werner & Greene, 1992).

In another national survey from the Core Institute at Southern Illinois University, Presley and his colleagues surveyed a national sample of college students every year between 1990 and 1994 and found 45.6% of full-and part-time students at 2 and 4 year institutions engaged in binge drinking over the previous 2 weeks (Presley et al., 1998). In the latest (1994) survey, over 45,000 students participated.

Although Wechsler et al. (2002) did not find binge drinking rates to change between 1993-2001, others found an actual increase in the prevalence rates of annual abstainers of alcohol between 1993 (16%) to 2001(23%) for a difference of 7% (Knight, Wechsler, Kuo, Seibring, Weitzman, & Schuckit, 2002). There has been a decline in the percentages of college students who have taken a drink within the past 30 days between the years 1982 (83%) to 1999 (70%) by 13% (Johnston, O'Malley, & Bachman, 2000). However, the 2001 CAS (Wechsler et al., 2002) data showed more drinking in excess on measures such as frequency in drinking, frequency in drunkenness, and frequency of drinking to get drunk than from the previous data. These trends show that more students are choosing not to drink alcohol but those that are drinking are binge drinking the same or more frequently.

Gender Differences in Alcohol Use

Overall, statistics show that female college students drink less than male college students (Everett-Jones, Oeltmann, Wilson, Brener, & Hill, 2001; Johnston et al., 2000: Keeling, 2002; Wechsler et al., 2002). Rates are more similar in regards to monthly alcohol use (73% for males, 67% for females) but the difference expands as frequency and quantity of alcohol increases (Johnston et al., 2000). Binge drinking rates in males have been reported to range from 47-52% while in females rates have been reported to be from 33- 35% (Everett-Jones et al., 2001; Johnson et al., 2000: Keeling, 2002; Wechsler et al., 2002). Keeling's (2002) examination of the literature of the five major data sets, concluded that the gap between gender in regards to heavy drinking is narrowing as female heavy drinking is on the rise. Female college student alcohol use is another area

of research that needs more attention. While there have been some studies that differentiate statistics by gender, there needs to be more information to access reasons why female binge drinking is increasing and to identify the unique variables that are specific to both men and women regarding alcohol abuse in college.

Alcohol and the College Athlete

Alcohol and sport seem to go hand-in-hand: tail-gating before games, alcohol sales in venues, sports bars, and celebrating victories with champagne. The alcohol industry plays a major role in this relationship. It is estimated that the average child views as many as 100,000 beer ads before reaching the legal age for drinking alcohol (Gloede, 1988).

The economic impact of alcohol on sports cannot be overstated. According to Top TV Sports Advertisers (1988), Anheuser-Busch spends two thirds of its advertising budget on sports. In addition, the same company will sponsor, in broadcast television, radio, and/or cable, 23 of the 24 domestic Major League Baseball teams; 18 of the 28 clubs in the National Football League; 22 of the 23 National basketball Association franchises; 13 of 14 domestic National Hockey League teams, and 9 of 11 Major Indoor Soccer League clubs. Anheuser-Busch also sponsors over 300 college teams (Gloede, 1988). There is no question that a symbolic relationship exists between the alcohol industry and sport. Unfortunately, the athlete falls in the center of that relationship: the athlete that is deemed—the role model (Wadler & Hainline, 1989).

Not only do the media and alcohol companies impact college athletes, there have been several other areas identified by research concerning the unique culture that athletes

live in, that might contribute to alcohol use. Because of their dual role of being student and athlete, some may feel an enormous amount of pressure and stress (Parham, 1993; Watson, 2002). These stressors may include balancing academics and athletics, feeling pressure to please many people including coaches, teammates, professors, school officials, friends, relatives, fans and the media, and having an elevated status around campus. For some athletes, alcohol consumption can be a way of relieving the stress they are faced with on a daily basis (Archer, 1991; Archer & Cooper, 1998).

Another unique factor regarding college-athletes is the social environment (Nelson & Wechsler, 2001). Athletes were found to be more likely than what non-athletes to exhibit several social factors that have been linked to the increased risk of binge drinking. These factors include: reporting that athletes have five or more close friends than what non-athletes reported, placing a higher level of importance on parties as compared to non-athletes, and spending at least 2 hours more per day socializing than non-athletes. One reason for this unique social environment was reported by Stainback (1997) who found that student-athletes were overly exposed to social settings that promote alcohol use which include traveling frequently and engaging in social settings with alumni and sports boosters.

College athletes also, in general, have been found to be higher risk-takers than college non-athletes (Bakker, 1996; Nattiv & Puffer, 1997). These risk-taking behaviors include not using seatbelts, not wearing helmets when riding motorcycles, mopeds or bikes, driving while under the influence of alcohol, riding in a car operated by a person under the influence of alcohol, getting in physical fights, having multiple sexual partners, not using contraception, and drinking heavy amounts of alcohol. Surprisingly, few

researchers have examined the association between intercollegiate athletics and drinking. In one of the classic studies, Straus and Bacon (1953) used 15,747 students from 27 colleges. Researchers suspected that because athletes would strive to maintain top physical fitness and because they would be more disciplined and have less time to socialize, they would be less likely to drink than non-athletes. Data revealed 87% of male athletes used alcohol compared with 75-78% of all other male students. Of women athletes 60% were found to drink alcoholic beverages as compared with 48-56% of all other female students (Straus & Bacon, 1953).

In very few studies, athletes were found to be less likely to drink alcohol (Kokotailo, Henry, Koscik, Fleming, & Landry, 1996; Koss & Gaines, 1993). But for most of the previous research, dating back to the 1980s and early 1990s, researchers have shown that participation as a student-athlete showed no differences in alcohol use (88-92% annual prevalence rate) than the general college population (Anderson, Albrecht, McKeag, Hough, & McGrew, 1991; Anderson & Snellman, 1986; Duda, 1984; Gay, Minelli, Tripp, & Keilitz, 1990; Toohey, 1978; Toohey & Corder, 1981).

Alcohol use did not differ significantly between athletes and non-athletes in a study of students from two state universities and two private colleges (Overman & Terry, 1991). However, they found evidence that drinking patterns may vary between athletes and non-athletes. They suggest that male non-athletes drink significantly more during the week than male athletes, who tended to drink more on weekends or special occasions. Also, athletes reported drinking more beer than non-athletes, perhaps reflecting influences of the marketing strategy of beer distributors or traditional values associated

with participation in sport. These findings were consistently replicated until the latter part of the 1990s when trends in the data of student-athletes started to shift.

The research since the late 1990s to the present has shown that "athletes are as likely, and in many instances more likely than the general student population, to engage in deleterious alcohol consumption" (Leichliter et al., 1998, p. 257). Other studies supported the research that athletes consume more alcohol than the general student population (Leichliter et al., 1998; Nelson & Wechsler, 2001; Wechsler, Davenport, Dowdall, Grossman & Zanakos, 1997).

Interestingly, trends in the data show a drop in the prevalence of college athletes using alcohol while that of binge drinking increased. In other words, there are more athletes abstaining from alcohol but the athletes who are drinking alcohol are consuming it in greater frequency and quantity (Green, Uryasz, Petr, & Bray, 2001). It is because of the harmful consequences to not only the student-athletes and non-athletes that are engaging in heavy episodic drinking, but also to the entire college population that college administrators and government officials are concerned about these trends.

Although studies on prevalence rates between athletes and non-athletes may be equivocal, researchers generally support the fact that athletes are increasingly engaging in binge drinking. Binge drinking rates among athletes increased from 36-43% between the years 1985-1989 (Michigan State University, College of Human Medicine, 1989). Wechsler et al. (1997) found 61% of the males involved in athletics (students who spent 1 or more hours per day in intercollegiate sports and thought participation in athletics was important) engaged in binge drinking while 55% of those partly involved in athletics (students who spent 1 or more hours per day in intercollegiate sports or thought

participation in athletics was important) binge drank within the previous 2 weeks of the survey. Women's results were similar with 29% of male athletes and 24% of female athletes engaged in binge drinking three or more times within the past 2 weeks compared to 18% of male non-athletes and 15% of female non-athletes. The authors found the more one was involved in athletics the higher the binge drinking.

Similarly, Leichliter et al. (1998) used data from 51,483 students at 125 institutions and found binge drinking rose for men and women as the degree of athletic involvement increased. For men, 45% of non-participants' were binge drinkers, 61% of athletes (non captains) were binge drinkers and 64% of athletic team leaders (captains) were binge drinkers. For women, the binge rates were 31, 47 and 49% for non-participants, team members, and team leaders, respectively.

In the most recent research published, Nelson and Wechsler (2001), using 12,770 college students from 130 colleges and universities, reported athletes binged at higher rates than non-athletes. Among the male students, 57% of athletes reported binge drinking at least once during the previous 2 weeks compared to 49% of the non-athletes. Among the female students, 48% of the athletes reported binge drinking while 40% of the non-athletes binge drank.

Overall, male and female athletes show equal annual prevalence rates with alcohol consumption, but male athletes tend to drink more often and binge drink more than female athletes. The percentages of binge drinking among male collegiate athletes range from 57- 61% while women collegiate athletes range from 46-50% (Leichliter et al., 1998; Nelson & Wechsler, 2001; Wechsler et al., 1997). In addition, Wechsler et al.

(1997) found 21% of the male athletes drank to get drunk compared to 12% of women athletes.

Alcohol and Athlete Leadership

The risks and problems associated with alcohol use in college athletics will not be adequately addressed by focusing only on student athletes. Attention must also be given to the role of positive leadership for enhancing the health and total well-being of athletes. There has been very little research conducted on team leaders and alcohol. Such research would allow us to discover whether or not leaders tend to act more or less responsibly and if the team's leaders' alcohol patterns have a positive or negative relationship to the other team members' drinking patterns. Carron (1980) found the role of athletic leadership is a significant factor in the life of a student athlete. In a study that examined differences in alcohol use and consequences of use according to the leaders vs. the other team members, Leichliter et al. (1998) found no support for the hypothesis that athletic leaders were more responsible than other team members in using alcohol. The study used 58,453 students from 125 colleges across the United States who participated in Core Alcohol and Drug Surveys between 1994 and 1996. In fact male team leaders consumed more alcohol, binged more often, and suffered more consequences than other team members. Female team leaders, however, showed no differences from other team members.

While the Leichliter et al. (1998) research helps shed some light on the patterns of alcohol use among athletes in leadership roles as compared to the general athlete population, it fails to examine how each leader's behavioral patterns might influence

his/her team members' alcohol use patterns because it did not consider the inherent nesting involved with team captains and their team members. In order to examine if the alcohol use of team captains predicts the alcohol use of their respective teammates, the nesting of athletes within teams must be considered.

The topic of leadership has been heavily researched in the educational and business literature but remains one of the least understood concepts (Todd & Kent, 2004). Even while researchers can not agree on a consensus regarding the definition of leadership, Chelladurai (1999) has synthesized this complex term as follows: "All definitions of leadership imply three elements: (1) leadership is a behavior process, (2) leadership is interpersonal in nature, and (3) leadership is aimed at influencing and motivating members toward group goals" (p. 160). There have been a limited number of research studies that have stressed the importance of leadership (Meindl, 1990; Pfeffer, 1977) but most have ascertained that leadership is a crucial and distinct aspect of organizations and groups (Bass, 1990; Bennis, 1989; Kouzes & Posner, 1995).

Because leadership is important to the success of many different organizations whether it be corporations, schools or athletic teams, it is important to understand its intricate structure and development. By nature, groups consist of individuals who work together to achieve goals that are both interpersonal and task-oriented. Kozub and Pease (2001) state that the primary function of a leader is to influence members of the group and help facilitate the achievement of the group's goals. Bennis (1989) emphasizes that leaders are responsible for the effectiveness of groups and that they provide integrity to institutions. Leadership can come from any member of the team. According to Mabry & Barnes (1980), leadership roles are labeled within a team as either formal or informal.

Formal leadership is set apart from the group and is included in the organizational structure. The coach and team captain would represent formal roles of leadership. Informal leadership emerges over time as individual members of the group interact and spend time together. The informal leader might be a star player or a veteran player who might have significant influence within the group members. Informal leadership can have as much influence on the group, and sometimes more, compared to formal leadership (Mabry & Barnes, 1980).

In support for the formal and informal leadership types, there is a small body of literature that has recently dealt with peer leadership among adolescents regarding risk-taking behaviors. While these studies have primarily used subjects that are of middle-school and high-school age, it would be erroneous to overlook what researchers have found. Luthar and McMahon (1996) found two contrasting patterns of admired, well-liked teens. The first group was characterized by conventionally valued behavior such as academic achievement and prosocial behavior. The second group was characterized by disruptive/aggressive behaviors and school performance. In a similar study, Rodkin, Farmer, Pearl and VanAcker (2000) found two types of boys that were well-liked by their peers, popular-prosocial boys and popular-antisocial boys. Each group rated themselves as "cool" and athletic while the popular-prosocial group added the characteristics of nonaggressive and academically competent; the popular-antisocial group rated additional characteristics of aggressive. Both groups were well-liked and recognized as central figures within their peer groups. Miller-Johnson, Costanzo, Coie, Rose, Browne and Johnson (2003) found that a more unconventional peer group leader may be influential in promoting norms that support involvement in risk-taking behaviors. The research team

concluded that reaching adolescents through peer leaders, including the use of more unconventional controversial status peers should be considered and may have the most impact to changing substance use patterns.

Data from alcohol research support that the best avenue for influencing athletes' decisions regarding substance use is through peers. Additionally, peer leaders who reinforce drug-free behavior acts as the best prevention strategy over other traditional strategies such as social norms or educational programs (Elder, Barnes, Leaver-Dunn, Nagy, & Leeper, 2002). Fitzgerald and Ardnt (2002) strongly encourage prevention programs not only to focus on peer disapproval of drinking alcohol but also the disapproval from students in school, parents, and the community for the most impact. Unfortunately, very little if any research is being conducted in this area for the college athlete population.

Almost all of the research related to leadership in sport has focused on the formal leader—that of the coach. Although these studies have examined self-reported leadership styles and preferred leadership behavior by athletes (e.g., Chelladurai & Saleh, 1980), none have examined coaches' leadership behavior and alcohol use by athletes. Research that focused on peer leadership is even more sparse than coach leadership research. The importance of leadership among group members has had many schools and sports organizations identify it as a desire to develop peer leadership in future goals (Sage, 1973). Many times one can hear coaches calling for their athletes to lead their team. Despite this hypothetical importance, sports psychologists have largely ignored peer leadership. Not only does there need to be more studies to identify how peer leaders develop or emerge but even more importantly, research is needed on how player or peer

leadership can influence members of the team in regards to performance or social behaviors.

Previous research suggests there are four social environments (peer, school, home and neighborhood/community) that directly impact adolescents' drinking behavior (Bahr, Marcos, & Maughan, 1995; Mason & Windle, 2001; Ouellete, Gerrard, Gibbons, & Reis-Bergan, 1999). In fact, studies that were designed to assess the significance of each of these four areas found peer attributes and influence to have the most influence on adolescents (Beal, Ausiello, & Perrin, 2001; Fitzgerald & Arndt, 2002; Jenkins, 1996; Olds & Thombs, 2001; Urberg, Degirmenciouglu, & Pilgrim, 1997).

Because peer attributes are shown to have the most influence on adolescents' substance use and because athletes spend many hours within the same peer group, it is speculated that the peer leader has a major influence on other members of his/her athletic team on substance use patterns. Although, the literature involving adolescents indicates that being a member of a group, particularly an athletic team, is a protective factor against health risk behaviors, including preventing substance abuse, that may not be the case for alcohol use (Pate, Heath, Dowda, & Trost, 1996; Page, Hammermeeister, Scanlan, & Gilbert, 1998; Pate, Trost, Levin, & Dowda, 2002; Rainey, McKeown, Sargent, & Valois, 1996; United States Department of Health and Human Services (DHHS), 2002; Winnail, Valois, McKeown, Saunders, & Pate, 1995). Pate et al. (2002) found that adolescents involved in sports were significantly less likely to smoke cigarettes and marijuana but did not find the same correlation for alcohol. One explanation for this finding is our culture's acceptance of alcohol use through the media especially in relationship with sport.

These studies primarily involved adolescents in middle and high schools. Given the fact that by the time athletes are attending college, substance abuse rates in athletes are exceeding that of their non-athlete peers the following questions can be raised: What makes the environment of athletics in college different and more prone to alcohol abuse? What influence could peer leaders have within their athletic teams in regards to alcohol use? The present study is an attempt to start the process of examining some of the variables within teams that affect alcohol use, specifically the relationship between the formal team leader and members of his/her team.

The sport chosen for the current study was collegiate softball teams. There was nothing specifically intrinsic to the nature of softball for using this sport in the study other than the fact that the investigator had access to softball coaches at the Division III level as well as the need for more research on female athletes and alcohol use.

Exploratory Questions

Specifically, the following research questions were examined:

1. Do team captains use less alcohol and binge drink less than non-captain athletes?
2. Does captains' alcohol use predict the alcohol use of the other members on their teams?
3. Does a coach's emphasis on alcohol policy adherence predict the alcohol use of the non-captains on their teams?
4. Does a team's additional alcohol policy predict the alcohol use of the non-captains on the team representing that institution?

Basic Assumptions

The study was conducted based upon several assumptions. First, it was assumed that the sampling technique used for this study was appropriate. Secondly, it was assumed that the administration of the questionnaire provided consistency of measurement. Next, there was an assumption that the subjects answered all the questions honestly. Finally, the study was conducted with the assumption that the Core Alcohol and Drug Survey questionnaire was a reliable and valid instrument for measuring college athlete alcohol patterns.

Delimitations

The study was delimited to Division III softball players in the Midwest. Results cannot be generalized beyond this population. It should also be stated that the results should be interpreted with caution for other levels of these teams including club, junior or senior high school or elite players.

Limitations

The present study is based on subjects' self-reports. Some athletes may misrepresent their leadership roles. Some athletes may also misrepresent sensitive information about their substance use and involvement in illegal acts, such as drinking under the legal age or damaging property. To help reduce this from occurring, the surveys were anonymous while providing the respondents with adequate protection.

Chapter 2

REVIEW OF LITERATURE

Introduction

Alcohol and its related risks have become a major concern in society. One population affected greatly by alcohol is the college student. College life offers opportunities for individuals to experiment with, and in some cases, abuse alcohol and other drugs. Not surprisingly, alcohol consumption by college students has been the focus of attention during the past few decades. Student-athletes are not immune to these findings. Recent research has shown that "athletes are as likely, and in many instances more likely than the general student population, to engage in deleterious alcohol consumption" (Leichliter et al., 1998). The problem continues, despite more educational programs directed at student athletes and stricter rules by coaches and universities as well as expanded use of drug testing.

This literature review will examine the relationship between alcohol use and college students including the five national data sets that have examined college alcohol use, trends of use, gender differences, factors affecting student drinking and the consequences of college alcohol use. This review will also cover the area of peer influence on college alcohol use and discuss prevention strategies that have been researched. In addition, the literature review will examine one subgroup of college students— student athletes. Specifically, student athletes and alcohol use including the literature on athletes as risk-takers, athletes' patterns of use, alcohols effect on performance, gender differences, peer leadership and alcohol use, differences in college divisions, and prevention efforts.

Finally, alcohol has been shown to have a direct link to many of the other risk behaviors of college athletes. Because alcohol plays such an integral part in these behaviors, it is important to include research pertaining to risk behaviors of college students and student-athletes. Some of these behaviors include driving while under the influence of alcohol or drugs, sexual intercourse without using condoms, property damage, sexual assaults, consideration of suicide, attempted suicide and more. It is for these reasons that more research needs to be conducted to better understand the broad scope of alcohol in the college population—including athletics. This review will conclude with a discussion on the limitations of the research, suggestions for future research and a discussion on future prevention of the abuse of alcohol by college athletes.

Alcohol and College Students

Research indicates that alcohol is the most commonly used drug on college campuses with annual prevalence rates of approximately 82-85% (Johnston et al., 1994; National Institute on Drug Abuse, 1991; Presley et al., 1996b; Tricker & Cook, 1989). In addition, college students have been found to drink frequently and binge drink often (Leichliter et al., 1998; Presley, Meilman, Cashin & Lyerla, 1996b; Werner & Greene, 1992). Much of the research findings have come from large, national data sets on college student drinking.

Five National Data Sets on Alcohol Use By College Students

There are five key national sources of data that have been collected regarding alcohol consumption among the college student population. Each of these sources has

conducted their research with slightly different characteristics related to their population, data collection methodology, instrumentation, and period of data collection. These five data sets are:

1. The Harvard School of Public Health College Alcohol Study (CAS) (Wechsler et al., 2002);
2. The Core Institute (Core), Southern Illinois University (Presley et al., 1996a; Presley et al., 1996b);
3. Monitoring the Future (MTF), University of Michigan (Johnston et al., 2000);
4. The National College Health Risk Behavior Survey (NCHRBS), Youth Risk Behavior Surveillance, Centers for Disease Control and Prevention (CDC) (Centers for Disease Control and Prevention, 1995);
5. The National Household Survey on Drug Abuse (NHSDA), Substance Abuse and Mental Health Services Administration (SAMHSA) (National Institute on Drug Abuse, 1991).

In the CAS study, funded by the Robert Wood Johnson Foundation, the principal investigator (PI), Henry Wechsler and his colleagues conducted their survey over four different years—1993, 1997, 1999, and 2001. All of these surveys were distributed to the same colleges over the span of the four surveys. In 1993, 140 randomly selected, four-year colleges participated. The complete 20-page, mailed questionnaire was completed by 15,103 students (response rate of 69%). In 1997, 14,521 students (response rate of 60%) from 116 colleges completed surveys. In 1999, 14,138 students from 128 colleges participated (response rate of 60%). In 2001, 10,446 students (response rate of 53%)

from 114 colleges participated (Wechsler, 2003). The advantages of the CAS study include large sample sizes which allow for subgroups to be identified, institution-level variables can be examined and analyzed, repeated surveys to study change over time and samples are randomly selected allowing the findings to be generalized to suggest national estimates.

The PI for the CORE Survey was Cheryl Presley. The CORE was funded by the Drug Prevention in Higher Education Program of the Fund for the Improvement of Postsecondary Education of the U.S. Department of Education. The CORE Survey was specifically designed for use with college students and the institutions participated on a voluntary basis, so the sample was not randomly selected. More than 45,000 students participated in the study's fourth cycle, a period that covered 1992 to 1994. CORE's major advantages include large sample sizes, information about institutions, and respondents grouped by institution, so institutional variables and policies could be examined, and the inclusion of other drugs.

The MTF's primary investigator was Lloyd Johnston and was funded by a series of grants from the National Institute on Drug Abuse. The study conducted annual nationwide surveys of about 17,000 high school seniors, with annual follow-up surveys of representative subsamples from all previously participating senior classes. There were no colleges represented so no conclusions can be drawn from individual institutions. The advantages of MTF are: availability of relatively long-term trend data, the study is ongoing, the design is longitudinal including the transition period between high school graduation and college, and the design includes both college students and same-age peers who do not attend college, so comparisons between the two groups can be drawn.

The NCHRBS was a one-time study conducted between January and June of 1995 by the Division of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion. More than 4,800 students from 136 colleges which were relatively proportional of Black and Hispanic students, completed the questionnaire. The major advantages of this sample include comparisons across ethnic groups, and data on several health risk behaviors in addition to alcohol and drug use.

The NHSDA was conducted under government contract by the Research Triangle Institute. This survey was conducted by using in-home interviews. The study included more than 4,800 part-time and full-time college students and more than 7,000 respondents of college age (17 to 22) defined as non-college students. The major advantages of NHSDA are the study is on-going, comparing both college students and same-age peers who do not attend college and a broad range of substance-abusing behaviors is represented.

All of these sources identified extraordinarily high percentages of excessive drinking. Findings from the five sources agreed that approximately two of three U.S. college students participate in heavy episodic drinking (Wechsler & Austin, 1998). MTF data showed a 70% prevalence rate of alcohol use within the previous 30 days among full-time college students, ages 19-22. The same data set showed that 40% of the college student sample binge drank within the previous 2 weeks. Therefore, more than half of the students who drank in the past 30 days (70%) had been drinking heavily in the previous 2 weeks (O'Malley & Johnston, 2002). CAS found prevalence rates of binge drinking to be at 44% in 1993 and 43% in 1997 and 45% in 2001 within the 2 weeks of the completed survey (Wechsler, Dowdall, Maenner, Glenhill-Hoyt, & Lee, 1998).

CORE reported binge drinking rates, defined in the same way as in the CAS study, at 38% in the 1992-1994 survey (Presley et al., 1996a). The NCHRBS found binge drinking rates to be 42% among college students (Everett-Jones et al., 2001).

In addition to the five key sources discussed, there are numerous other research studies that add important findings in the area of college alcohol use. College drinking is further reviewed using these five major data sources, in addition to other smaller data sets. It is noteworthy that the estimates of prevalence rate of drinking in all of the data sets are generally consistent with each other. This consistency suggests there is considerable validity to the high drinking rates of college students.

Trends of Alcohol Use

The MTF study was the only national research data that extended over more than 4 years. The trend for alcohol use (past 30 days) showed a decline with rates peaking at 83% in 1982, down to 70% in 1999—a 13% difference. Binge drinking showed a slightly smaller decline of 11% with reported heavy drinking at 29% in 1982, peaking at 45% in 1984 to 40% in 1999 (Johnson et al., 2000). Monthly prevalence rates have been compared from one of the first studies by Straus and Bacon (1953) to recent years. According to Blane and Hewitt's (1977) recalculation of Straus and Bacon's data from college students in 1949 to 1951, 65% reported drinking alcohol once a month or more. The monthly rates in the 1990's are slightly higher with rates in the MTF study (1995) to be 68% of full-time students, the CAS study estimated 70% and the NCHRBS reported 68% of all students (73% of full-time students) drinking at least once in the past 30 days. However, since 1953, there have been major changes in the demographics of college

students. There are higher proportions of females and ethnically diverse people attending college in the 1990's. There are also a lot more "non-traditional" students enrolled in college presently. Because of these differences, and the fact that males are much more likely to be frequent drinkers, the probability is high that there is a somewhat greater change (O'Malley & Johnston, 2002).

Between 1993-1999 CAS data concluded that overall rates of abstainers rose (16 % in 1993 to 19% in 2001) as well as the percentage of frequent drinkers (20% in 1993 to 23% in 2001) (Knight et al., 2002). Overall, there has been a modest increase of abstainers as well as a modest increase of binge drinkers from the CAS data through 2001 (Keeling, 2002). To put more simply, there are more college students choosing to not drink any alcohol but those that are drinking alcohol are drinking alcohol more frequently and in more quantity.

Gender Differences in College Student Drinking

The general consensus for alcohol rates found by almost all studies is higher for male college students than female college students. The gaps generally get wider as frequency and quantity goes up. In the MTF study in 1999, comparing drinking in the past month, 73% of male students consumed alcohol compared to 67% of female students for a difference of about 6%. However, 50% of male students reported having five or more drinks in one sitting at least once as compared with 34% of female students for a difference of 16% (Johnston et al., 2000). Using the NCHRBS data, Everett-Jones et al. (2001) indicated that 49% of males binge drank as compared to 34.8% of women. The CORE data reported that 26% of males consumed 10 or more drinks per week compared

to 10% of females, or two and a half times more for males. According to MTF data, trends in gender differences, particularly in regard to heavy drinking, include the difference in 1986 of 24% (58% males vs. 34% females) and a difference in 1999 of 16% (50% for males vs. 34% for females) (Johnston et al., 2000). According to the CAS studies, the trends in frequent binge drinking among female college students are substantially increasing (5% in 1993 to 12% in 2001) (Keeling, 2002).

Women need to be extra careful when it comes to how alcohol affects the body. They have a smaller quantity of a protective enzyme in the stomach to break down alcohol before it is absorbed into the bloodstream which causes them to absorb about 30% more alcohol into their bloodstream (White, Jamieson-Drake, & Schwartzwelder, 2002). This blood travels directly to the brain and leads to women becoming intoxicated much faster than males. Women will black out after consuming only half of the amount of alcohol men will drink. They also may be more susceptible to alcohol-induced memory problems when given the same amount of alcohol as men (White et al., 2002). These influences on the body could easily lead females to engage in risky behavior such as unprotected sex. They also may put themselves at risk of being victimized of attempted rape, assault, and rape.

Factors Affecting Student Drinking

Factors that affect student drinking include three major categories: living arrangements, college characteristics, and first-year students. In terms of living arrangements, drinking rates are highest among college students who are members of fraternities and sororities, followed by students living in on-campus housing (Presley et

al., 1996a, 1996b; Wechsler et al., 1998, 2000). Students who live with their families drink the least amount of alcohol (O'Hare, 1990; Wechsler et al., 2002). Colleges where there is more excessive alcohol use include those where Greek systems are dominant, schools with high profile athletic programs, and schools located in the Northeast (Presley et al., 1996a, 1996b; Wechsler et al., 1997, 1998, 2000; Werner & Greene, 1992).

Even though high school students who go on to college tend to drink less than their non-college going peers, college students will surpass their non-college peers by the first year in college (Schulenberg et al., 2001). Researchers found the first 6 weeks of a freshman's enrollment to college is the most critical time period for the risk of excessive alcohol. This can have a major impact on the successful transition to college, in fact, about one-third of first-year students do not enroll their second year (Upcraft, 2000).

Consequences of College Alcohol Use

One of the main concerns resulting from the more frequent, heavy drinking is the health consequences. In fact, the National Institute on Alcohol and Alcoholism (NIAAA) (2002) compiled results from most of the health studies conducted on alcohol use outcomes and concluded that the consequences both drinking and nondrinking students suffer due to alcohol use every year include: 1,400 college students die from alcohol-related causes (1,100 from drinking and driving), 500,00 students suffer injuries that are nonfatal, 400,000 students engage in unprotected sexual intercourse, more than 100,000 students do not remember if they gave consent for sexual intercourse, 1.2-1.5% of students attempt suicide as a result of alcohol and other drug use, 11% of students damage property, and 2.1 million students drive while under the influence of alcohol.

Health consequences are not the only harmful effects of alcohol use by college students. About 25% of college students report academic problems such as missing class, lower grades, doing poorly on tests or papers and falling behind as a result of alcohol use (NIAAA, 2002).

Not only are these harmful effects happening to students who are engaging in heavy episodic drinking, but also students who abstain from alcohol or who are moderate drinkers are experiencing negative consequences (this is referred to as secondary effects). Wechsler et al. (2002) found a number of secondary effects reported by students, living on campus or in sorority or fraternity houses, who abstain or drink moderately:

- 60.0% had study or sleep interrupted
- 48% had to take care of a drunken student
- 29% had been insulted or humiliated
- 20% of female respondents experienced an unwanted sexual advance
- 15% had property damaged
- 9% had been pushed, hit, or assaulted
- 1% of female respondents had been a victim of sexual assault or acquaintance rape

Alcohol has also been found to be the most significant factor in sexual aggression among male college students (Koss & Gaines, 1993). In addition, alcohol is a key contributor in rioting, hazing, and other forms of nonsexual violence, many of which occur in connection to sporting events (Axtman, 2002; O'Toole, 2002; Strauss, 2001).

Peer Influence on College Drinking

Researchers suggest four social environments, peers, the school, home, and community that influence adolescents' drinking behaviors (Bahr et al., 1995; Mason & Windle, 2001; Ouellete et al., 1999). Of all of these four variables, it is the peer environment that has proven to be the most influential on adolescents (Beal et al., 2001; Fitzgerald & Arndt, 2002; Jenkins, 1996; Olds & Thombs, 2001; Urberg et al., 1997). As adolescents get older they spend more time with their friends than they do with their parents (Csikszentmihaly & Larson, 1984), and as their peers become increasingly important, the more they are independent of parental control (Brown, Dolcini, & Leventhal, 1997). This process only intensifies in college especially for those students who leave home to live on campus. A major shift in influence from parents to peers occurs during the college years. Thus, college life makes for an ideal environment for drinking patterns to start and/or intensify.

Not only is the absence of parental control a key component in the importance of peer influence on individual attitudes and behaviors but also the amount of alcohol-based social opportunities at college that exist. College life is a time period for many students to live carefree before taking on the responsibilities of adulthood and a full-time job. Combining this carefree lifestyle with meeting new peers, some of whom will likely be drinkers given that four of five college students drink (Wechsler et al., 2000), creates a potential influence on drinking patterns in college. In addition, college students are more approving of alcohol use (Johnson, 1989).

In sum, peers play a considerable role in the development and maintenance of alcohol use in college students. Because college students are establishing a new peer

network, and immersing themselves in social activities (Martin & Hoffman, 1993), they encounter greater peer-drinking levels and alcohol-related behavior (Schulenberg, Bachman, O'Malley, & Johnston, 1994). Exposure to such environments has been correlated with increased levels of drinking especially for students living in places where "heavy drinking is approved and where alcoholic beverages and the places to consume them are readily available" (Schall, Kemeny, & Maltzman, 1992, p. 134). Thus, personal attitudes and behaviors in regards to alcohol consumption are related to peer alcohol-related attitudes and behaviors (Brennan, Walfish, & AuBuchon, 1986).

Literature on peer influence on college drinking patterns has been discussed primarily from social-cognitive theory. Peer influences are those interpersonal components present in the direct or potential drinking environment (Borsari & Carey, 2001). According to social-cognitive theory, peers can influence alcohol use by actively shaping drinking behavior or through more cognitively based social influence processes (Maisto, Carey, & Bradizza, 1999), which include three different variables: (a) active offers of alcohol, (b) modeling of others' drinking, and (c) perceived drinking norms.

For the purposes of this dissertation, the literature on peer influence on alcohol is examined for—direct (or active) peer influence which includes peers focusing on getting a student to drink and indirect (or passive) influences which include modeling and perceived norms (Borsari & Carey, 2001). Direct peer influence includes anything from polite gestures (e.g., offering to get a person a drink or buying a round) to command or persistent encouragement to drink (e.g., forcing a person to drink during drinking games). Indirect influences include what impact peers' drinking behaviors play as well as what

drinking behavior is acceptable and admired and what is expected behavior within a social setting that would lead to acceptance and reinforcement by a person's peer group.

In the area of direct peer influence, Wood, Read, Palfai, and Stevenson (2001) concluded that the number of direct offers of drinks had a positive relationship with alcohol use and problems. Conversely, not drinking at social events was found to be unusual behavior and could result in teasing and feelings of inferiority by peers. Using qualitative research, Rabow and Duncan-Schill (1994) had subjects keep a drinking diary for 28 days, subjects reported that not drinking was less common than drinking at social events and being without a drink caused several offers of drinks as well as comments. The researchers also found that refusal of drink offers led to exclusion from social events. Researchers indicated students who are more socially secure have better resistance to peer offerings of alcohol (Shore, Rivers, & Berman,1983) as well as socializing with an established group of friends. Furthermore, year in school had a positive correlation with refusing to drink alcohol (Klein, 1992). In other words, as college students advanced each year in college the better their refusal skills became.

In the area of indirect peer influence, the research on modeling and perceived norms has been the primary variables of interest. The term modeling has been interchanged with words like imitation and observational learning (White, Bates, & Johnson, 1991) and can be defined as "the temporary and concurrent imitation of another's behavior" (Borsari & Carey, 2001, p. 395). There have been several laboratory studies conducted in the 1970s and 1980s with modeling. A few of these studies are mentioned here, but because the scope of this paper does not focus on modeling as one of its primary foci, and because many of the studies found similar results, an overall

summary is presented for other research. In this type of laboratory research, the participant is first paired with another student who is actually a confederate trained to consume alcohol at a certain rate. A modeling effect is demonstrated if the subject's alcohol consumption matches that of the confederate. Overall, the research indicates that students exposed to heavy-drinking models consume more alcohol than students who were exposed to light-drinking models or no models at all (Borsari & Carey, 2001).

Research on modeling of alcohol indicates three characteristics of the model influence consumption. First, the participant matches the concurrent drinking behavior of the confederate not previous observation of him or her (Cooper, Waterhouse, & Sobell, 1979; Hendricks, Sobell, & Cooper, 1978). The models were also found to increase or decrease the subject's rate of consumption (Dericco & Garlington, 1977; Garlington & Dericco, 1977) as well as lead the participant in what kind of alcohol beverage to consume (Corcoran, 1995). Secondly, composition of a group of models influences participants' alcohol use. When there is a slow drinking confederate and a fast drinking confederate in the same group, participants will model the fast drinking confederate (Dericco & Niemann, 1980). In a large group setting, the subjects drank at the same rate as the majority rate of the confederates (Dericco, 1978). Third, modeling was influenced by the sociability of the confederate. Heavy drinking occurs when a heavy drinking sociable model is paired with a participant but not when paired with a light drinking sociable model. When confederates are unsociable both the heavy and light drinking confederates are associated with heavy drinking (Collins, Parks, & Marlatt, 1985). These findings support the coping role of alcohol in social learning theory (Maisto et al., 1999) by concluding that a participant may drink heavily in reaction to the negative

environment which may overwhelm the modeling effect of the confederate. Collins et al. (1985) found social status (popularity within a group) of the model to have no effect on the modeling effect.

Three participant characteristics were identified by researchers as influencing the modeling effect of alcohol use. Lied and Marlatt (1979) found heavy drinkers consume significantly more alcohol than light drinkers regardless of the modeling condition or gender of the subject. Secondly, participants with a family history of alcohol problems matched the confederate's drinking level more than those without such a history (Chipperfield & Vogel-Sprott, 1988). Finally, the gender of the participant influences modeling. Males consistently drank more than females, regardless of type of drinking confederate or history of drinking (Cooper et al, 1979; Dericco & Niemann, 1980; Lied & Marlatt, 1970).

Research in the second type of indirect peer influence is perceived norms. Because of the extensive research on perceived norms in the area of alcohol use, an overall review of the literature is discussed by providing general findings of perceived norms. Many studies, conducting survey research, found that the more the student perceived others as drinking heavily or approving of drinking the more personal use there was (e.g. Clapp & McDonnell, 2000; Liccione, 1980; Lo, 1995; Nagoshi, 1999; Perkins & Wechsler, 1996; Turrisi, 1999; Werner, Walker, & Greene, 1996). Furthermore, people-based norms, such as friends or parents, align more closely to personal drinking patterns than those of institutional-based norms such as governmental or health authorities (Nagoshi, 1999; Nagoishi, Wood, Cote, & Abbit, 1994; Wood, Nagoshi, &

Dennis, 1992). Gender differences showed that men perceive more permissive alcohol norms than do women (Adams & Nagoshi, 1999; Lo, 1995; Nagoshi et al., 1994).

Regarding descriptive norms studies, students have been found to overestimate the quantity and frequency of alcohol consumption of their peers, including close friends (e.g. Baer & Carney, 1993; Baer, Stacy, & Larimer, 1991; Banks & Smith, 1980; Larimer, Iruine, Kilmer, & Marlatt, 1997; Mooney & Corcoran, 1991) and typical college students (Baer, 1994; Baer & Carney, 1993; Canter & Kahnweiler, 2000; Perkins, Meilman, Leichliter, Cashin, & Presley, 1999; Thombs, 2000). Furthermore, researchers indicate that subjects believe others always drink more than themselves (Canter & Kahnweiler, 2000; Larimer et al., 2000). The perceived norms also show (a) students perceive an overestimation of alcohol use by members of the Greek system (Baer & Carney, 1993; Baer et al., 1991), (b) typical students are more comfortable with alcohol use than personal attitudes (Perkins & Berkowitz 1986; Prentice & Miller, 1993), and, (c) subjects reported perceiving close friends approval of excessive drinking as more than the subjects themselves (Alva, 1998; Baer, 1994; Prentice & Miller, 1993). In sum, many elevated descriptive and injunctive norms make excessive alcohol use seem common and acceptable, which in turn, will likely influence behavior. Perkins (1997) summarized the influence of norms on alcohol behavior by pointing out that the students who are socializing with peers who are perceived to both participate in and approve of excessive drinking may be at risk for increased levels of personal use. This does not mean to imply that all students exposed to such norms will experience excessive drinking behaviors or alcohol dependency. Instead there are many other psychological (e.g., religiosity) and

social (e.g., social support) moderators that play a role in influencing peer norms on alcohol use.

Prevention Strategies and Future Directions

Many alcohol programs and prevention strategies have been implemented over the past decade in colleges and universities in the United States. Based on data collected during this past decade, heavy episodic drinking has continued to increase implying that the prevention efforts have not been effective in regards to frequent binge drinkers (Keeling, 2002). These prevention efforts may have helped in increasing college students' prevalence rates of abstinence but the problem of excessive drinking (which leads to the harmful effects) has not been solved and has not shown a decline (Wechsler et al., 2000). There has been a lot of effort on the part of administrators, community leaders, and even students to change the patterns of dangerous drinking. These efforts have included: peer educators, social marketing campaigns, "social norming" campaigns, educational materials and classes, student assistant programs and not without the multitude of grants, campus-community coalitions, and concerned leaders.

The "hot" intervention program that almost half (48%) of all colleges and universities have or are currently conducting is a social norms campaign (Wechsler, 2003). Social norms campaigns were developed and heavily marketed in the 1990's. This approach emphasizes that students over-estimate the number of peers who are drinking and drinking heavily. The premise of this campaign is that if these misperceptions are corrected and students are educated that there is a much smaller percentage of actual alcohol use and abuse, the actual drinking percentages would

decline. In other words, the higher the perceived level of drinking, the more students will engage in drinking alcohol. There have been equivocal findings in the research conducted on "social norming". While evidence exists that social norm interventions reduce alcohol consumption among college students (Barnett, Far & Mauss, 1996; Gilder, Midyett, Mils-Novoa, Johannessen & Collins, 2001; Haines & Spear, 1996; Johannessen, Collins, Mils-Novoa & Gilder, 2000; Peeler, Far & Miller, 2000), there are others who have not found it to have any significant change in students' drinking patterns (Clapp, Russell, & DeJong, 2001; Granfield, 2002; Werch, Pappas, Carlson, Diclemente, Chally, & Sinder, 2000; Wechsler et al., 1997).

Evaluations of social norms marketing campaigns have been conducted on single college campuses and have not used equal comparison groups. As well, design flaws such as lack of random sampling limit any kind of conclusions about the programs' effectiveness. Scientific studies should be employed with acceptable and valid research methods to determine the true effectiveness of social norms campaigns (Wechsler, 2003). Using data from all four of the data sets from the CAS research studies and addressing the flaws of the previous research, Wechsler (2003) found almost all of the institutions used in the studies employed social norms programming and showed no decreases in any kind of alcohol drinking patterns.

So what will have a positive effect in helping to reduce dangerous drinking patterns? Wechsler et al., (2002) argues for tougher penalties for alcohol-associated violations of standards of conduct, limiting students' access to alcohol, and controlling marketing practices of the alcohol industry. Such control measures have much greater empirical support (Holder et al., 2000; Shults et al., 2001; Substance Abuse and Mental

Health Services Administration, 2001; Toomey & Wagenaar, 2002). Using data sets from the CORE and the 1994 Fund for the Improvement of Post-Secondary Education (FIPSE), Ziemelis, Bucknam, and Elfessi (2002) sponsored drug-prevention programs that criticized Wechsler's et al.'s (2000) findings that educational approaches had not helped decrease binge drinking rates. Ziemelis et al. problem with the CAS data set is that accurate assessment of the effectiveness of prevention programs can not be measured because the CAS could not detect whether or not schools had existing prevention programs in place before the surveys were administered. However, the CORE data and the FIPSE data do account for programs already in place. Ziemelis et al. (2002) found that significant changes occurred in their sample of 94 institutions regarding alcohol use from institution to institution. Their recommendations for alcohol programs included a three-construct model consisting of student participation and involvement, educational and informational processes, and campus regulatory and physical change efforts in addition to alternative activities, curriculum infusion, social norms, and alcohol restrictions/banning.

Keeling (2002) argues that the college environment needs to be changed along with involving students in the environmental program model. He also points out that there is room for combining the social-environmental approach that Ziemelis et al. (2002) are advocating as well as the regulation approach that has been identified by Wechsler et al. (1997). Keeling (2002) encourages environmental strategies such as alternative late night events and activities lasting well into the early morning hours, keg restriction, legislation to eliminate drink specials, control over liquor licenses, restrictions on alcohol advertising, and student leadership development programs.

Finally, the NIAAA Task Force on College Drinking (2002) has identified a 3-in-1 framework for a comprehensive program based on the research. Their recommendations include implementing programs at three different levels: (a) the individuals, including frequent, episodic drinkers, (b) the student population as a whole, and (c) the institution and the community. The individual level should consist of strategies to assist individuals who have been identified as a problem, at-risk or alcohol-dependent drinker. These would include alcohol screenings and intervention services. Strategies that address the second level, the student body as a whole, would include hindering the availability of alcohol, preventing the widespread social and commercial promotion of alcohol, filling large amounts of student free time with desirable activities that students would be attracted to, enforcement of campus policies and laws, and social norm campaigns. Lastly, the college and community must reinforce interventions together allowing for alliances among student affairs offices, residence life directors, local police, and retail alcohol establishments to work cooperatively in resolving student alcohol issues (Hingson & Howland, 2002; Perry & Kelder, 1992).

Alcohol and Athletics

Patterns of Alcohol Use

The NCAA has taken the lead in examining the use of drugs and alcohol among collegiate athletes with funding national studies published in 1984 (Anderson & McKeag, 1985), 1989 (Anderson, Albrecht, & McKeag, 1991), and 1993 (Anderson et al., 1993), and 1997 (Green et al., 2001). These studies involved thousands of athletes from many sports and from institutions from all throughout the United States. These studies provide

important data in documenting trends in the alcohol and drug use habits of college athletes. Other major data sources that have examined college athletes include Wechsler and his colleagues (CAS) and Presley and his colleagues (CORE). Results from these nationally represented studies are examined throughout the literature review.

Though research has explored the relationship between sport participation and alcohol use there is still much to be learned. In one of the only studies done before the 1980s, Straus and Bacon (1953) theorized that athletes would be less likely to drink alcohol than their non-athlete peers to maintain top physical fitness and because they would have less time to devote to social activities. Using 15,747 students from 27 colleges, the researchers found that athletes reported drinking more than their non-athletic peers. Results showed 87% of male athletes compared to 77% of male non-athletes consumed alcohol. More female athletes (60%) drank than female non-athletes (52%).

Research in the 1980s and early 1990s concluded overall that athletes' alcohol patterns were similar to those of their non-athlete peers as well as the numbers that have been found for society at large (Anderson & Snellman, 1986; Duda, 1984; Gay et al., 1990; Toohey, 1978; Toohey & Corder, 1981). In one of the first published studies of college athlete drug use, Toohey and Corder (1981) reported the nonmedical use of drugs of 50 female and 17 male swimmers at six American universities and compared their use rates with 678 non-athletes. Ninety-two percent of the athletes reported they used alcohol. The researchers found that the use of alcohol and drugs by athletes was similar to use of their non-athlete peers. Other studies of athlete and non-athlete alcohol consumption among college students lend support to the idea that alcohol use by athletes and non-athletes is similar. Anderson and McKeag (1989) found 88% of the athletes

reporting alcohol use in the preceding 12 months. These findings were somewhat lower but still comparable to alcohol use reported by college students in a national survey conducted by Johnston et al., (1994). Overman and Terry (1991) found no significant differences in alcohol use between athletes and non-athletes in a study of students from two state universities and two private colleges. However, they found evidence indicating that drinking patterns may vary between athletes and non-athletes. They concluded that male non-athletes drink significantly more during the week than male athletes, who tended to drink more on weekends or special occasions. Also, athletes reported drinking more beer than non-athletes; perhaps this reflects the influences of marketing strategy of beer distributors associated with participation in sport.

Furthermore, Anderson et al. (1991), in a survey of 2,282 varsity athletes, contracted by the NCAA, found that the annual rate of athletes' alcohol use was 90% while the college population was 92%. Very few studies found athletes less likely to drink alcohol (Kokotailo et al, 1996; Koss & Gaines, 1993). Most recently, however, Green et al. (2001) conducted an expansion of the NCAA surveys and found annual alcohol use among athletes to have dropped to 81%. Still other studies found results supporting the research that athletes consume more alcohol than the general student population (Leichliter et al., 1998; Selby, Weinstien, & Bird, 1990; Toohey, 1978).

However, the trends in alcohol drinking patterns among college athletes have shifted since the mid to late 1990's. These trends include more athletes choosing to abstain from alcohol while the smaller percentage of athletes that are using have shown an increase in the frequency and amount of alcohol being consumed (Green et al., 2001; Leichliter et al., 1998; Nelson & Wechsler, 2001).

Interestingly, there has been little research that addressed athletes' alcohol use at different times of the year. O'Brien (1993) found that despite a high reported use of alcohol among athletes, the actual amount of alcohol consumed by athletes in training is low. In another study, using 247 athletes from a major private university, 60% of male athletes used alcohol at least once a week during their off season but decreased to 42% during the competitive season. Results for women were similar, 41% drank during the off-season and 26% drank during the competitive season (Selby et al., 1990). Finally, Thombs (2000), using 297 athletes, representing 18 teams at a public university in the Midwest, found 37% of the athletes abstaining during the season of competition.

The definition of binge drinking is heavy, episodic alcohol consumption usually consuming five or more drinks in any one sitting for men and four drinks for women (Wechsler et al., 1994). Although the annual prevalence rate of drinking from 1985 to 1989 decreased among athletes, the rate of binge drinking rose (Anderson et al., 1991). Drinking three or more times a week was reported by 29% of the athletes in 1985 while that percentage dropped to 20% in 1989. On the other hand, the quantity of alcohol consumed at each sitting increased during the four year span: 36% drinking an average of six or more drinks in 1985, compared with 43% in 1989. Wechsler et al., (1997), using the CAS data set, surveyed 17,251 college students from 140 American colleges, examined binge drinking and different levels of involvement in athletics. The researchers found 61% of the men involved in athletics (those who spent at least 1 hour per day involved in intercollegiate athletics and thought intercollegiate sports were important) engaged in binge drinking while 55% of men partly involved in athletics (those who spent 1 hour per day involved in intercollegiate athletics or thought intercollegiate sports

were important) were binge drinkers. Among the men not involved in athletics, only 43% were binge drinkers. Women's results were similar. In addition, 29% of male athletes and 24% of female athletes engaged in binge drinking three or more times within the past 2 weeks compared to 18% of male non-athletes and 15% of female non-athletes. The authors found the more involved one was in athletics the higher the binge drinking.

Similarly, Leichliter et al. (1998) used data from 51,483 students at 125 institutions and found binge drinking rose for men and women as the degree of athletic involvement increased. For males, 45% of the non-participants reported binging, 61% of athletic team members binged and 64% of athletic team leaders binged. For female non-participants, the binge rate was 31%, for athletic team members it was 47%, and for athletic team leaders it was 49%.

Additionally, Nelson and Wechsler (2001), using another CAS data set, analyzed responses from 12,770 college students from 130 colleges and universities and reported that athletes binged at higher rates than non-athlete students. Among the male students, 57% of athletes reported binge drinking at least once during the previous 2 weeks compared to 49% of the male non-athletes. Among the females, 48% of athletes reported binge drinking, while 40% of non-athletes did so. They concluded that athletes are more likely than non-athletes to be surrounded by the type of social environment that is associated with binge drinking. These include having five or more close friends, considering parties as important to them, spending an average of 2 or more hours per day socializing, and having more friends that are binge drinkers.

Gender Differences in Athlete Alcohol Use

Overall, research shows that male athletes tend to drink more often and binge drink more than female athletes. Wechsler et al. (1997) found 61% of the men involved in athletics engaged in binge drinking compared to 50% of women athletes. In addition, 21% of the male athletes drank to get drunk compared to 12% of women athletes. Nelson and Wechsler (2001) found similar results. Using 12,770 college athletes from 130 different institutions, 57% of male athletes reported binge drinking during the past 2 weeks compared to 48% of female athletes. Selby et al. (1990), using 247 varsity athletes at a major private university from 27 varsity athletic teams, found there were significant sex differences in alcohol use during the off season. Sixty percent of male athletes and 41% of female athletes used alcohol at least once a week during their off season. During the competitive season, alcohol use decreased to 42% for the men and 26% for the women.

In a study using 271 athletes at two Midwestern universities, gender differences showed the male athletes had a higher prevalence of risk behaviors (swimming under the influence of alcohol, driving under the influence of alcohol, riding in a car with a driver who was under the influence of alcohol) than their male non-athlete counterparts, while female athletes had fewer risk behaviors than their female non-athlete counterparts (Kokotailo et al., 1996). Overman and Terry (1991) found no differences between male and female athletes in frequency or in amounts of alcohol consumed.

Alcohol Consumption Across Different Sports

There has been little research conducted examining differences in alcohol consumption across different sports. Future research needs to focus on the differences between sports specifically to determine if any patterns emerge among certain types of sports (individual sports vs. team sports, contact sports vs. noncontact sports, aerobic sports vs. anaerobic sports, media driven sports vs. nonmedia driven sports, and sports with a long length of season vs. sports that have a short length of season). Of the few studies that have aimed to separate the sports, they have found that different sports tend to have different drinking patterns. Lyons (1998), in a study in Great Britain, found traditional field sports such as rugby, cricket, hurling, soccer, and Gaelic football had athletes who consumed the most alcohol compared to other sports like cycling, horse racing, and tennis.

In a replicated NCAA study of 2,282 athletes from colleges across the country, Anderson et al. (1991), found that the highest rates of alcohol use were from male tennis players (96%) and the lowest were from female tennis players (83%). Other sports to note included a low rate of alcohol use in men's basketball (78%) and a high rate of use in men's football (90%) and women's swimming (93%). Explanations for these sport-specific patterns were not investigated.

University/College Divisions in Alcohol and Drug Use

Green et al. (2001), using data from the NCAA Study in 1997, found the likelihood of athletes using alcohol, amphetamines, marijuana and psychedelics was highest among Division III schools (82.6%) compared to Division II (79.7%) and

Division I (79.2%). The NCAA (2001) found mostly the same result in their 2001 data. These alcohol percentages are based on alcohol use within the previous year not binge drinking. Clearly, there are different variables involved in drug and alcohol use when comparing different sizes of schools. Schools that are smaller have also been reported to have higher drinking patterns than schools that are larger (NIAAA, 2002). It could be speculated that Division III athletes have more time to socialize because they spend less amount of time in their sport since they are attending a college that promotes being a student first. Not being paid to play (being on scholarship) might also contribute to some athletes feeling that they do not feel as much responsibility to their sport or do not take it as seriously as others who would be on scholarship. There is a growing number of schools that are becoming members of Division III. There is a plethora of applications from NAIA schools that are seeking to become a part of Division III in NCAA because they are not satisfied with the operations of NAIA. In fact, Division III membership in NCAA has arisen to 435 member schools with projections by the year 2010 to be around 450 member schools (NCAA Report, 2003). Because of this continual growth, the variables that cause Division III athletes to drink more alcohol need to be identified and examined with future research.

Athletes and High-Risk Behaviors

Research has examined whether athletes, in addition to college students, may also be at an increased risk for other unhealthy lifestyle behaviors. Anderson et al. (1993) compared the results from their previous two studies in 1985 and 1989 on substance use

and abuse habits of college student-athletes. In this study, 2,505 varsity athletes from 11 NCAA institutions were surveyed. The authors found the following trends:

1) While the number of occasions that athletes reported drinking was fewer, the amount of alcohol consumed on each occasion increased.

2) Use of anabolic steroids had increased in Division II and Division III colleges.

3) Smokeless tobacco use dropped slightly among baseball, football, and softball athletes but increased among basketball, tennis, track and swimmers.

4) Over 26% of male athletes and nearly 6% of female athletes reported having at least four different sexual partners in the preceding 12 months. Of the sexually active student-athletes, approximately 22% reported they "rarely or never" used a condom when they had sexual intercourse.

5) Approximately 10-12% of the student-athletes reported a history of at least one sexually transmitted disease.

Nattiv and Puffer (1997) using a total of 2,298 athletes from around the country and 683 randomized non-athlete controls, found male athletes had more risk-taking behaviors than female athletes. Also, athletes involved in contact sports demonstrated more risk-taking behaviors than did athletes in noncontact sports. Overall, athletes demonstrated significantly higher risk taking behaviors than non-athletes in the following ways: less likely to always to use seatbelts; less likely always to use helmets with

motorcycles, moped, and bicycles; more often drive as a passenger with a driver under the influence of alcohol or drugs; greater quantity and frequency of alcoholic beverages; greater frequency of smokeless tobacco and anabolic steroid use; less-safe sex; greater number of sexual partners; less contraceptive use; and more involvement in physical fights.

In a study of 271 athletes and 775 non-athlete peers from two large Midwestern universities, Kokatailo et al. (1996), found risk-taking behaviors varied by gender. Male athletes reported higher risk behaviors than their male non-athlete peers while female athletes were found to have fewer risk behaviors than their female, non-athletic peers.

Bakker (1996) using 1,539 athletes in fall sports seasons from Division III schools in the Midwest similarly found the differences in high-risk behavior scores were significantly higher for males than for females. Also, high-risk behavior scores were higher for athletes than non-athletes. Nattiv and Puffer (1991) examined the health risk behaviors of athletes and non-athletes at UCLA. In the area of alcohol, athletes consumed greater quantities of alcohol per sitting, drove more frequently while intoxicated, and rode with a driver who was intoxicated more frequently. One limitation to the study was that it was conducted at only one university. Another weakness to this study was that the control group of non-athletes consisted of students in an Introduction to Psychology course. Thirty percent of the population from the control group was of Asian ethnicity while only 4% of the athlete's population was Asian. In addition, the non-athlete group consisted of mostly freshmen while the athlete group was composed of mostly upperclassmen (Nattiv & Puffer, 1991).

The research shows that athletes, in general, demonstrate higher risk behaviors than the general college population. However, this research is only descriptive in nature. It does not provide the reasons behind the behaviors. For prevention strategies to be successful, researchers must examine the underlying reasons for risk-taking behaviors

Some athletes turn to drugs to improve their level of performance (Wadler & Hainline, 1989). This is one area for reasons why athletes are at a greater risk. However, this paper will not address the issue of performance enhancing drugs but instead focus on recreational or social drug use—specifically alcohol. One theory that has been researched as to why athletes demonstrate greater risk behaviors is the notion that they are under more pressure or stress than non-athletes. These would include pressures to perform, missed class, academics, time commitments, stress, and dealing with pain (Chappel, 1987; Clement, 1983; Ogilvie, 1981). Athletes are expected to maintain high levels of performance, often in the face of tremendous stressors. They are under constant scrutiny by the public, friends, family, and the media.

Tricker, Cook, and McGuire (1989) discussed a number of hypotheses regarding how the sports experience may place college athletes at a higher risk for alcohol and drug abuse. Athletes experience many risks directly related to the rewards and frustrations of athletic competition. Additionally, athletes' lifestyles often involve excessive travel and exposure to social settings to represent the school that frequently include the use of alcohol.

Social settings provide athletes with increased opportunities for using alcohol as well as other drugs. Because a natural part of sports includes risk-taking, some athletes may regard the risks of drug abuse inconsequential (Thibault, Lambert, Rivard, Brodeur,

& St. Jacques, 1984). As risk-takers, some athletes may feel invulnerable, believing that no harm will come to them (Tricker et al., 1989).). Leichliter et al., (1998) speculated that athletes may experience a "work hard, play hard" ethic to a greater extent than non-athletes.

Consequences Specific to Athletes

Not only have college athletes been found to have higher prevalence rates of alcohol consumption and drink significantly more per occasion than non-athletes, they also have been found to experience more drinking-related consequences including engaging in more sexual violence than their non-athletic peers (Frintner & Rubinson, 1993; Nattiv & Puffer, 1991). Nattiv and Puffer (1991) surveyed athletes and non-athletes from a major collegiate institution and found significantly more athletes (49%) engaged in driving under the influence of alcohol and riding with intoxicated drivers than non-athletes (12%). The athletes also reported having more sexual partners (athletes, 28%; non-athletes, 12.7%) as well as contracting sexually transmitted infections (STI) than non-athletes (athletes, 11.6%; non-athletes, 2.8%), and less frequent seatbelt use (athletes, 47%; non-athletes, 26%). Frintner and Rubinson (1993) found that although male athletes made up less than 2% of the male campus population at a large Midwestern university, they were involved in 20% of the reported attempted sexual assault cases and sexual assault cases, 14% of the cases on campus sexual abuse, and 11% of the battery cases.

Leichliter et al. (1998), using 58,453 students from the CORE data set from between 1994-1996, found that athletes experienced 18 of 19 consequences significantly

more than non-athletes. These included hangover, impaired academic work, trouble with police, vandalism, arguments or fights, nauseated or vomited, driving under the influence, missed class, memory loss, regretting actions, arrested for DUI, been taken advantage of sexually, taken advantage of someone sexually, and been hurt or injured. The only consequence that was not found to have a significant difference was feelings and attempts of suicide. Interestingly, male athletes who were in formal leadership positions (captains) were found to have experienced more consequences than the member male athletes and the non-athletes. For the females, there were 14 significant differences between athletes and non-athletes but few differences between female athletes in formal leadership positions and member female athletes.

A particular consequence of alcohol use for athletes is its effect on physical performance. The American College of Sports Medicine (1982) conducted a comprehensive analysis on the effects of alcohol on physical performance. Findings showed that acute ingestion of alcohol has a deleterious effect on many psychomotor skills. Researchers concluded that in sports involving rapid reactions to changing stimuli, small to moderate amounts of alcohol will impair reaction time, hand-eye coordination, accuracy, balance, and complex coordination of gross motor skills. According to the American College of Sports Medicine (1982), alcohol appears to have little or no beneficial effect on the metabolic and physiological responses to exercise. In the studies reporting significant effects, the change appears to be detrimental to performance. Alcohol consumption does not substantially influence physiological function crucial to physical performance (maximal oxygen uptake, respiratory dynamics, and cardiac function). Alcohol ingestion will not improve muscular work capacity and may decrease

performance levels. O'Brien (1991) found that the consumption of alcohol in the 24 hours prior to athletic activity significantly hindered aerobic performance by 11.4%. Finally, results showed that alcohol may impair temperature regulation during prolonged exercise in a cold environment. Other research suggests that the acute ingestion of alcohol also decreases performance levels. Bond, Franks, and Howlett (1983) found that total cycling time to exhaustion was always shorter after alcohol use compared to the subjects in the placebo group. Another study found serum alcohol concentrations over 100mg/dl weakened the pumping force of the heart (Lang, Borow, & Neumann, 1985). Houmard, Langenfeld, and Wiley (1987) examined 18 male runners who underwent a 5 mile treadmill run and found the average running time was 28 seconds longer after alcohol consumption.

Acute ingestion of alcohol should be discouraged to avoid the negative effects on athletic performance. The acute ingestion of alcohol before exercise or competition should be discouraged, as it adversely affects sports performance. These practices are probably most prevalent in recreational athletes in traditional sports such as slow-pitch softball, rugby, and football (Fox, 1984; O'Brien & Lyons, 2000). When interpreting the results of these studies it is important to keep in mind several precautions. First, there are varying reactions of alcohol consumption, not only among individuals, but also within an individual depending on the circumstances. Second, it is almost impossible to do double-blind placebo research with alcohol because subjects can usually tell when alcohol has been consumed and when they were given the placebo.

A reason for concern of acute alcohol consumption before activity is that it can be a prelude for many medical problems as well as resulting in possible death. The use of

alcohol before any aquatic sport should be outlawed; as there is always the potential for a catastrophic outcome to an accident or emergency in the water. Branche, Sniezek, and Sattin (1991) found that alcohol was reported to be a significant factor in spinal injuries. The people involved in spinal cord injuries while doing recreational water sports were shown to have consumed alcohol significantly more than a control group. Michalodimitrakis and Patsalis (1987) found that when using alcohol, scuba divers experienced the potentially fatal 'nitrogen narcoses at shallower depths than did scuba divers who abstained from alcohol. In a study of 753 drowning victims, 53% tested positive for alcohol and 38% had blood alcohol concentrations of 100mg/100ml of blood or greater (Patetta & Biddinger, 1988). Other acute effects of alcohol include vestibular system dysfunction which affects activities that require excellent balance (O'Brien & Lyons, 2000), weakening of the left ventricle contraction (Strauss, 1991), and exercise induced asthma (Nichols, 1992). Also, Heath, Ford, and Craven (1991) found that male runners who consumed alcohol reported greater incidence of upper respiratory tract infections than those runners who did not consume alcohol.

The pattern of a long-term chronic abuse of alcohol may have its beginning in the post-match social sports setting (O'Brien, 1993). This trend could continue after the athletes' years in competition end and continue with social events surrounding sporting events but from a spectator's perspective. Athletes are not immune to long-term effects of alcohol later in life. These chronic conditions include liver toxicity, endocrine dysfunction, decreased serum testosterone, seizures, and altered lipid metabolism (O'Brien & Lyons, 2000). Furthermore, when alcohol use turns to abuse and possibly dependence, there is serious risk of mortality.

Alcohol and injury have also been examined. O'Brien and Lyons (2000) reported that there is a significant difference in injury rates between athletes who consumed alcohol and those who did not. Athletes who drank alcohol at least once per week had a much higher injury rate (54.8%), more than double that of athletes who were nondrinkers (23.5%). These findings included every sport. The study which included 423 athletes, showed that 58% of the elite athletes surveyed consumed an alcoholic beverage before competition or scheduled training (Lyons, 1998; O'Brien, 1993). Caution needs to be taken in making conclusions, for it is important to consider which variable could be the cause and effect. Does regular alcohol use increase chance of injury or could athletes who become injured consume more alcohol on a regular basis than their non-injured teammates? Could athletes who drink alcohol be more prone to injury because they are prone to have more risk-taking tendencies compared to athletes who do not drink alcohol? There is much more research that needs to be conducted in this area. If it were indeed concluded that light or moderate alcohol use during the competitive season or during training causes an increase in injury or hurts performance, this could be a major incentive for athletes to abstain from drinking alcohol. Wechsler et al. (1999) found the number one reason for athletes not drinking alcohol was because of effect on performance.

In a study of post-alcohol fitness assessments (O'Brien, 1993), rugby players were asked to consume their normal Friday night quantity of alcohol. No particular quantity of alcohol was specified. All volunteers had a similar night's sleep, and all had a similar food intake for breakfast. They were asked to return to training 16 hours later, and post-alcohol (hangover) fitness assessments were then performed. The amount of

alcohol consumed was calculated in standard units of alcohol. The results of the experiment showed that alcohol hangover had a significantly negative effect on aerobic performance. On average, the athletes performed 11% worse in the hangover phase. Any quantity of alcohol produced a negative effect on aerobic performance. Anaerobic performance was unaltered by the consumption of alcohol. O'Brien concluded that the hangover effect of alcohol produced a significant decrease in aerobic performance after varying amounts had been consumed. O'Brien postulated that the decrease in aerobic performance observed can be explained by the metabolic effects of alcohol which include: (a) the effect on the citric acid cycle which slows aerobic metabolism, (b) the effect on the lactate and pyruvate ratio which is a factor in poor aerobic performance, (c) the dehydrating effect which is associated with reduction in aerobic performance, (d) the effect on available carbohydrates for fuel needed for energy production, and (e) the psychological effect of not feeling like they can compete to their potential. Similar findings of the hangover effect were found in a group of pilots who were tested for visual-motor co-ordination assessment before and a day after a small amount of alcohol had been consumed (Yesavage & Leirer, 1986).

Limitations to the Research

There are some limitations to the studies reviewed. Many of the studies on college athletes have been conducted on a single college campus or a few college campuses in close proximity to each other and thus may not be generalized to the whole population of intercollegiate athletes. This could account for the variation in findings. The reported findings from the few existing multicollege studies may also not be

generalized because random sampling was not used. Other studies sampled athletes from only one sport or used data from colleges in one state only.

Another limitation to the research is the different definitions of alcohol use when reporting percentages of alcohol use by athletes and non-athletes. Some studies have reported alcohol use as consuming any amount of alcohol within the last year. Another study (O'Hare, 1990) used the definition of alcohol user if subjects drank 2 times within the last year. While yet others used the scale of drinking within the last month or 2 weeks. When interpreting the data, it is important to find out what criteria were used to determine the subject's rating as being a drinker or nondrinker. It is crucial that the percentages of these studies using different criteria should not be compared in the same way. Furthermore, most of the studies conducted did not take into consideration the time of the year for the athletes. O'Brien (1993) and Selby et al. (1990) found that athletes consumed significantly less alcohol during their competitive season. If these findings are true for the entire athletic population, then the time of the study as well as what athletes from what sports athletes are being surveyed could end up with drastically different results. Other limitations of most of the research studies included self-reported surveys in which subjects could have misinterpreted questions. Also, the subjects were asked to provide sensitive and personal information, which could cause underreporting or over-reporting.

Although many of these studies were important initial efforts, it remains difficult to draw valid conclusions about the current alcohol and drug habits of all college athletes. Comparisons among the studies are difficult because many of them were conducted 5 to 15 years ago when alcohol and drug use were defined differently, surveyed different

types of drugs, used different surveying instruments and procedures, and because as social disapproval/acceptance of drug use changes so will the trends of use change. In addition, as mentioned previously, most of the research on alcohol use patterns in college student populations and college athletes is only descriptive. The research does not examine the reasons behind the differences in alcohol use patterns, which is necessary to developing successful prevention programs.

Future Directions and Considerations

The research findings up to the present time indicate that college healthcare providers and educators need to pay more attention to the alcohol use habits of student-athletes. Although coaches and team regulations almost always prohibit alcohol use during the playing season or before competition, the research shows that, as a group, athletes drink more, binge drink more, and drink more often than do non-athletes. The majority of research in the area of alcohol and athletics has compared athletes' alcohol consumption rates to those of the student population. The results have varied with some studies finding the percent of athletes' use slightly above the percent of the student population and some have found the percent to be the same or slightly lower than that of the student population. It cannot be disputed that regardless of the findings, athletes are consuming alcohol at a high percent, and there are many questions yet to be answered in regard to this topic. There has only been one study to examine alcohol use in athletes at different divisions in colleges/universities (Green et al., 2001). There has also been only one study conducted to look at leaders/captains alcohol use compared to team members' use (Leichliter et al., 1998). Furthermore, it would be important to examine the

relationship between leaders' alcohol use and its relationship to their specific team members' alcohol use. There has not been any research conducted in this area. To go a little further, how would the leaders' alcohol use affect new members of the team's alcohol use? Are the new members' decisions to use alcohol influenced by the leaders of the team?

Few studies have been conducted examining alcohol use in specific sports and why the differences between sports. An investigation of students' substance use and related consequences, according to not only the specific sports but also the type of sport (team vs. individual, contact vs. non-contact) could possibly prove to be of considerable interest. As indicated, the research has only begun to tap into the complicated puzzle of athlete alcohol use and abuse. There also needs to be more research on the specific genders with alcohol use and what is unique about each gender that might influence alcohol use or help inhibit the abuse of alcohol. Finally, now that researchers have a good outlook on the patterns of alcohol use within certain subgroups, it is time to examine and identify different variables within these subgroups that promote positive decisions regarding drinking. The success of existing and future programs of alcohol use prevention and intervention will rely particularly upon the cooperative and collective efforts of athletes, captains, coaches, trainers, athletic administrators, health educators, and sport psychologists. Future research could also include alcohol information with intramural athletes.

Conclusion

The major focus of prevention techniques for any college population must provide more than just information about risk factors. Education must also include information on dealing with motivations, non-chemical alternatives, the decision-making process, and the effects on human performance (Gay et al., 1990). College athletes have been targeted for education programs that address alcohol use. The NCAA has developed and sponsored drug and alcohol education programs and a speakers' program targeted specifically for athletes in their member schools. The NCAA also runs a program called the Professional in Residence program at the Betty Ford Center. This program educates university officials and coaches on alcoholism and drug addiction which gives athletic administrators and coaches, first hand, an understanding of the warning signs of an alcohol abuser as well as education on what athletes and students need to do to get help if they have a dependency on alcohol and/or other drugs. Another program the NCAA has established to help athletic programs with alcohol, tobacco, and other drugs is the Athletic Prevention, Programming and Leadership Education (APPLE) model. This prevention program is tailored specifically for college athletic departments to help develop a comprehensive, site-and-team-specific program to educate athletes on substance abuse and to encourage responsible decision-making (Grossman & Smiley, 1999).

However, education alone has not sufficiently impacted the problem. The findings in the last few years indicate that the percentage of athletes using alcohol is decreasing slightly but the rate of binge drinking among athletes is increasing. Binge drinking by athletes is becoming a growing concern. Nelson and Wechsler (2001) found

that athletes who received education on both the acute and chronic risks of alcohol were not less likely to binge drink than those who did not receive education. In addition to education, future prevention efforts targeted for athletes should address the unique social and environmental influences on athletes. Programs need to take advantage of motives of athletes for self-limiting alcohol intake. One topic that needs to get more attention is the relationship between alcohol use and injury.

Prevention efforts need to also address the colleges' policy making decisions regarding alcohol use and abuse. Stricter reinforcement of alcohol policies, helping lessen the availability of alcohol around campuses, and restricting the alcohol industry to promote alcohol on campus and around athletic events are just a few of the things that would help to change the culture involving alcohol among the college population.

Alcohol and drug abuse in sport must be considered within the context of the drugs in society at large. Alcohol continues to be the most commonly used drug in the athletic community. It is a depressant drug that, with inappropriate use, is associated with both short term and long term morbidity and possible mortality. Education of young athletes and coaches, along with addressing the unique social and environmental variables of college athletics, could be a cornerstone in dealing with this epidemic of alcohol abuse on college campuses.

Chapter 3

METHOD

Participants

The study included athletes from 42 Division III 4-year colleges throughout the Midwest. The athletes used for the study were members of women's softball teams. Each team consisted of 16-22 softball players and their head coach. Athletes ranged in age from 18-23 (M = 19.83) years. The athletes consisted of 36.6% freshmen, 28% sophomores, 21.8% juniors and 13.3% seniors. These athletes competed at the national level against other players from Division III teams. Ethnic origin was primarily white Caucasian (94%). Almost 70% of respondents lived on campus and all were full-time students except for one. It should be noted that since the subjects were all from Division III they were not given scholarships to play softball.

Measures

All participants completed the short form of the Core Alcohol and Drug Survey (Presley et al., 1998), which is designed to assess various factors related to students' drug and alcohol use on college campuses (See Appendix E). The surveys were given to the participants near the end of their softball season. The short form questionnaire consists of 23 items and covers a variety of substantive areas, including demographics, extracurricular activities, alcohol and drug use, perceptions of the campus environment, campus climate, campus violence, and negative consequences that result from use of alcohol or drugs. The questions involve various ordinal scales, with the exception of a few of the demographic questions which are yes/no questions.

There were an additional five questions that pertained to the athletes' perception of their coach's emphasis of obeying an alcohol or drug policy, perception of their coach's enforcing an alcohol or drug policy, if their team had additional restrictions to any school alcohol or drug policy, consuming alcohol out-of-season, and if they were a team captain. The questions pertaining to being a captain, and having additional restrictions to any school alcohol or drug policy were answered on a yes/no scale. The question asking how much emphasis the coach has placed on obeying an alcohol or drug policy was on an ordinal scale of no emphasis, has emphasized on one occasion, has emphasized on 2-3 occasions or has emphasized on 4 or more occasions. The question asking the players to predict their coach's enforcement of an alcohol and drug policy included responses that the coach would look the other way, would confront and turn in the player(s), or that they did not know. The surveys were anonymous -- no name or identification number was put on any forms. The survey is included in Appendix E.

Procedures

Following approval from the Institutional Review Board, 63 head coaches of women's collegiate Division III softball teams were contacted to explain the purpose of the research and to seek permission allowing their athletes to participate. Coaches were informed that the one-time survey would take 10-15 min. to complete and the questionnaire should be administered by a team manager or athletic trainer near the completion of their season. Once coaches had given their approval, the investigator asked coaches for the contact person's name and address so the questionnaires could be sent out via mail. Also, coaches were asked a few questions which included:

1. How many members are on your softball team? This question was asked to be able to determine response rate and to know how many questionnaires needed to be sent.
2. How many team captains are on your team? This question was asked to find out if a team did indeed have captains and to determine response rates of captains.
3. How were your captains chosen- were they elected by their teammates, were they appointed by the coach or were they chosen by a combinations of elected and appointed? This question was asked to be able to further understand the nature of the captains on each team in relationship with their teammates.

Questionnaire packets were mailed to the contact person, who then distributed the questionnaires to the athletes. The contact person had the athletes complete the survey in a classroom, monitoring that there was no talking while the survey was being completed, and that the athletes were isolated enough to assure privacy. After the athletes completed the consent form, they were given the questionnaire and an envelope. When the survey was completed, athletes were asked to place the completed questionnaire in their personal envelope and seal it and then put the envelope in a self-addressed, prepaid larger envelope held by the administrator. When the last survey was completed, the onsite administrator sealed the envelope and personally put it in the mail.

Coaches were contacted in Mid-March of 2004. Sixty three coaches were personally contacted via telephone; 60 agreed to have their team be a part of the study.

Sixty were chosen so that the response rate would be a minimum of 40 teams to ensure that the sample size was large enough for statistical power to analyze the data. Participating coaches were selected from a national softball directory as well as from coaches who were colleagues of the author. Participants were all from schools located in a six-state Midwest region including: Illinois, Iowa, Michigan, Minnesota, Ohio, and Wisconsin. Questionnaire packets were mailed between April 15 and May 15, 2004. Questionnaire packets that were sent back were received between April 30 and May 31, 2004. Of the 60 questionnaire packets sent to the teams, there was a 73% response rate. After taking a careful examination of the data, two teams were eliminated from the data set for not being able to identify all of the captains.

Once the questionnaires were all sent to the investigator, the packets were given a team and an individual number. They were then sent to the Core Institute at Southern Illinois University to be scanned for the data analysis. The scanned data were then returned to the investigator via floppy disk.

Treatment of the Data

Research Question 1. To answer Research Question 1: "Do team captains use less alcohol and binge drink less than non-captain athletes?" a comparison of means and percentages was conducted separately for determining binge drinking rates (Items 14) and average number of drinks per week (Item 15). In addition, a factor analysis using principal components with no rotation was conducted to create an index score for alcohol use. A one-factor score measure on alcohol was produced using four items from the survey including binge drinking (Item 14), average number of drinks consumed per week

(Item 15), annual rate of drinking (Item 17b), and number of times over the past 30 days they consumed alcohol (Item 18b). Inspection of the eigenvalues from the factor analysis suggested the presence of one large factor (3.06) which accounted for 76.5% of the variance. A principal component factor analysis of the factor showed high loadings which included: (a) past 30 day alcohol use (.92), (b) five or more drinks in the past 2 weeks (.88), (c) average number of drinks per week (.85), and (d) alcohol use in the last year (.85). Cronbach's Alpha was reported at .68. A series of chi-square analyses were conducted to examine negative consequences related to alcohol use (Item 21a-21s).

Research Questions 2-4. To examine Research Questions 2, 3, and 4, alcohol use data among the non-captains were aggregated to the team level for analysis using hierarchical linear modeling (HLM: Raudensbush & Bryk, 2002). HLM was used because it does not ignore the variability within teams that occurs when data are aggregated, and investigators can examine both within team and among team variances simultaneously. The team members' data will be referred to as the non-captains' data in the analyses and results to make it clear that captains' data are excluded in the team means.

The first step in the HLM process was to calculate the intraclass correlation coefficient (ICC) for non-captain use (the dependent variable of interest) to determine the proportion of variance that is due to between team differences. If the proportion of the variance in non-captain use is due to within team differences, this indicates that non-captain use is influenced by the team and HLM is warranted. The first model to be tested in HLM is the individual-level model or unconditional model from which the ICC is

calculated. For the unconditional model of alcohol use, the within group or individual level parameters (β coefficients) were allowed to randomly vary across groups, resulting in the following level model:

Level 1: Y_{ij} (non-captains' alcohol use) $= \beta_{0j} + r_{ij}$, where

. β_{0j} = the mean of non-captain use for team *j*,

r_{ij} = the unique effect of athlete *i* for team *j*,

Level 2: $\beta_{0j} = \gamma_{00} + u_{0j}$, where

. γ_{00} = the average team mean of non-captain use,

u_{0j} = the unique effect of team *j* on the average team non-captain use mean.

Of particular interest in this model was the variance of r_{ij} (the within team variance), and the variance of u_{0j} (the between team variance). These variances were used to estimate the ICC of non-captain use.

The second model to be tested was the conditional model where the individual level parameter (β_{0j}) became the dependent variable in the team-level model. Because Questions 2-4 posed three different predictors (captains' alcohol use, coach's emphasis, and team alcohol policy) on the same dependent variable (non-captains' alcohol use), only one simultaneous multiple regression analysis was used instead of conducting three separate regression analyses and increasing the possibility of making a Type I error. Therefore the following conditional model was tested:

Level 1 Y_{ij} (non-captains' alcohol use) $= \beta_{0j}$ (non-captain mean for team j) $+ r_{ij}$

Level 2 $\beta_{0j} = \gamma_{00} + \gamma_{01} + \gamma_{02} + \gamma_{03} + u_{0j}$, where

γ_{00} = the weighted mean for β_{0jS},

γ_{01} = captains' alcohol use,

γ_{02} = coaches' emphasis,

γ_{03} = teams' additional alcohol policy, and

u_{0j} = the random effect.

Captains' alcohol use was the predictor variable for Research Question 2 (Items 14, 15, 17b and 18b on the Core survey), coaches' emphasis was the predictor variable for Question 3 (Item 26 on the Core survey), and the teams' additional alcohol policy was the predictor variable for Question 4 (Item 25 on the Core survey).

A comparison of means and percentages was used to analyze binge drinking (Item 14), average number of drinks consumed per week (Item 15), annual rate of drinking (Item 17b), and number of times over the past 30 days they consumed alcohol (Item 18b) Analysis was conducted separately for items numbered 14 and 15. In addition, analysis was conducted using all four items to produce an index, using factor analyses, to produce a one-factor score on alcohol use.

Chapter 4

RESULTS

The results are organized around descriptive statistics and the four research questions. The first section describes some of the descriptive statistics stemming from the Core Survey. This is followed by sections that analyze the four questions. Within each question, descriptive statistics are presented first, followed by inferential statistics. All statistical analyses are reported at the .05 level of significance unless otherwise specified.

Descriptive Statistics

The first use of alcohol was determined from responses on a 9-point ordinal scale (See Item #16 in Appendix E). The average mean of the first use of alcohol by all players was between 15-16 years of age ($M = 5.39$, $SD = 1.94$). Captains' mean average age of first alcohol use ($M = 5.37$, $SD = 2.04$) was very similar to non-captains' age of first alcohol use ($M = 5.40$, $SD = 1.92$), $F(1,614) = .03$, $p = .87$. The highest percentage of both captains' and non-captains' age of first use of alcohol was between the ages of 18-20 (captains' = 36.5%, non-captains' = 31.6%) (See Table 1 in Appendix F).

The annual prevalence rate of alcohol use was determined from responses on a 9-point ordinal scale (See Item 17 in Appendix E) of how often within the last year alcohol was used. The average response by all players was between once or twice a month ($M = 4.43$, $SD = 2.01$) with the annual percentage rate being 85.6%. Using a comparison of means, there was no significant difference between captain use ($M = 4.53$, $SD = 2.04$) and non-captain use ($M = 4.40$, $SD = 2.00$), $F(1, 616) = .33$, $p = .57$. When examining the

frequency of annual alcohol use, 12.3% of non-captains reported consuming alcohol three times per week compared to 6.7% of captains. Conversely, 36.5% of captains drank alcohol once a week compared to 26.3% of non-captains (See Table 2 in Appendix F). For captains and non-captains, 33.1% reported no drinking in the past 30 days. Non-captains (28.0%) reported a higher percentage of drinking 1-2 days compared to captains (17.5%) but non-captains (20.0%) reported a lower percentage of drinking 3-5 times in the past 30 days compared to captains (25.2%) In other words, there was a higher percentage of captains drinking more often than non-captains even though the overall percentage rates of drinking within the past 30 days were similar between groups (See Table 3 in Appendix F).

In Table 4 in Appendix F, the data presented indicate the percentage of captains and non-captains by how many drinks per week they had as well as the total percentage for the entire sample. Players' collective binge drinking (those who binged at least once) in the previous 2 weeks of completing the survey was 46.9% (Captains = 50%, Non-captains = 46.3%). Of interest, 16.3% of captains reported binge drinking 3-5 times over the previous 2 weeks of the survey compared to 11.5% of the non-captains (See Table 5 in Appendix F). Athletes also responded to typical frequency of binge drinking out of season. A comparison of percentages showed that captains' binge drank (71.2%) slightly more than the non-captains (70.2%) with a total rate of 70.3% binge drinking when not in season (See Table 6 in Appendix F). Of most interest, when comparing binge drinking in season and out of season, 11.5% of the non-captains reported binge drinking 3-5 times during the season compared to 25.0% when not in season. Table 7 in Appendix F

presents a summary of the percentages of drinking patterns between both the captains and non-captains.

A series of chi-square analyses was conducted to examine negative consequences related to alcohol use. The 18 consequences listed on the survey represented a variety of personal, academic, legal, health-related, and disciplinary outcomes. Findings for each of the consequences, by team membership (team captain and non-captain) and the entire sample, are shown in Table 8 (Appendix F). In general, there was one negative consequence that was found to be significantly different and that was experiencing a memory loss with captains reporting higher rates (46%) than non-captains (38%) ($\chi^2(5) = 14.76$, $p < .05$). Having had an argument or fight was close to being significant with captains reporting higher rates (41%) than non-captains (37%) ($\chi^2(5) = 10.54$, $p = .06$).

The following consequences had no significant differences between captains and non-captains: hangover ($\chi^2(5) = 1.63$, $p > .05$), poor test score ($\chi^2(5) = 4.96$, $p > .05$), trouble with police ($\chi^2(5) = 8.42$, $p > .05$), damaged property ($\chi^2(5) = 6.28$, $p > .05$), being nauseated or vomited ($\chi^2(5) = 1.76$, $p > .05$), driving under the influence ($\chi^2(5) = 10.02$, $p > .05$), missed class ($\chi^2(5) = 3.07$, $p > .05$), been criticized ($\chi^2(5) = 9.16$, $p > .05$), thought I had a problem ($\chi^2(5) = 6.78$, $p > .05$), later regretted action ($\chi^2(5) = 2.99$, $p > .05$), arrested for DWI or DUI ($\chi^2(2) = 1.97$, $p > .05$), been taken advantage of sexually ($\chi^2(4) = 4.27$, $p > .05$), have taken advantage of someone sexually ($\chi^2(4) = 5.81$, $p > .05$), tried-failed to stop ($\chi^2(4) = 3.57$, $p > .05$), thought about suicide($\chi^2(4) = 1.64$, $p > .05$), and been hurt or injured ($\chi^2(5) = 1.42$, $p > .05$), Of all 18 consequences, hangover (69.2%), nauseated or vomited (60.7%), regretted action later (41.7%), had a

memory loss (39.5%), and had an argument or fight (37.6%) were reported the most often (See Table 8 in Appendix F).

Alcohol Policies

All 42 schools reported having alcohol policies. The NIAAA website provides a direct link to all colleges' alcohol policies available online (http://www.collegedrinkingprevention.gov/policies/mapresults.aspx?D1=MI). The information that was collected from this website included 39 of the 42 schools that were surveyed. The additional three policies were found on the schools' website. All 42 schools reported a policy that consisted of two components: (a) No persons under the age of 21 will be allowed to consume alcoholic beverages and (b) All persons 21 years or older shall drink alcohol responsibly without disrupting any person around them or serve alcoholic beverages to minors. Of the schools that were not alcohol-free campuses (N = 29) the policy allowed the consumption of alcohol within a person's residence hall room or campus house if over the age of 21 years. In addition to the school alcohol policy, 11 of the 42 teams reported an additional team policy regarding alcohol use. Nine of the 11 teams with an additional alcohol policy reported an abstinence stand during the season while the remaining two had a policy that players who were of legal age could not use alcohol within 24 hours of a practice or a game.

Research Question #1

The first research question "Do team captains use less alcohol and binge drink less than their teammates?" was answered by examining three drinking variables which

included the average number of drinks per week, number of times an athlete had five or more alcoholic drinks during the past 2 weeks and an overall alcohol use index that combined the first two variables with how often during the past year the athlete used alcohol and how often in the past month the athlete used alcohol.

Average number of drinks per week. To find out whether or not differences existed in the average number of drinks per week between all captains and non-captains with disregard to nesting, a comparison of means was conducted. Results showed that there was little difference between the two group's average number of drinks per week. Team captains reported that they drank slightly more than the non-captains, $F(1, 615) = .24$, $p = .63$. See Table 9.

TABLE 9

Comparison of Alcohol Patterns Between Captains and Non-Captains.

	Captains (*N* = 104)	**Non-Captains** (*N* = 514)
Average drinks per week	4.13	3.82
SD	6.64	5.69
Average binge drinking in Last 2 Weeks	2.00	1.89
SD	1.21	1.18
Average alcohol index Score	0.08	-0.01
SD	1.05	0.99

Note. Average times binge drinking in the last 2 weeks (Item 14), 1= none, 2 = once, 3 = twice, 4 = 3 -5 times, 5= 6 - 9 times, 6 = 10+ times.

Binge drinking. In addition to exploring the difference in average number of drinks between captains and non-captains, the number of times binge drinking (operationally defined as the consumption of five or more alcoholic drinks in a sitting) occurred during the last 2 weeks was also examined. Results showed no significant differences, $F(1, 617) = .76$, $p = .38$). Team captains reported that they binge drank once over the past 2 weeks while non-captains' reported on average slightly less than once over the previous 2 weeks (See Table 9).

Alcohol use. Alcohol use by captains and non-captains also was examined with the alcohol use index. Results showed no difference between the captains' scores and the non-captains' scores, $F(1, 614) = .80$, $p = .37$ (See Table 9).

Overall, findings suggest that there is no significant difference in the alcohol patterns between the collective scores of captains and non-captains. Even though statistically the results were not significant, captains' scores were all slightly higher in all three categories: average number of drinks per week, binge drinking, and overall alcohol use.

Research Questions #2-4

Descriptive statistics. To examine Research Questions 2, 3, and 4, alcohol use data among the non-captains were aggregated to the team level. To better understand the range of means from the 42 teams that were included in this study, a number of mean comparisons were made (See Table 10). The average team mean score for average number of drinks per week was about four drinks per week. The means ranged from no drinks per week to 11 drinks per week. Average binge drinking over the past 2 weeks

across teams was one time. Team mean binge drinking ranged from no binge drinking over the past 2 weeks to binge drinking 2-3 times. There were three teams that reported no binge drinking while two teams averaged 2-3 times of binge drinking over the past 2 weeks. The average use index also indicates a wide range of team scores. All three of these variables show that the team's alcohol patterns ranged from abstinence to drinking quite frequently with a high quantity of alcohol (See Table 10).

TABLE 10

Summary of the Mean Comparisons of Team Drinking Patterns

	Range	Minimum	Maximum	μ	*SD*
Average drinks per weeks by team	10.87	0.00	10.87	3.87	2.61
Average binge drinking in the last 2 weeks by team	2.33	1.00	3.33	1.93	0.63
Average alcohol index score by team	2.28	-1.12	1.16	0.01	0.55

N = 42

Note. Average times binge drinking in the last 2 weeks (Item 14), 1= none, 2 = once, 3 = twice, 4 = 3 -5 times, 5= 6 - 9 times, 6 = 10+ times.

HLM. The Intraclass Correlation (ICC) for non-captain use was calculated to determine the proportion of variance that was due to between team differences. The ICC was .22, which suggests that 78% of the variance in team members' alcohol use was due to within-team differences. This means that non-captain's alcohol use was influenced by their unique team environment and HLM was appropriate to use. Table 11 lists the results of the multilevel model for non-captain's alcohol use. The conditional model was

subjected to a simultaneous multiple regression analysis with captains' use, coach's emphasis, and team's additional alcohol policy as predictors of (excluding captains) aggregated non-captains' alcohol use.

Research Question #2

Does captains' alcohol use predict the alcohol use of other members on their teams? Results indicated that the only significant predictor of non-captains' use was captains' use. Because the data were standardized, the size of the beta was .38 which can be interpreted as moderate. Therefore, within each team, the captains' alcohol use had a moderately sized relationship with non-captains' use on average. (See Table 11).

Research Question #3

Does a coach's emphasis on alcohol policy adherence predict the alcohol use of the non-captains on their teams? The coach's emphasis did not have a significant size beta (-.09) which is interpreted as the number of times the coach talked about adhering to the alcohol policy and how a coach would follow up if she/he had knowledge of a violation. The coach's emphasis showed no relationship with non-captains' alcohol use.

TABLE 11

Hierarchical Linear Models in Which Alcohol Use of Non Captains Was the Dependent Variable

	Final estimation of fixed effects				
Model	Coefficient	SE	t	df	p
Captain's Alcohol Use*	0.38	0.07	4.96	38	0.00
Coach's Emphasis	-0.09	0.12	-0.75	38	0.46
Team Alcohol Policy	-0.20	0.18	-1.11	38	0.28

	Final estimation of variance components for random effects				
	SD	Variance	df	x	p
Intercept 1	0.32	0.10	38	98.87	0.00
Level 1	0.88	0.77			

*p < .05.

Research Question #4

Does a team's additional alcohol policy predict the alcohol use of the non-captains on the team representing that institution? On average within each team, the team's alcohol policy beta (-.20) had a very small-sized relationship with non-captain's use. This was measured by differentiating between teams that had an additional alcohol policy in addition to that of the institution and those that did not.

Chapter 5

DISCUSSION

The main contribution of this study to the literature is that team captains' alcohol use significantly predicts the alcohol use of members of their team. Past research has failed to consider the unique influences that occur within teams. Although Leichliter et al. (1998) found that female team captains and other team members used alcohol to a similar extent, they could not determine if captains use predicted team members' use because they ignored the within team differences. In addition, although captains' alcohol use does moderately predict alcohol use of members of their team, there are other variables that influence team members alcohol use that need to be investigated and identified. One of these other variables might involve social factors. Athletes tend to socialize 2 more hours per day than non-athletes (Nelson & Wechsler, 2001) and are continually exposed to more social settings that promote alcohol use than non-athletes (Stainback, 1997). Another variable that could account for team members' alcohol use is the overpowering message that the alcohol industry portrays of alcohol with sports (Wadler & Hainline, 1989). Because of the correlational nature of this study, it is possible that the correlational influence was reversed. That is, non-captains could be the ones who influenced captains to drink. However, given the nature of the literature on peer leaders and their influence, the predictive ordering of leaders influencing followers seems justified.

It should also be noted that this relationship could show a positive correlation with the influence of upperclassmen (who are usually the captains) on drinking behaviors of underclassmen. That is, maybe the athletes who are influencing underclassmen to

drink are actually the upperclassmen and not the captains. After taking a closer look at the data on the level of grade of the captains, it came as no surprise that the highest percentage of the captains were upperclassmen (Seniors = 45; Juniors = 38). However, there were also underclassman represented (Sophomores = 19; Freshmen = 3). It should be also noted that softball teams typically will have more underclassmen on their rosters because most college programs do not run junior varsity programs.

There were three teams in which its members reported not drinking alcohol. After examining these three teams there were no consistent characteristics among the teams. One of the two teams represented a private, Christian school; one of the three teams had a head coach who was the dean of students in charge of discipline; all three had a different make up of classes of players; all three were from different states; one of the teams had an additional alcohol policy besides the athletic department policy. It might be important in future research to case study these teams and talk with individuals on these teams to find out the reasons for choosing not to engage in alcohol drinking. However, this purpose of the present study was to see if there was a correlation between captains and non-captains drinking patterns. Further research should address some of the reasons why this correlation exists

The findings regarding Question #1- "Do team captains use less alcohol and binge drink less than their teammates?" indicate that the number of drinks that these female softball players consumed per week was similar to what previous studies had found (Leichliter et al., 1998; Wechsler et al., 1998) with female athletes in general but around two drinks more on average compared to what has been found with college non-athletes (Leichliter et al., 1998; Wechsler, 2003). Binge drinking occurred at a similar rate (46%

and 50%, respectively) to other research studies that measure binge drinking in athletes and athletes in leadership positions (Leichliter et al., 1998; Nelson & Wechsler, 2003), but less than what has been found with female sorority members (56%) (Meilman, Leichliter, & Presley, 1999; Plucker & Teed, 2003). These trends were similar to the results of this study in binge drinking rates as well (captains 50%, non-captains 46.3%). The only study that addressed alcohol patterns in athletes in leadership roles among several sports, reported that female captains binge drank 49% of the times they consumed alcohol during the previous 2 weeks while their non-captain counterpart binged 47% over the same time period (Leichliter et al., 1998). Thus, this sample was not atypical of female athletes in other sports and at different institutions. However, the prevalence rate is still alarming and indicates the need for more influential programs. While the results of the present study suggest that much work needs to be completed to reduce alcohol abuse in the female college athlete population, examining the relationship of athletes within their team would be an important step for the future. For instance, captains may influence their teammates' drinking directly and/or indirectly (Borsari & Carey, 2001). They may command, encourage, or discourage directly or model indirectly. Teammates' perceived norms about drinking behavior within the team may also play a role. These variables would be important next steps to examine using HLM methodology before attempting to design prevention strategies.

The findings regarding Question #3- "Does a coach's emphasis on alcohol policy adherence predict the alcohol use of the non-captains on their teams?" provide no support for the relationship between how many times a coach emphasized an alcohol policy and the team's alcohol use. In other words, it did not matter how many times a coach talked

to his/her team about an alcohol policy. One would hope that the more times the coach stressed obeying an alcohol policy or talked to his/her players about not drinking alcohol the less likely the team would engage in alcohol use. One explanation for this result is that the survey did not address how much the players liked or respected their coach. One could speculate that on the teams where the players liked and respected their coach there would be a relationship with the coach's emphasis. Another explanation could be that the college drinking culture is not influenced much by adults. These are issues that need to be addressed in future research.

Results for Question #4 – "Does a team's additional alcohol policy predict the alcohol use of the non-captains on the team representing that institution?" showed very little correlation between a team's additional alcohol policy and the team's alcohol use. All teams reported a school alcohol policy while there were 11 teams that instilled an additional alcohol policy during the season. Nine of the schools reported an abstinence policy during the season for all members of their team while the remaining two teams had a policy for players of legal age of no drinking within 24 hours of a game or practice.

The current findings make an important contribution to the understanding of alcohol patterns at the individual and team level in Division III softball teams. These findings advance the literature on the topic of college athletes' alcohol patterns, particularly among female athletes and teams. Female college students, including female college athletes are showing increases in heavy, problematic drinking (Leichliter et al., 1998; NIAAA, 2002; Presley et al., 1998; Wechsler, et al., 2003). This is particularly disconcerting given the facts that alcohol consumption makes women more intoxicated quicker than men and therefore more vulnerable to experiencing alcohol-related

consequences including rape, unprotected sexual intercourse, assault, pregnancy, and many more.

To date, research has shown that there are few successful prevention techniques or programs that have helped decrease heavy episodic drinking by college athletes (Barnett et al., 1996; Haines & Spear, 1996; Peeler et al., 2000). However, most prevention programs have failed to use a comprehensive program that targets the institution as a whole, includes the subgroups of students including freshmen, members of athletic teams, members of the Greek system, and individual problem drinkers (NIAAA, 2002).

In step with the NIAAA, the findings from the current study suggest that prevention programs that focus on team captains and their influence on team members could be more successful in curbing heavy alcohol use by athletes. Therefore, prevention strategies with college athletes need to start with addressing the captains' alcohol patterns. Prevention and intervention researchers might take their cue from research on peer education. Academic and student affairs leaders have advocated for the development of peer education for a long time. In fact, Hunt (2004) states:

> "Academic and student affairs leaders long have acknowledged that much of students' learning takes place in cocurricular and extracurricular settings dominated by their peers. That fact has quietly grown in importance in recent years as educators, student affairs leaders, and student health officials increasingly have recognized that peers can play a particularly important role in dealing with students' problems involving such things as alcohol abuse, drug use, sexual assaults, and sexually transmitted diseases" (p. 40).

The NIAAA (2002) also had some recommendations for peer leadership in helping with problem drinking on campuses because peers not only have first-hand experience about their peers' behavior but because they are also the most trusted by their classmates. This trust may especially hold true in an athletic team group. According to

Hunt (2004), peer leadership has also been targeted for funding by the Centers for Disease Control and Prevention, the U.S. Department of Education, and the National Highway Traffic Safety Administration.

In peer education programs, peer leaders can assist in the multiple "teachable moments" that occur on a day-to-day basis by informally talking to classmates, teammates, and roommates. These informal settings that might include sports fields, dorm rooms, classrooms, and parties as well as other social events can have an enormous positive impact (Hunt, 2004). Peer leaders also coordinate the discussions and activities in more formal settings as well. In one such successful program, female high school athletes participated in a season-long peer-led program to encourage healthy behaviors and target issues such as disordered eating, diet pill use, drug use, body dissatisfaction, depression, and the media's portrayal of women. Those who participated in the program were less likely to participate in these unhealthy behaviors and thought patterns (Eliot et al., 2004). Botvin, Baker, Renick, Filazzola, and Botvin, (1984), using 7th graders conducted a 20-session substance abuse prevention program to reduce interpersonal pressure to smoke, drink excessively, or use cannabis. Results showed the peer-led programs were statistically superior to teacher-led and control groups in reducing pressure to use all substances. In another study conducted in four different countries, using peer-led intervention groups and teacher-led groups, researchers found peer-led programs demonstrated significantly lower alcohol scores than from the teacher-led or control groups (Perry & Grant, 1988).

In addition, the literature on resistance skills should also be incorporated within the group setting. Since it has been found that students who are more socially secure and

have an established group of friends have better resistance skills to alcohol (Shore et al., 1983) alcohol educators and coaches could promote and help develop a high level of cohesion between teammates within the group. These approaches tailored to the specific issues of female athletes, may help to decrease the alcohol use patterns in this group.

Along with focusing on captains and peer leadership in athlete prevention programs, it would be important to also educate athletes on the effects of alcohol use on performance. Researchers have found that even small to moderate alcohol use decreases performance of pyschomotor skills (American College of Sports Medicine, 1982) and aerobic activity (O'Brien, 1991). It also has been found to impair temperature regulation during prolonged exercise in cold environment (O'Brien, 1991), weaken the pumping force of the heart (Lang et al., 1985), and an increase in injury rates (O'Brien & Lyons, 2000).

Finally, researchers have also found that athletes tend to drink less often than non-athletes but when they drink they drink more. Furthermore, non-athletes drink through the whole week while athletes tend to mainly drink on the weekends. One reason why this might be could be because there is not much time during the week due to the amount of time taken for training, traveling to away contests, and fitting in school work. Then when they have a little extra time on the weekend they make up for the lack of drinking during the week.

Limitations

A few limitations in this study are worth noting. First, as with most survey research, a common method bias may be present because all data were self-reported. The

classification of respondents into the categories of captain or non-captain was based on students' self-reports. Some athletes may have misinterpreted or misrepresented their leadership roles, although if this occurred it is expected that it happened in only a few cases. In addition, the survey required athletes to provide sensitive information about their alcohol use and involvement in illegal acts such as underage drinking. This information, if revealed, could result in their suspension of athletic involvement and possibly legal action taken. If this were the case, the data would be affected in under-reporting. The survey questionnaires were anonymous to provide the respondents with adequate protection. Secondly, it is important to state that because the teams were not randomly selected, one should not interpret that these results can be transferred to all teams in every sport and in athletes in all divisions.

Future Recommendations

In addition to the noted implications for future research already addressed, the findings of this study suggest avenues for future research in the area of gender. Women may consider the group structure and following the lead of their captains to be more important than male athletes. It is known that men and women think differently about group membership and being on a team. Generally for women, being a part of the team can mean that relationships that form extend outside of the court or field and are interwoven in social settings; whereas for men, being a part of a team means that there are colleagues who share the same goals but in social settings the relationships mainly stay focused on the activities of the team (DeBoer, 2004). Future studies using a

representation of the different sports, different divisions of colleges and including both genders need to be conducted to replicate these findings.

Future research might also broaden the scope of the study to include team cohesion. An investigation examining alcohol patterns within teams and how team cohesion would affect the relationship of captains' alcohol use to their non-captains' use might moderate the relationship. One could speculate that the more cohesive a team is the stronger the relationship of alcohol use between captains and non captains. If they enjoy being together, they will spend more time together outside of the athletic field socializing.

A follow-up to the findings from this dissertation is to conduct qualitative research to pinpoint some reasons why this relationship exists as well as other reasons athletes may or may not decided to misuse alcohol. Other questions to ask would include with whom athletes drink with, what might cause them to drink more or less, and why athletes who do abstains from alcohol choose to do so.

APPENDICES

Appendix A

Alcohol and Drug Survey
Informed Consent Form

You are being asked to participate in a study being conducted by graduate student Amber Warners under the supervision of Dr. Deborah Feltz from Michigan State University. The primary purpose of this study is to examine the different alcohol and drug patterns of Division III softball players in the Midwest. It is hoped that this research project will allow for a better understanding of alcohol and drug patterns in softball athletes at a Division III level.

As part of this study, you are being asked to complete the following questionnaires. It should take approximately 10 minutes to complete. The questions will be specific to the alcohol and drug use and perceptions of group environment over the past year.

Your responses to the questionnaires will remain anonymous; no one will see the responses except for the statisticians from the Core Institute at South Illinois University who will be inserting the questionnaires into the data bank. Results will be based on the answers given by the athletes as a group insuring anonymity of individual responses and particular universities will not be identified. Overall results of the study will be made available to those who are interested at the completion of the project. Your participation in this study does not guarantee any beneficial effects and there will be no risks involved. Your privacy will be protected to the maximum extent allowable by law.

IF YOU ANSWER THE QUESTIONS ON THE ATTACHED QUESTIONNAIRE, SEAL IT IN THE ATTACHED ENVELOPE, AND RETURN IT TO THE PERSON WHO GAVE IT TO YOU, YOU ARE GIVING YOUR CONSENT TO PARTICIPATE IN THIS STUDY.

However, please know that you may withdraw from participation at any time without penalty and you can refuse to answer any questions you want to skip. If you have any questions concerning participation in this study, please contact the study's principal investigator, Dr. Deborah Feltz, at (517) 355-4730 [dfeltz@msu.edu] or Amber Warners at (616) 526-6223 [awarners@calvin.edu]. If you have any questions regarding your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact- anonymously, if you wish, the UCRHIS Chair, Peter Vasilenko, Ph. D., at 517-355-2189 or ucrihs@msu.edu, or regular mail: 202 Olds Hall, East Lansing, MI 48824.

Thank you for your time and cooperation,

_____ Date _____
Dr. Deborah Feltz, Principal Investigator

_____ Date _____
Amber Warners, Graduate Student

Appendix B

Administrator Direction Form

*****PLEASE READ CAREFULLY*****

Instructions for the on-site administrator

1. Please use #2 pencils for completing the surveys.

2. Have athletes take the survey in a controlled setting such as a quite classroom.

3. Have athletes sit far enough apart from to ensure confidentiality and to promote honesty in answering the questions.

4. Do not allow athletes to talk during the taking of the survey or to discuss any portion of the survey while it is being completed.

5. Procedures

   a. Distribute surveys, one pencil and one white envelope to each player.
   b. Once the survey is completed have the athlete put only their surveys into their own envelope and seal it followed by putting it in the larger, group self-addressed, prepaid envelope. They should not include the cover letter (pink) or the page with the attachment questions (yellow).
   c. Once all surveys are turned in, seal the envelope and personally put in the mail.

5. Thank you!!!!!!!!!!!!!!!!!!!!

Appendix C

Phone Script of Initial Contact of Coaches

"Hello, my name is Amber Warners. I am the softball coach at Calvin College in Grand Rapids, Michigan. I am also a graduate student at Michigan State University in the process of completing my Ph.D. I am interested in researching alcohol and drug patterns in Division III softball players. I am wondering if you would be willing to have your team be a part of my research study. The survey would be anonymous and it would take about 15 minutes to complete. I would ask that you have someone like the team manager or athletic trainer administer the survey instead of yourself to minimize the risk of the athletes being afraid the coach will find out or see their responses. May I have a name and contact information for the person who will be administering the survey so I can send them a packet that will include an instruction sheet for the administrator, consent forms, survey and a prepaid, self-addressed envelope for the surveys to be sent? Upon the completion of the surveys, the administrator will need to put it in the mail themselves. The surveys will be sent to the Core Institute who specializes in collecting data on alcohol and drugs. The surveys would be then scanned and the data collected from all the schools would be then sent to me in SPSS data form. I would be happy to send you the overall results of the study when completed."

Appendix D

Additional Questions to the Core Survey

Bubble in the appropriate response at the top, right-hand corner of the Core and Alcohol Survey located in the "For additional use".

A. Are you a team captain or co-captain?

0 Yes
1 No

B. Does your team have its own restrictions in addition to any athletic department alcohol or drug policy?

0 Yes
1 No

C. How many times during the year has your coach talked to the team about obeying an alcohol or drug policy?

0 Zero times
1 one time
2 2-3 times
3 4 or more times

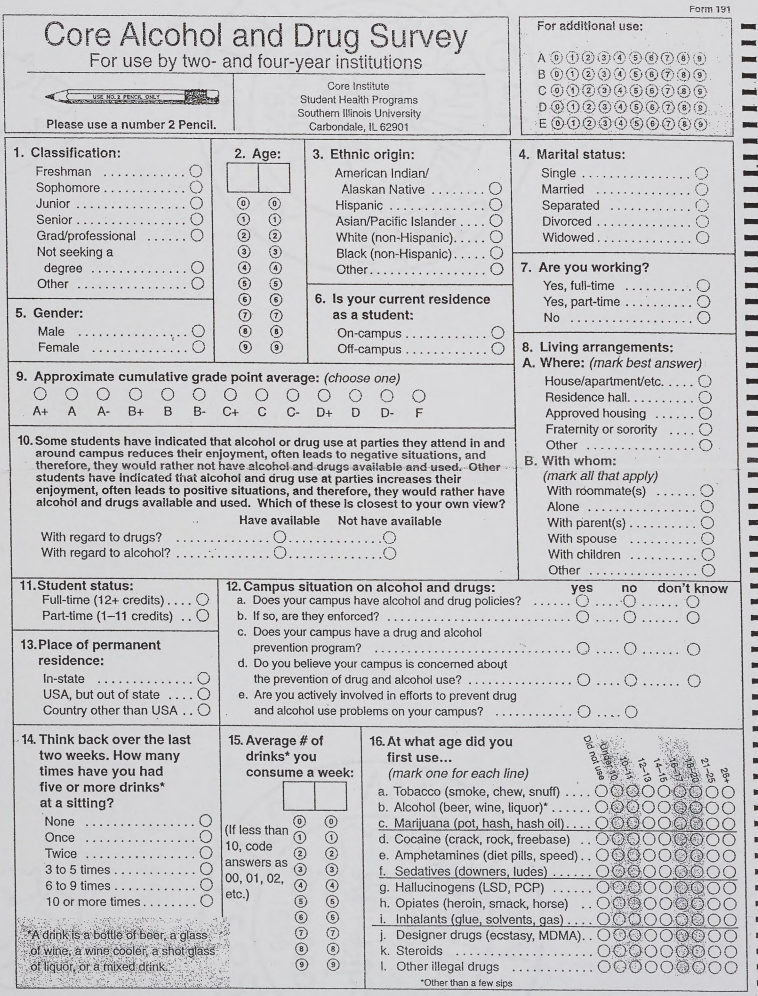
D. If your coach found out any team members had violated the team or school alcohol or drug policy would your coach be more likely to:

0 look the other way
1 confront the member(s) and turn them in
2 confront the member(s) and not turn them in
3 confront the member(s) and punish them outside of the school

E. Think back to when you were out of season. How many times did you have four or more drinks at one sitting over a typical two week span?

0 none
1 once
2 twice
3 3-5 times
4 6-9 times
5 10 or more times

Appendix E
Core Alcohol and Drug Survey



Form 191

Core Alcohol and Drug Survey

For use by two- and four-year institutions

USE NO. 2 PENCIL ONLY

Please use a number 2 Pencil.

Core Institute
Student Health Programs
Southern Illinois University
Carbondale, IL 62901

For additional use:

A 0 1 2 3 4 5 6 7 8 9
B 0 1 2 3 4 5 6 7 8 9
C 0 1 2 3 4 5 6 7 8 9
D 0 1 2 3 4 5 6 7 8 9
E 0 1 2 3 4 5 6 7 8 9

1. Classification:
Freshman ○
Sophomore ○
Junior ○
Senior ○
Grad/professional ○
Not seeking a degree ○
Other ○

2. Age:

0 0
1 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9

3. Ethnic origin:
American Indian/ Alaskan Native ○
Hispanic ○
Asian/Pacific Islander ○
White (non-Hispanic) ○
Black (non-Hispanic) ○
Other ○

4. Marital status:
Single ○
Married ○
Separated ○
Divorced ○
Widowed ○

5. Gender:
Male ○
Female ○

6. Is your current residence as a student:
On-campus ○
Off-campus ○

7. Are you working?
Yes, full-time ○
Yes, part-time ○
No ○

8. Living arrangements:
A. Where: *(mark best answer)*
House/apartment/etc. ○
Residence hall. ○
Approved housing ○
Fraternity or sorority ○
Other ○

B. With whom:
(mark all that apply)
With roommate(s) ○
Alone ○
With parent(s) ○
With spouse ○
With children ○
Other ○

9. Approximate cumulative grade point average: *(choose one)*

○ A+ ○ A ○ A- ○ B+ ○ B ○ B- ○ C+ ○ C ○ C- ○ D+ ○ D ○ D- ○ F

10. Some students have indicated that alcohol or drug use at parties they attend in and around campus reduces their enjoyment, often leads to negative situations, and therefore, they would rather not have alcohol and drugs available and used. Other students have indicated that alcohol and drug use at parties increases their enjoyment, often leads to positive situations, and therefore, they would rather have alcohol and drugs available and used. Which of these is closest to your own view?

	Have available	Not have available
With regard to drugs?	○	○
With regard to alcohol?	○	○

11. Student status:
Full-time (12+ credits) ○
Part-time (1–11 credits) ○

12. Campus situation on alcohol and drugs:

	yes	no	don't know
a. Does your campus have alcohol and drug policies?	○	○	○
b. If so, are they enforced?	○	○	○
c. Does your campus have a drug and alcohol prevention program?	○	○	○
d. Do you believe your campus is concerned about the prevention of drug and alcohol use?	○	○	○
e. Are you actively involved in efforts to prevent drug and alcohol use problems on your campus?	○	○	

13. Place of permanent residence:
In-state ○
USA, but out of state ○
Country other than USA ○

14. Think back over the last two weeks. How many times have you had five or more drinks* at a sitting?
None ○
Once ○
Twice ○
3 to 5 times ○
6 to 9 times ○
10 or more times ○

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

15. Average # of drinks* you consume a week:

(If less than 10, code answers as 00, 01, 02, etc.)

0 0
1 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9

16. At what age did you first use...
(mark one for each line)

	Did not use	Under 10	10–11	12–13	14–15	16–17	18–20	21–25	26+
a. Tobacco (smoke, chew, snuff)	○	○	○	○	○	○	○	○	○
b. Alcohol (beer, wine, liquor)*	○	○	○	○	○	○	○	○	○
c. Marijuana (pot, hash, hash oil)	○	○	○	○	○	○	○	○	○
d. Cocaine (crack, rock, freebase)	○	○	○	○	○	○	○	○	○
e. Amphetamines (diet pills, speed)	○	○	○	○	○	○	○	○	○
f. Sedatives (downers, ludes)	○	○	○	○	○	○	○	○	○
g. Hallucinogens (LSD, PCP)	○	○	○	○	○	○	○	○	○
h. Opiates (heroin, smack, horse)	○	○	○	○	○	○	○	○	○
i. Inhalants (glue, solvents, gas)	○	○	○	○	○	○	○	○	○
j. Designer drugs (ecstasy, MDMA)	○	○	○	○	○	○	○	○	○
k. Steroids	○	○	○	○	○	○	○	○	○
l. Other illegal drugs	○	○	○	○	○	○	○	○	○

*Other than a few sips

17. Within the last year about how often have you used... *(mark one for each line)*

	Did not use	Once or twice	6 times/year	Once/month	Two/month	Once/week	3 times/week	5 times/week	Every day
a. Tobacco (smoke, chew, snuff)	○	○	○	○	○	○	○	○	○
b. Alcohol (beer, wine, liquor)	○	○	○	○	○	○	○	○	○
c. Marijuana (pot, hash, hash oil)	○	○	○	○	○	○	○	○	○
d. Cocaine (crack, rock, freebase)	○	○	○	○	○	○	○	○	○
e. Amphetamines (diet pills, speed)	○	○	○	○	○	○	○	○	○
f. Sedatives (downers, ludes)	○	○	○	○	○	○	○	○	○
g. Hallucinogens (LSD, PCP)	○	○	○	○	○	○	○	○	○
h. Opiates (heroin, smack, horse)	○	○	○	○	○	○	○	○	○
i. Inhalants (glue, solvents, gas)	○	○	○	○	○	○	○	○	○
j. Designer drugs (ecstasy, MDMA)	○	○	○	○	○	○	○	○	○
k. Steroids	○	○	○	○	○	○	○	○	○
l. Other illegal drugs	○	○	○	○	○	○	○	○	○

18. During the past 30 days on how many days did you have: *(mark one for each line)*

	0 days	1–2 days	3–5 days	6–9 days	10–19 days	20–29 days	All 30 days
a. Tobacco (smoke, chew, snuff)	○	○	○	○	○	○	○
b. Alcohol (beer, wine, liquor)	○	○	○	○	○	○	○
c. Marijuana (pot, hash, hash oil)	○	○	○	○	○	○	○
d. Cocaine (crack, rock, freebase)	○	○	○	○	○	○	○
e. Amphetamines (diet pills, speed)	○	○	○	○	○	○	○
f. Sedatives (downers, ludes)	○	○	○	○	○	○	○
g. Hallucinogens (LSD, PCP)	○	○	○	○	○	○	○
h. Opiates (heroin, smack, horse)	○	○	○	○	○	○	○
i. Inhalants (glue, solvents, gas)	○	○	○	○	○	○	○
j. Designer drugs (ecstasy, MDMA)	○	○	○	○	○	○	○
k. Steroids	○	○	○	○	○	○	○
l. Other illegal drugs	○	○	○	○	○	○	○

19. How often do you think the average student on your campus uses... *(mark one for each line)*

	Never	Once or twice	6 times/year	Once/month	Two/month	Once/week	3 times/week	5 times/week	Every day
a. Tobacco (smoke, chew, snuff)	○	○	○	○	○	○	○	○	○
b. Alcohol (beer, wine, liquor)	○	○	○	○	○	○	○	○	○
c. Marijuana (pot, hash, hash oil)	○	○	○	○	○	○	○	○	○
d. Cocaine (crack, rock, freebase)	○	○	○	○	○	○	○	○	○
e. Amphetamines (diet pills, speed)	○	○	○	○	○	○	○	○	○
f. Sedatives (downers, ludes)	○	○	○	○	○	○	○	○	○
g. Hallucinogens (LSD, PCP)	○	○	○	○	○	○	○	○	○
h. Opiates (heroin, smack, horse)	○	○	○	○	○	○	○	○	○
i. Inhalants (glue, solvents, gas)	○	○	○	○	○	○	○	○	○
j. Designer drugs (ecstasy, MDMA)	○	○	○	○	○	○	○	○	○
k. Steroids	○	○	○	○	○	○	○	○	○
l. Other illegal drugs	○	○	○	○	○	○	○	○	○

20. Where have you used... *(mark all that apply)*

	Never used	Occasionally	Residence hall	Fraternity/sorority	Bar/restaurant	Workplace	Private parties	Fine dining	Other
a. Tobacco (smoke, chew, snuff)	○	○	○	○	○	○	○	○	○
b. Alcohol (beer, wine, liquor)	○	○	○	○	○	○	○	○	○
c. Marijuana (pot, hash, hash oil)	○	○	○	○	○	○	○	○	○
d. Cocaine (crack, rock, freebase)	○	○	○	○	○	○	○	○	○
e. Amphetamines (diet pills, speed)	○	○	○	○	○	○	○	○	○
f. Sedatives (downers, ludes)	○	○	○	○	○	○	○	○	○
g. Hallucinogens (LSD, PCP)	○	○	○	○	○	○	○	○	○
h. Opiates (heroin, smack, horse)	○	○	○	○	○	○	○	○	○
i. Inhalants (glue, solvents, gas)	○	○	○	○	○	○	○	○	○
j. Designer drugs (ecstasy, MDMA)	○	○	○	○	○	○	○	○	○
k. Steroids	○	○	○	○	○	○	○	○	○
l. Other illegal drugs	○	○	○	○	○	○	○	○	○

21. Please indicate how often you have experienced the following due to your drinking or drug use during the last year... *(mark one for each line)*

	Never	Once	2–5 times	6–9 times	10 or more times
a. Had a hangover	○	○	○	○	○
b. Performed poorly on a test or important project	○	○	○	○	○
c. Been in trouble with police, residence hall, or other college authorities	○	○	○	○	○
d. Damaged property, pulled fire alarm, etc.	○	○	○	○	○
e. Got into an argument or fight	○	○	○	○	○
f. Got nauseated or vomited	○	○	○	○	○
g. Driven a car while under the influence	○	○	○	○	○
h. Missed a class	○	○	○	○	○
i. Been criticized by someone I know	○	○	○	○	○
j. Thought I might have a drinking or other drug problem	○	○	○	○	○
k. Had a memory loss	○	○	○	○	○
l. Done something I later regretted	○	○	○	○	○
m. Been arrested for DWI/DUI	○	○	○	○	○
n. Have been taken advantage of sexually	○	○	○	○	○
o. Have taken advantage of another sexually	○	○	○	○	○
p. Tried unsuccessfully to stop using	○	○	○	○	○
q. Seriously thought about suicide	○	○	○	○	○
r. Seriously tried to commit suicide	○	○	○	○	○
s. Been hurt or injured	○	○	○	○	○

22. Have any of your family had alcohol or other drug problems: *(mark all that apply)*

- ○ Mother
- ○ Father
- ○ Stepmother
- ○ Stepfather
- ○ Brothers/sisters
- ○ Mother's parents
- ○ Father's parents
- ○ Aunts/uncles
- ○ Spouse
- ○ Children
- ○ None

23. If you volunteer any of your time on or off campus to help others, please indicate the approximate number of hours per month and principal activity:

- ○ Don't volunteer, or less than 1 hour
- ○ 1–4 hours
- ○ 5–9 hours
- ○ 10–15 hours
- ○ 16 or more hours

Principal volunteer activity is: _____

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Appendix F

TABLES

TABLE 1
Percentage of Reported Age of First Use of Alcohol

The Reported Age Of First Alcohol Use	Percentage		
	Non-Captain (N=513)	Captain (N = 104)	Total (N = 617)
Never	12.5	14.4	12.8
Under 10	0.6	0.0	0.5
10-11	1.0	0.0	0.8
12-13	4.5	8.7	5.2
14-15	17.8	14.4	17.2
16-17	30.7	24.0	29.5
18-20	31.6	36.5	32.5
21-25	1.4	1.9	1.5

TABLE 2
Percent of Frequency of Alcohol Use in the Past Year

Frequency of Reported Alcohol Use Within the Past Year	Percentage		
	Non-Captain (N=514)	Captain (N = 104)	Total (N = 618)
Never used	14.0	16.3	14.4
Once/year	7.4	3.8	6.8
6 times/year	13.2	10.6	12.8
Once/month	8.8	7.7	8.6
Twice/month	16.9	15.4	16.7
Once/week	26.3	36.5	28.0
3 times/week	12.6	6.7	11.7
5 times/week	0.8	2.9	1.1

TABLE 3
Percentage of Alcohol Use in the Past 30 Days

Number of Times Reported Drinking in Past 30 Days	Percentage		
	Non-Captain (N=513)	Captain (N = 104)	Total (N = 617)
0 Days	32.7	35.0	33.1
1-2 Days	28.0	17.5	26.3
3-5 Days	20.0	25.2	20.9
6-9 Days	13.2	12.6	13.1
10-19 Days	5.8	8.7	6.3
20-29 Days	0.2	1.0	0.3

TABLE 4
Percentages of Collegiate Softball Players by Number of Drinks Per Week

Drinks Per week	Percentage		
	Non-Captain (N=513)	Captain (N = 104)	Total (N = 617)
0	39.0	32.7	37.9
1	13.1	9.6	12.5
2	8.0	9.6	8.3
3	4.9	9.6	5.7
4	3.7	6.7	4.2
5	7.8	8.7	7.9
6	3.1	2.9	3.1
7	1.9	3.8	2.3
8	2.3	1.9	2.3
9	0.8	2.9	1.1
10	5.5	3.8	5.2
11	0.8	0.0	0.6
12	1.8	2.9	1.9
13	0.4	0.0	0.3
14	0.6	0.0	0.5
15	2.7	1.9	2.6
16	0.2	1.0	0.3
18	0.4	0.0	0.3
20	1.2	0.0	1.0
21	0.4	0.0	0.3
22	0.2	0.0	0.2
24	0.2	0.0	0.2
25	0.2	0.0	0.2
26	0.2	0.0	0.2
30	0.2	0.0	0.2
35	0.4	0.0	0.3
40	0.2	1.0	0.3
45	0.0	1.0	0.2

TABLE 5
Binge Drinking Percentages Within the Past 2 Weeks
(In Season Binge Drinking)

Number of Times Reported Binge Drinking Past Two Weeks	Percentage		
	Non-Captain (N=513)	Captain (N = 104)	Total (N = 617)
None	53.7	50.0	53.1
One Time	21.2	20.2	21.0
Twice	10.9	11.5	11.0
3-5 Times	11.5	16.3	12.3
6-9 Times	2.1	1.9	2.1
10 or More Times	0.6	0.0	0.5

TABLE 6
Binge Drinking Percentages Out of Season

Number of Times Reported Binge Drinking Out Of Season	Percentage		
	Non-Captain (N=513)	Captain (N = 104)	Total (N = 617)
None	29.8	28.8	29.7
One Time	16.8	14.4	16.4
2 Times	20.9	32.7	22.9
3-5 Times	25.0	19.2	24.0
6-9 Times	5.8	3.8	5.5
10 or More Times	1.8	1.0	1.6

TABLE 7
Percentages of Alcohol Use of College Softball Teams

Type of Drinking Behavior	Percentage		
	Non-Captain (N=513)	Captains (N = 104)	Total (N = 617)
Use of Alcohol Within Last Year	86.0	83.7	85.6
Use of Alcohol Within Past 30 Days	67.3	65.0	66.9
Five or More Drinks in One Sitting Within the Past Two Weeks (In Season Binge Drinking)	46.3	50.0	46.9
Five or More Drinks In Once Sitting Within A Typical Two Week Period Out of Season	70.2	71.2	70.3

TABLE 8
Percentage of Softball Players Experiencing Consequences Resulting From Alcohol Use in the Last Year

	Non-Captain	Team Captain	Total
Hangover	68.4	73.1	69.2
Poor Test Score	23.0	18.3	22.2
Trouble with Police	19.1	12.5	18.0
Damaged Property	4.7	7.7	5.2
Argument or Fight	37.0	40.6	37.6
Nauseated or Vomited	59.6	66.3	60.7
Driven Under Influence	22.8	24.0	23.0
Missed Class	33.9	36.9	34.4
Been Criticized	32.4	31.7	32.3
Thought I Had A Problem	7.3	1.9	6.4
Had a Memory Loss*	38.2	46.2	39.5
Later Regretted Action	42.0	40.4	41.7
Arrested for DWI or DUI	0.6	1.0	0.6
Have Been Taken Advantage of Sexually	10.8	9.6	10.6
Have Taken Advantage of Someone Sexually	2.3	3.9	2.6
Tried- Failed to Stop	2.9	5.8	3.4
Thought About Suicide	2.5	1.0	2.3
Been Hurt or Injured	14.4	12.5	14.1

*$p<.05$

REFERENCES

REFERENCES

Adams, C., & Nagoshi, C.T. (1999). Changes over one semester in drinking game playing and alcohol use and problems in a college sample. *Substance Abuse*, 20, 97-106.

Alva, S.A. (1998). Self-reported alcohol use of college fraternity and sorority members. *Journal of College Student Development*, 39, 3-10.

American College of Sports Medicine (1982). American College of Sports Medicine position statement on the use of alcohol in sport. *Medical Science of Sports and Exercise*, 14, ix-x.

Anderson, W.A., Albrecht, R.R., & McKeag, D.B. (1993). *Second Replication of a National Study of the Substance Use and Abuse Habits of College Student-Athletes. Report to the NCAA.* Mission, KS: National Collegiate Athletic Association.

Anderson, W.A., Albrecht, R.R., McKeag, D.B., Hough, D.O., & McGrew, C.A. (1991). A national survey of alcohol and drug use by college athletes. *The Physician and Sportsmedicine*, 19(2), 91-104.

Anderson, W.A., & McKeagh, D.B. (1985*). Substance use and abuse habits of college student athletes.* Mission, KS: National Collegiate Athletes Association.

Anderson, W.A., & McKeagh, D.B. (1989*). Replication of the national study of the substance use and abuse habits of college student athletes.* Mission, KS: National Collegiate Athletes Association.

Anderson, W.A., & Snellman, M.A. (1986). *1984-85 NCAA sponsored study of alcohol, drug, and tobacco use among college athletes.* East Lansing, MI: Michigan State University College of Human Medicine.

Archer, J. (1991). *Counseling College Students.* New York: Continuum.

Archer, J., & Cooper, S. (1998). *Counseling and Mental Health Services on Campus.* San Francisco, CA: Jossey-Bass Publishers.

Axtman, K. (2002). Colleges struggle to stem rioting after games. *Christian Science Monitor*, November 29.

Bahr, S.J., Marchos, A.C., & Maughan, S.L. (1995). Family, educational and peer influences on the alcohol use of female and male adolescents. *Journal of Studies on Alcohol*, 56, 457-469.

Baer, J.S. (1994). Effects of college residence on perceived norms for alcohol consumption: An examination of the first year in college. *Psychology of Addictive Behaviors,* 8, 43-50.

Baer, J.S., & Carney, M.S. (1993). Biases in perceptions of the consequences of alcohol among college students. *Journal of Studies on Alcohol*, 54, 54-60.

Baer, J.S., Stacy, A., & Larimer, M. (1991). Biases in perception of drinking norms among college students. *Journal of Studies on Alcohol*, 52, 580-586.

Bakker, D.L. (1996). Religious practices and high-risk behaviors of college student athletes and non-athletes. *Dissertation Abstracts International: Section B: The Sciences and Engineering,* 57(1-B), 0266

Banks, E., & Smith, M.R. (1980). Attitudes and background factors related to alcohol use among college students. *Psychological Reports,* 46, 571-577.

Barnett, L., Far, J., & Mauss, A. (1996). Changing perceptions of peer norms as a drinking reduction program for college students. *Journal of Alcohol and Drug Education*, 41, 39-62.

Bass, B.M. (1990). *Bass & Stogdill's handbook on leadership: Theory, research, and managerial applications* (3rd ed.). New York: The Free Press.

Beal, A.C., Ausiello, J., & Perrin, J.M. (2001). Social influence on health-risk behaviors among minority middle school students. *Journal of Adolescent Health*, 28, 474-480.

Bennis, W.G. (1989). *On becoming a leader.* Cambridge, MA: Perseus Books.

Blane, H.T., & Hewitt, L.E. (1977). Alcohol and youth: An analysis of the literature, 1960-75. (Prepared for the National Institute on Alcohol Abuse and Alcoholism), PB-268 698, Springfield, VA: National Technical Information Service, PB-268 698.

Bond, V., Franks, B.D., & Howlett, E.T. (1983). Effects of small and moderate doses of alcohol on sub-maximal cardiorespiratory function, perceived exertion and endurance performance in abstainers and moderated drinkers. *Journal of sports Medicine and Physical Fitness*, 23, 221-229.

Borsari, B., & Carey, K.B. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance* Abuse, 13, 391-424.

Botvin, G.J., Baker, E., Renick, N.L., Filazzola, A.D., & Botvin, E.M. (1984). A cognitive-behavioral approach to substance abuse prevention. *Addictive Behavior*, 9, 137-147.

Branche, C.M., Sniezek, J.E., & Satin, R.W. (1991). Water recreation-related spinal injuries: risk factors in natural bodies of water. *Accident Annual Preview*, 23, 13-17.

Brennan, A.F., Walfish, S., & AuBuchon, P. (1986). Alcohol use and abuse in college students, II: Social/environmental correlates, methodological issues, and implications for intervention. *International Journal of Addictions*, 21, 475-493.

Brown, B.B., Dolcini, M.M., & Leventhal, A. (1997). Transformations in peer relationships at adolescence: implications for health-related behavior. In J. Schulenberg, J.L. Maggs, & K. Hurrelman (Eds.), *Health risks and development transitions during adolescence.* New York: Cambridge University Press.

Canter, C.A., & Kahnweiler, W.M. (2000). The efficacy of the social norms approach to substance abuse prevention applied to fraternity men. *Journal of American College Health,* 49, 66-71.

Carron, A.V. (1980). *Social Psychology of Sport.* Ithica, NY: Mouvement.

Cashin, J.R., Presley, C.A., & Meilman, P.W. (1998). Alcohol use in the Greek system: Follow the leader? *Journal of Studies on Alcohol*, 59, 63-70.

Centers for Disease Control and Prevention (1997. Youth risk behavior surveillance: National College Health Risk Behavior Survey–United States 1995. *Morbidity and Mortality Weekly Report,* 46(SS6):1–56.

Chappel, J.N. (1987). Drug use and abuse in the athlete. In R.J. May & J.J. Asken (Eds.), *Sport Psychology* (pp.135-148). NY: PMA.

Chelladurai, P. (1999). *Human resource management in sport and recreation.* Champaign, IL: Human Kinetics.

Chelladurai, P., & Saleh, S.D. (1980). Dimensions of leader behavior in sports: Development of a leadership scale. *Journal of Sport Psychology*, 2, 34-45.

Chipperfield, D., & Vogel-Sprott, M. (1988). Family history of problem drinking among young male social drinkers: Modeling effects on alcohol consumption. *Journal of Abnormal Psychology*, 97, 423-428.

Clapp, J.D., & McDonnell, A.L. (2000). The relationship of perceptions of alcohol promotion and peer drinking norms to alcohol problems reported by college students. *Journal of College Student Development*, 41, 19-26.

Clapp, J.D., Russell, C., & DeJong, W. (2001). Done 4 did zip: Evaluating a failed social norms marketing campaign. Paper presented at the Fourth National Conference on the Social Norms Model, Anaheim, CA.

Clement, D.B. (1983). Drug use survey: Results and conclusions. *The Physician and Sportsmedicine*, 9(11), 64-67.

Collins, R.L., Parks, G.A., & Marlatt, G.A. (1985). Social determinants of alcohol consumption: The effects of social interaction and model status on the self administration of alcohol. *Journal of Consulting and Clinical Psychology*, 53, 189-200.

Cooper, A.M., Waterhouse, G.J., & Sobell, M.B. (1979). Influence of gender on drinking in a modeling situation. *Journal of Studies on Alcohol*, 40, 562-570.

Corcoran, K.J. (1995). Cognitive and situational factors predict alcoholic beverage selection. *Addictive Behaviors*, 20, 525-532.

Csikszentmihalyi, M., & Larson, R. (1984). *Being adolescent.* New York: Basic Books.

DeBoer, K.J. (2004). *Gender and competition: How men and women approach work and play differently.* Monterey, CA: Coaches Choice.

DeJong, W. (2001). Finding common ground for effective campus-based prevention. *Psychology of Addictive Behavior*, 15, 292-296.

Dericco, D.A. (1978). Effects of peer majority on drinking rate. *Addictive Behaviors,* 3, 29-34.

Dericco, D.A., & Garlington, W.K. (1977). The effect of modeling and disclosure of experimenter's intent on drinking rate of college students. *Addictive Behaviors*, 2, 135-139.

Dericco, D.A., & Niemann, J.E. (1980). In vivo effects of peer modeling on drinking rate. *Journal of Applied Behavioral Analysis,* 13, 149-152.

Duda, M. (1984). Drug testing challenges college and pro athletes. *The Physician and Sportsmedicine*, 12, 109-116.

Elder, C., Barnes, J., Leaver-Dunn, D., Nagy, S., and Leeper, J. (2002). The influence of group membership on multiple substance use. *Journal of Alcohol & Drug Education*, 47(2), 42-57.

Everett-Jones, S., Oeltmann, J., Wilson, T.W., Brener, N.D., & Hill, C.V. (2001). Binge drinking among undergraduate college students in the United States. *Journal of American College Health*, 50(1), 33-49.

Fitzgerald, J.L., & Arndt, S. (2002). Reference group influence on adolescent alcohol use. *Journal of Alcohol and Drug Education*, 47(2), 42-57.

Fox, E.L. (1984). *Sports Physiology*. Philadelphia, PA: CBS College Publishing.

Frintner, M.P., & Rubinson, L. (1993). Acquaintance rape: The influence of alcohol, fraternity membership, and sports team membership. *Journal of Sex Education and Therapy*, 19, 272-284.

Garlington, W.K., & Dericco, D.A. (1977). The effect of modeling on drinking rate. *Journal of Applied Behavioral Analysis*, 10, 207-211.

Gay, J.E., Minelli, M.J., Tripp, D., & Keilitz, A. (1990). Alcohol and the athlete: A university's response. *Journal of Alcohol and Drug Education,* 35(2), 81-86.

Glider, P., Midyett, S., Mills-Novoa, B. Johannessen, K. & Collins, C. (2001). Challenging the collegiate rite of passage: A campus-wide social marketing media campaign to reduce binge drinking. *Journal of Drug Education*, 31(2), 207-220.

Gloede, B. (1988). What if beer were banned? *Sports Inc.*, February 29, 1988.

Goodhart, F.W., Lederman, L.C., Stewart, L.P., & Laitman, L. (2003). Binge drinking: not the word of choice. *Journal of American College Health,* 52(1), 44-47.

Granfield, R. (2002). Believe it or not: Examining to the emergence of new drinking norms in college. *Journal of Alcohol & Drug Education*, 47(2), 18-32.

Green, G.A., Uryasz, F.D., Petr, T.A., & Bray, D. (2001). NCAA study of substance use and abuse habits of college student-athletes. *Clinical Journal of Sport Medicine,* 11(1), 51-56.

Grossman, S.J. & Smiley, E.B. (1999). APPLE: Description and evaluation of a substance abuse education and prevention program for collegiate athletics. *The Journal of Primary Prevention,* 20(1), 51-59.

Gruenewald, P.J., Johnson, F.W., Light, J.M., Lipton, R., & Saltz, R.F. (2003). Understanding college drinking: Assessing dose response from survey self-reports. *Journal of Studies on Alcohol*, 64(4), 500-515.

Haines, M., & Spear, A. (1996). Changing the perception of the norm: A strategy to decrease binge drinking among college students. *Journal of American College Health*, 45, 134-140.

Heath, G.W., Ford, E.S., & Craven, T.E. (1991). Exercise and the incidence of upper respiratory tract infections. *Medicine Science of Sport and Exercise*, 23,152-157.

Hendricks, R.D., Sobell, M.B., & Cooper, A.M. (1978). Social influences on human ethanol consumption in an analogue situation. *Addictive Behaviors*, 3, 253-259.

Higher Education Center (1997). Be vocal, be visible, and be visionary: Recommendations of college and university presidents on alcohol and other drug prevention. Available from the Higher Education Center for Alcohol and Other Drug Prevention, 55 Chapel Street, Newton, MA.

Hingson, R.W., & Howland, J. (2002). Comprehensive community interventions to promote health: Implications for college-age drinking problems. *Journal of Studies on Alcohol Supplement*, 14, 226-240.

Houmard, J.A., Langenfeld, M.E., & Wiley, R.L. (1987). Effects of the acute ingestion of small amounts of alcohol upon 5-mile run times. *Journal of Sports Medicine and Physician*, 27, 253-257.

Hunt, D. (2004). Peer to peer: Effective college learning. *Change*, 36(3), 40-45.

Jenkins, J.E. (1996). The influence of peer affiliation and student activities on adolescent drug involvement, *Adolescence*, 31(122), 297-307.

Johannessen, K., Collins, C., Mills-Novoa, B. & Glider, P. (2000). A Practical Guide to Alcohol Abuse Prevention: A Campus Case Study in Implementing Social Norms and Environmental Management Approaches. Tucson, Arizona: The University of Arizona.

Johnson, P.B. (1989). Reactions, expectancies, and college student's drinking. *Psychology Report*, 65, 1245-1246.

Johnston, L.D., O'Malley, P.M., & Bachman, J.G. (1994). *National survey results on drug use from the monitoring the future study, 1975-1994: Vol. 2 College students and young adults.* Washington D.C.: U.S. Government Printing Office, NIH Publication 94-3809.

Johnston, L., O'Malley, P., & Bachman, J.D. (2000). National survey results on use from the monitoring the future study, 1975-1999 (Vol. 2). Bethe*SD*a, MD: Dept of Health and Human Resources.

Jung, J.R. (2003). Changing the focus of college alcohol prevention programs. *Journal of American College Health,* 52(2), 92-96.

Keeling, R.P. (2002). Binge drinking and the college environment. *Journal of American College Health,* 50, 197-201.

Klein, H. (1992). College student's attitudes toward the use of alcoholic beverages. *Journal of Alcohol and Drug Education*, 37, 35-52.

Knight, J.R., Wechsler, H., Kuo, M., Seibring, M., Weitzman, E.R., & Schuckit, M.A. (2002). Alcohol abuse and dependence among U.S. college students. *Journal of Studies on Alcohol*, 63(3), 263-270.

Kokotailo, P.D., Henry, B.C., Koscik, R.E., Fleming, M.F., & Landry, G.L. (1996). Substance use and other health risk behaviors in collegiate athletes. *Clinical Journal of Sports Medicine,* 6, 183-189.

Koss, M.P., & Gaines, J.A. (1993). The prediction of sexual aggression by alcohol use, athletic participation and fraternity affiliation. *Journal of Interpersonal Violence*, 8(1), 94-108.

Kouzes, J.M., & Posner, B.Z. (1995). *The leadership challenge: How to keep getting extraordinary things done in organizations*, San Francisco: Jossey-Bass.

Kozub, S.A., & Pease, D.G. (1993). Coach and player leadership in high school basketball. *Journal of Sport Pedagogy*, 7, 1-15.

Larimer, M.E., Iruine, D.L., Kilmer, J.R., & Marlatt, G.A. (1997). College drinking and the Greek System: Examining the role of perceived norms for high-risk behavior. *Journal of College Student Development*, 38, 587-598.

Lang, R.M., Borow, K.M., & Neumann, A. (1985). Adverse cardiac effects of acute alcohol ingestion in young adults. *Annual Internal Medicine*, 102, 742-747.

Leichliter, J.S., Meilman, P.W., Presley, C.A., & Cashin, J.R. (1998). Alcohol use and related consequences among students with varying levels of involvement in college athletics. *Journal of American College Health,* 46(6), 257-262.

Liccione, W.J. (1980). The relative influence of significant others on adolescent drinking: An exploratory study. *Journal of Alcohol and Drug Education,* 25, 55-62.

Lied, E.R., & Marlatt, G.A. (1979). Modeling as a determinant of alcohol consumption: Effect of subject sex and prior drinking history. *Addictive Behaviors*, 4, 47-54.

Lo, C.C. (1995). Gender differences in collegiate alcohol use. *Journal of Drug Issues*, 25, 817-836.

Luther, S.S., & McMahon, T.J. (1996). Peer reputation among inner-city adolescents: Structure and correlates. *Journal of Research on Adolescence*, 6, 581-603.

Lyons, F.P. (1998). *Can regular alcohol consumption increase the risk of injury?* Exeter: University of Exeter.

Mabry, E.A., & Barnes, R.E. (1980). *The dynamics of small group communication.* Englewood Cliffs, NJ: Prentice Hall.

Maisto, S.A., Carey, K.B., & Bradizza, C.M. (1999). Social learning theory. In K.E. Leonard, & H.T. Blane (Eds.), *Psychological theories of drinking and alcoholism* (2nd ed.). New York: Guilford Press.

Martin, C.M., & Hoffman, M.A. (1993). Alcohol expectancies, living environment, peer influence, and gender: A model of college-student drinking. *Journal of College Student Development*, 34, 206-211.

Mason, W.A., & Windle, M. (2001). Family religious, school and peer influences on adolescent alcohol use: A longitudinal study. *Journal of Studies on Alcohol*, 62, 44-53.

Meilman, P.W., Leichliter, M.A., & Presley, C.A. (1999). Greeks and athletes: Who drinks more? *Journal of College Health*, 47, 187-190.

Meindl, J.R. (1990). On leadership: An alternative way to the conventional wi*SD*om. *Research in Organizational Behavior*, 12, 159-203.

Michalodimitrakis, E., & Patsalis, A. (1987). Nitrogen narcosis and alcohol consumption: A scuba diving fatality. *Journal of Forensic Science*, 32, 1095-1097.

Michigan State University, College of Human Medicine (1989). *Replication of the National Study of the Substance Use and Abuse Habits of College Student-athletes*: Final Report. East Lansing, MI: Michigan State University.

Miller-Johnson, S., Costanzo, P.R., Coie, J.D., Rose, M.R., Browne, D.C., & Johnson, C. (2003). Peer social structure and risk-taking behaviors among African American early adolescents. *Journal of Youth and Adolescence*, 32 (5), 375-385.

Mooney, D.K., & Corcoran, L.J. (1991). Personal and perceived peer alcohol expectancies: Their influences on alcohol consumption. *Psychology of Addictive Behaviors*, 5, 85-92.

Nagoshi, C.T. (1999). Perceived control of drinking and other predictors of alcohol use and problems in a college student sample. *Addiction Research*, 7, 291-306.

Nagoshi, C.T., Wood, M.D., Cote, C.C., & Abbit, S.M. (1994). College drinking game participation within the context of other predictors of other alcohol use and problems. *Psychology of Addictive Behaviors*, 8, 203-213.

National Collegiate Athletic Association (NCAA) (1997). *Study of Substance Use and Abuse Habits of College Student-Athletes.* Overland Park, KS.

National Institute on Alcohol Abuse and Alcoholism (NIAAA) (2002). *A Call to Action: Changing the Culture of Drinking at U.S. Colleges*, Retrieved March 10, 2005 from http://www.collegedrinkingprevention.gov/reports/#task.

National Institute on Drug Abuse (1991). *National Household Survey on Drug Abuse: Main Findings 1990*, Rockville, MD: DHHS Publication 91-1788.

Nattiv, A., & Puffer, J.C.D. (1991). Lifestyles and health risk of collegiate athletes. *Journal of Family Practice,* 33(6), 585-590.

Nattiv, A., & Puffer, J.C. (1997). Lifestyles and health risks of collegiate athletes: A multi-center study. *Clinical Journal of Sports Medicine,* 7(4), 262-272.

Nelson, T.F., & Wechsler, H. (2001). Alcohol and college athletes. *Medicine & Science in Sports & Exercise*, 33(1), 43-47.

Nichols, A.W. (1992). Exercise-induced anaphylaxis and urticaria. *Clinical Sports Medicine*, 11, 303-312.

O'Brien, C.P. (1991, March 22). *The demon drink.* Rugby News, p. 24.

O'Brien, C.P. (1993). Alcohol and sport: Impact of social drinking on recreational and competitive sports performance. *Sports Medicine,* 15(2), 71-77.

O'Brien, C.P., & Lyons, F. (2000). Alcohol and the athlete. *Sports Medicine,* 29(6), 295-300.

O'Hare, T.M. (1990). Drinking in college: Consumption patterns, problems, sex differences and legal drinking age. *Journal of Studies on Alcohol*, 51, 536-541.

Olds, R.S., & Thombs, D.L. (2001). The relationship of adolescent perceptions of peer norms and parent involvement to cigarette and alcohol use. *Journal of School Health*, 71, 223-228.

Olgilvie, B.C. (1981). The emotionally disturbed athlete: A round table. *The Physician and Sportsmedicine*, 9, 67-80.

O'Malley, P.M., & Johnston, L.D. (2002). Epidemiology of alcohol and other drug use among American college students. *Journal of Studies on Alcohol Supplement*, 14, 23-39.

Ouellette, J.A., Gerrard, M., Gibbons, F., & Reis-Bergan, M. (1999). Parents, peers and prototypes: Antecedents of adolescent alcohol expectancies, alcohol consumption, and alcohol-related life problems in rural youth. *Psychology of Addictive Behaviors,* 13, 183-197.

O'Toole, T. (2002). Celebratory riots' creating crises on campus. *USA Today*, April 9.

Overman, S.J. & Terry, T. (1991). Alcohol use and attitudes: A comparison of college athletes and non-athletes. *Journal of Alcohol and Drug Education,* 21(2), 107-117.

Page, R.M., Hammermeeister, J., Scanlan, A., & Gilbert, L. (1998). Is school sports participation a protective factor against adolescent health risk behaviors? *Journal of Health Education*, 29(3), 186-192.

Parham, W. (1993). The intercollegiate athlete: A 1990's profile. *The Counseling Psychologist*, 21, 411-429.

Pate, R.R., Heath, G.W., Dowda, M, & Trost, S.G. (1996). Associations between physical activity and other health behaviors in a representative sample of U.S. adolescents. *The American Journal of Public Health,* 86(11), 1577-1582.

Pate, R.P., Trost, S.G., Levin, S., & Dowda, M. (2002). Sports participation and health-related behaviors among US youth. *Archives of Pediatrics &Adolescent Medicine*, 154, 904-911.

Patetta, M.J., & Biddinger, P.W., (1988). Characteristics of drowning deaths in North Carolina. *Public Health Reports*, 103(4), 406-411.

Peeler, C., Far, J., & Miller, J. (2000). An analysis of the effects of a program to reduce heavy drinking among college students. *Journal of Alcohol and Drug Education*, 45, 39-54.

Perkins, H.W. (1997). *College student misperceptions of alcohol and other drug norms among peers: Explaining cases, consequences and implications for prevention programs.* The Higher Education Center for Alcohol and Other Drug Prevention, U.S. Department of Education.

Perkins, H.W., & Berkowitz, A.D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International Journal of Addictions*, 21, 961-976.

Perkins, H.W., Meilman, P.W., Leichliter, J.S., Cashin, J.R., & Presley, C.A. (1999). Misperception of the norms for the frequency of alcohol and other drug use on college campuses. *Journal of American College Health*, 47, 253-258.

Perkins, H.W., & Wechsler, H. (1996). Variation in perceived college drinking norms and its impact on alcohol abuse: A nationwide study. *Journal of Drug Issues*, 26, 961-974.

Perry, C.L., & Grant, M. (1988). Comparing peer-led to teach-led youth alcohol education in four countries. *Alcohol Health Research World*, 12, 322-326.

Perry, C.L., & Kelder, S.H. (1992). Prevention. In Langenbucher, J.W. (Ed.), *Review of addictions: Research and treatment* (Vol. 2). New York: Pergamon Press, 453-472.

Pfeffer, J. (1977). The ambiguity of leadership. *The Academy of Management Review*, January, 104-112.

Plucker, J.A., & Teed, C.M. (2004). Evaluation of an alternative methodology for investigating leadership and binge drinking among sorority members. *Addictive Behaviors*, 29(2), 381-388.

Prentice, D.A., & Miller, D.T. (1993). Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *Journal of Personality and Social Psychology, 64*, 243-256.

Presley, C.A., Leichliter, J.S., & Meilman, P.W. (1998). Alcohol and drugs on American college campuses: A report to college presidents. Third in a series: 1995, 1996, and 1997, Carbondale, IL: Core Institute, Southern Illinois University.

Presley, C.A., Meilman, P.W., & Leichliter, J.S. (2002). College factors that influence drinking. *Journal of Studies on Alcohol*, 63(2), 82-91.

Presley, C.A., Meilman, P.W., & Cashin, J.R. (1996a). *Alcohol and drugs on American college campuses: Use, consequences, and perceptions of the campus environment,* Vol. 4: 1992-1994. Carbondale, IL: Core Institute, Southern Illinois University.

Presley, C.A., Meilman, P.W., Cashin, J.R. & Lyerla, R. (1996b). *Alcohol and drugs on American College Campuses: Use, Consequences, and Perceptions of the Campus Environment,* Vol. 3: 1991-1993. Carbondale, IL: Southern Illinois University.

Presley, C.A., Meilman, P.W., & Lyerla, R. (1993). Alcohol and drug use among residents of Greek houses. *Discoveries: A Bulletin of the Core Institute.* Carbondale, IL: Southern Illinois University.

Rabow, J., & Duncan-Schill, M. (1994). Drinking among college students. *Journal of Alcohol and Drug Education*, 40, 52-64.

Rainey, C.J., McKeown, R.E., Sargent, R.G., & Valois, R.F. (1996). Patterns of tobacco and alcohol use among sedentary, exercising, non-athletic and athletic youth. *Journal of School Health*, 66 (1), 27-33.

Raudenbush, S.W. & Bryk, A.S. (2002). *Hierarchical Linear Models: Applications and Data Analysis Methods* (2nd Ed.). London: Sage Publications, Inc.

Rehm, J., Ashley, M., Room, R., Single, E., Bondy, S., Ferrence, R., & Giesbrecht, N. (1996). On the emerging paradigm of drinking patterns and their social and health consequences. *Addiction,* 91, 1615-1621.

Rodkin, P.C., Farmer, T.W., Pearl, R., & Van Acker, R. (2000). Heterogeneity of popular boys: Antisocial and prosocial configurations. *Developmental Psychology*, 36, 14-24.

Sage, G.H. (1973). The coach as management: Organizational leadership in American sport. *Quest*, 19, 35-40.

Schall, M., Kemeny, A., & Maltzman, I. (1992). Factors associated with alcohol use in university students. *Journal of Studies on Alcohol*, 53, 122-136.

Schulenberg, J., Bachman, J.G., O'Malley, P.M., & Johnston, L.D. (1994). High school educational success and subsequent substance use: A panel analysis following adolescents into young adulthood. *Journal of Health and Social Behavior*, 35, 45-62.

Schulenberg, J., & Maggs, J.L. (2002). A developmental perspective on alcohol use and heavy drinking during adolescence and the transition to young adulthood. *Journal of Studies on Alcohol Supplement*, 14, 54-70.

Schulenberg, J., Maggs, J.L, Long, S.W., Sher, K.J., Gotham, H.J., Baer, J.S., et al. (2001). The problem of college drinking: Insights from a developmental perspective. *Alcoholism: Clinical and Experimental Research*, 25(3), 473-304.

Shore, E.R., Rivers, P.C., & Berman, J.J. (1983). Resistance by college students to peer pressure to drink. *Journal of Studies on Alcohol*, 44, 352-361.

Selby, R., Weinstein, H.M., & Bird, T.S. (1990). The health of university athletes: attitudes, behaviors, and stressors. *Journal of American College Health*, 39, 11-18.

Shults, R.A., Elder, R.W., Sleet, D.A., Nichols, J.L., Alao, M.O., Carande-Kulis, V.G. et al. (2001). Reviews of evidence regarding interventions to reduce alcohol-impaired driving. *American Journal of Preventative Medicine,* 21(4), 66-88.

Stainback, R.D. (1997). *Alcohol and Sport.* Champaign, IL: Human Kinetics Publishers.

Straus, R., & Bacon, S.D. (1953). *Drinking in College.* New Haven: Yale University Press.

Strauss, R.H. (1991). *Sports Medicine.* Philadelphia: W.B. Saunders Co.

Strauss, V. (2001). College towns, school officials seek end to post-game rioting: String of disturbances part of growing trend, observers say. *Washington Post*, April 4.

Substance Abuse and Mental Health Services Administration. (2001). Preventing problems related to alcohol availability: Environmental approaches prevention enhancement protocols system (PEPS) Series, No. 3, DHHS Publication No. (SMA) 99-3298, Bethesda, MD: Center for Substance Abuse Prevention, Department of Health and Human Services, (available at: http://www.health.org/govpubs/PHD822/aar.aspx).

Thibault, G., Lambert, J., Rivard, M., Brodeur, J.M., & St. Jacques, B. (1984). Utilization of erogenic aids and the attitude toward safety in marathon runners. In F.L. Katch (Ed.), *Sport, Health, and Nutrition: The 1984 Olympic Scientific Congress Proceedings* (Vol. 2, pp. 205-211), Champaign, IL: Human Kinetics.

Thombs, D.L. (2000). A test of the perceived norms model to explain drinking patterns among university student athletes. *Journal of American college Health*, 49(2), 75-83.

Toomey, T.L., & Wagenaar, A.C. (2002). Environmental policies to reduce college drinking: Options and research findings. *Journal of Studies on Alcohol*, Supplement No. 14, 193-205.

Toohey, J.V. (1978). Nonmedical drug use among intercollegiate athletes at five American universities. *Bulletin of Narcotics,* 30(3), 61-64.

Toohey, J.V., & Corder, B.W. (1981). Intercollegiate sports participation and nonmedical drug use. *Bulletin of Narcotics,* 33 (3), 23-27.

Top TV Sports Advertisers. *Sports Inc.*, February 29, 1988.

Tricker, R., & Cook, D. (1989). The current status of drug intervention and prevention in college athletic programs, *Journal of Alcohol and Drug Education*, 34(2), 38-45.

Tricker, R., Cook, D.L., & McGuire, R. (1989). Issues related to drug abuse in college athletics: Athletes at risk. *Sport Psychologist*, 3, 155-165.

Turrisi, R. (1999). Cognitive and attitudinal factors in the analysis of alternatives to binge drinking. *Journal of Applied Social Psychology*, 29, 1512-1535.

United States Department of Health and Human Services (DHHS) (1991). *Adolescent transitions: Alcohol and other drug use prevention (*ADAM91-1725). Washington, DC: Steinberg, L.

United States Department of Health and Human Services (DHHS) (2002). *The NHSDA report: Team sports participation and substance use among youths* (SMASHA Publication). Research Triangle Park, NC: Author.

Upcraft, M.L. (2000). Today's first-year students and alcohol. Paper prepared for the Task Force on College Drinking, National Advisory Council on Alcohol Abuse and Alcoholism, Bethesda, MD.

Urberg, K.A., Degirmenciouglu, S.M., and Pilgrim, C. (1997). Close friend and group influence on adolescent cigarette smoking and alcohol use. *Developmental Psychology,* 33, 834-844.

Wadler, G.I., & Hainline, B. (1989). *Drugs and the Athlete.* Philadelphia: FA Davis Co.

Watson, J.C. (2002). Assessing the potential for alcohol-related issues among college student-athletes. *Athletic Insight: The Online Journal of Sport Psychology*, 4(3). 1-14, http://www.athleticinsight.com/vol4Iss3/alcoholassessment.htm.

Wechsler, H. (2003). Watering down the drinks: The moderating effect of college demographics on alcohol use of high-risk groups. *American Journal of Public Health*, 93, 1929-1933.

Wechsler, H., & Austin, S.B. (1998). Binge drinking: The five/four measure. *Journal of Student Alcohol*, 59, 122-123.

Wechsler, H., Davenport, A.E., Dowdall, G.W., Grossman, S., & Zanakos, S. (1997). Binge drinking, tobacco, and illicit drug use and involvement in college athletics: A survey of students at 140 American colleges. *Journal of American College Health,* 45, 195-200.

Wechsler, H., Davenport, A.E., & Dowdall, G.W., Moeykens, B., & Castillo, S. (1994). Health and behavioral consequences of binge drinking in college: A national survey of students and 140 campuses. *Journal of American Medical Association*, 272, 1672-1677.

Wechsler, H., Dowdall, G.W., Davenport, A., & Castillo, S. (1995a). Correlates of college student binge drinking. *American Journal of Public Health*, 85982-985.

Wechsler, H., Dowdall, G.W., Davenport, A., & Rimm, E.B., (1995b). A gender-specific measure of binge drinking among college students. *American Journal of Public Health*, 85, 982-985.

Wechsler, H., Dowdall, G.W., Maenner, G., Gledhill-Hoyt, J., & Lee, H. (1998). Changes in binge drinking and related problem among American college students between 1993-1997: Results of the Harvard School of Public Health College Alcohol Study. *Journal of American College Health,* 47(9), 57-68.

Wechsler, H., Lee, J.E., Kuo, M., & Lee, H. (2000). College binge drinking in the 1990's: A continuing problem. *Journal of American College Health*, 48, 199-211.

Wechsler, H., Lee, J.E., Kuo, M., & Lee, H. (2002). Trends in college binge drinking during a period of increased prevention efforts: Finding from four Harvard School of Public Health study surveys, 1993-2001. *Journal of American College Health,* 50(5), 203-217.

Werch, C.E., Pappas, D.M., Carlson, J.M., DiClemente, C.C., Chally, P.S., & Sinder, J.A. (2000). Results of a social norm intervention to prevent binge drinking among first-year residential college students. *Journal of American College Health,* 49, 85-92.

Werner, M.J., & Greene, J.W. (1992). Problem drinking among college freshmen. *Journal of Adolescent Health,* 13, 487-492.

Werner, M.J., Walker, L.S., & Greene, J.W. (1996). Concurrent and prospective screening for problem drinking among college students. *Journal of Adolescent Health*, 18, 276-285.

West, J.W. (1997). *The Betty Ford Center Book of Answers*. New York: Pocket Books.

White, A.M., Jamieson-Drake, D.W., & Schwartzwelder, D.H. (2002). Prevalence and correlates of alcohol-induced blackouts among college students: Results of an email survey. *Journal of American College Health,* 51(3), 117-130.

White, H.R., Bates, M.E., & Johnson, V. (1991). Learning to drink: Familial, peer, and media influences. In D.J. Pittman, & H.R. White (Eds.), *Society, culture, and drinking re-examined.* New Brunswick: Alcohol Research Documentation.

Winnail, S.D., Valois, R.F., McKeown, R.E., Saunders, R.P., & Pate, R.R. (1995). Relationship between physical activity level cigarette, smokeless tobacco, and marijuana use among public high school adolescents. *Journal of School Health*, 65, 438-432.

Wood, M.D., Nagoshi, C.T., & Dennis, D.A. (1992). Alcohol norms and expectations as predictors of alcohol use and problems in a college student sample. *American Journal of Drug and Alcohol Abuse*, 18, 461-476.

Yesavage, J.A., & Leirer, V.O. (1986). Hangover effects on aircraft pilots 14 hours after alcohol ingestion: A preliminary report. *American Journal of Psychiatry*, 143, 1546-1550.

Ziemelis, A., Bucknam, R.B., & Elessi, A.M. (2002). Prevention efforts underlying decreases in binge drinking at institutions of higher education. *Journal of American College Health*, 50(5), 238-252.