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The Risk Factors of Alcohol Abuse Among College Athletes

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THE RISK FACTORS OF ALCOHOL ABUSE AMONG COLLEGE ATHLETES

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ABSTRACT

Self-concept theory was used as a theoretical basis to investigate the utility of social norms alcohol prevention programs designed for college athletes. The predictive relationship among alcohol use and athletic identity, competitiveness, drinking game participation, and level of sport participation was investigated. It was discovered that drinking game participation is a significant predictor of total weekly alcohol use above and beyond the other predictors. In addition, drinking game participation and organized recreational sport participation were significant predictors of total binge drinking episodes. While controlling for drinking game participation and competitiveness, no significant differences were found in the amount of alcohol consumed by the participants in different levels of sport participation (intramural, intercollegiate, organized recreational, other sport). It was demonstrated that individuals not currently participating in sports with an athletic identity in the same range as current athletes consumed alcohol at similar rates to current athletes, thus supporting athletic identity as an appropriate way of classifying athlete status. These results highlight the importance of drinking game participation in the alcohol use of college athletes and the validity of applying self-concept theory to social norms alcohol prevention programs.

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CHAPTER 1

INTRODUCTION

College students' alcohol consumption has long been an area of concern for universities and public health agencies. Findings from a national study in 2001 indicated that 81% of college students had consumed alcohol in the last year (Wechsler et al., 2002). In addition, more than half of the 81% of college students who consumed alcohol were considered binge drinkers. Wechsler et al. (2002) identified binge drinking as having five or more beers in a row for men and four or more beers in a row for women. Of these binge drinkers, 21.6% were considered occasional binge drinkers or had engaged in binge drinking one or two times in the past two weeks. Another 22.8% of binge drinkers were found to be frequent binge drinkers or had engaged in binge drinking three or more times over the last two weeks. Several other researchers have found similar results (Harford & Muthen, 2001; Standing, 2002; Wechsler, Dowdall, Davenport, & Rimm, 1995).

Within the population of college students, researchers have identified the subpopulation of college athletes as being at an increased risk for heavier alcohol consumption, binge drinking, and drinking-related negative consequences (Anderson, Albrecht, McKeag, Hough, & McGrew, 1991; Hildebrand, Johnson, & Bogle, 2001; Leichliter, Meilman, Presley, & Cashin, 1998; Meilman, Leichliter, & Presley, 1999; Nelson & Wechsler, 2001; Wechsler, Davenport,

Dowdall, & Grossman, 1997; Wilson, Pritchard, & Schaffer, 2004; Yusko, Buckman, White, & Pandina, 2008a). Anderson et al. (1991) found that up to 88% of athletes used alcohol.

Researchers have compared the binge drinking behaviors of athletes and nonathletes and found that athletes consume more alcohol and binge drink significantly more than nonathletes (Leichliter et al., 1998; Nelson & Wechlser, 2001; Wechsler et al., 1997). Brenner and Swanwick (2007) found that 75% of college athletes reported binge drinking in the last two weeks compared to estimates ranging from 36% to 44% of nonathletes. These findings highlight the importance of determining the factors that make college athletes an at-risk population for increased alcohol use and binge drinking.

The problem does not seem to be getting better despite increased recognition and intervention efforts on the part of health professionals. The National Collegiate Athletic Association (NCAA; 2006) analyzed the frequency of alcohol use by college athletes from 1993 to 2005. It was discovered that the number of college athletes who binge drink increased significantly. In addition, 85% of college student-athletes who reported using alcohol in the last year did so an average of two or fewer times per week. These findings indicate that binge drinking is on the rise among intercollegiate athletes and that current prevention efforts are not working. Alcohol use by college athletes needs to be better understood by researchers and health professionals to provide more effective services to college athletes.

Theories of Alcohol Consumption

Social Norms Theory

One of the recurring themes in the literature to explain alcohol consumption by college athletes is the application of social norms theory. Several researchers have demonstrated that

injunctive norms or “perceived norms regarding the acceptability of alcohol use” (Martens, Dams-O’Connor, Duffy-Paiement, & Gibson, 2006, p. 179) are correlated with the frequency of drinking episodes, amount of alcohol consumed, and binge drinking (Martens, Dams-O’Connor, et al., 2006; Nagoshi, 1999; Perkins & Wechsler, 1996; Wood, Nagoshi, & Dennis, 1992). In addition, descriptive norms or “beliefs one has regarding the prevalence of a specific behavior in a particular population, usually one’s peers” (Grossbard et al., 2009, p. 352) are correlated to the person’s own frequency and quantity of drinking (Baer, Stacy, & Larimer, 1991; Clapp & McDonnell, 2000; Larimer, Turner, Mallett, & Geisner, 2004; Lewis & Neighbors, 2004; Yusko, Buckman, White, & Pandina, 2008b).

There have been mixed findings regarding the success of intervention programs based on social norms theory targeted at college students and college athletes. Several researchers have found that social norm intervention programs produce little or no effect on alcohol use (Barnett, Far, Mauss, & Miller, 1996; Larimer & Crouce, 2007; Thombs & Hamilton, 2002; Wechsler et al., 2003; Werch et al., 2000), and college health officials have publicly called for a reassessment of the validity of these programs (Keeling, 2000). Wechsler et al. (2003) administered seven alcohol consumption measures before and after a social norms marketing program was implemented at 37 colleges. No decreases in any of the seven alcohol consumption measures were found after implementation of the program. In fact, increases in measures of monthly alcohol use and total volume of alcohol consumed were observed at the colleges employing the social norms approach, which indicates the possible risks of the social norms approach.

Other researchers have demonstrated that social norm intervention programs have relative efficacy in delaying the onset of alcohol use and reducing existing alcohol abuse in the college student population (Agostinelli, Brown, & Miller, 1995; Glider, Midyett, Mills-Novoa, Johannessen, & Collins, 2001; Haines & Spear, 1996). The mixed effectiveness of social norms-based intervention programs emphasizes the need to expand the current conceptualization of alcohol use by college students. I am proposing the use of self-concept theory to aid in the understanding and advancement of the literature on alcohol use by college students, specifically college athletes.

Self-Concept Theory

Self-concept theory indicates that an individual's self-concept is a dynamic, ever-changing entity that includes self-identities and self-schemas (Markus & Wurf, 1987). The social roles, or group memberships that an individual identifies belonging to, are their self-identities (Fiske, 2004). Self-schemas have traditionally been examined in terms of personality traits that an individual identifies as describing himself or herself. Self-schemas and self-identities are the two main components of self-concept. The working self-concept consists of several identities and schemas that are accessible to a person at any given time. The individual's emotional state and environment determine the activation of the identities and schemas that make up the working self-concept at any given time (Markus & Wurf, 1987). Perceived injunctive and descriptive norms inform the nature of an individual's identities and schemas. Social norm prevention programs focus on changing injunctive and descriptive norms. Because these programs have produced mixed results, the focus of this study is on how self-identities and self-schemas influence the drinking behavior of college athletes. By

focusing on the self-identities and self-schemas of college athletes, health professionals and researchers can build upon the successes of the social norms approach while addressing its limitations.

Proposed Risk Factors for Alcohol Use

Several risk factors for alcohol use in college populations have been identified in previous research. The risk factors of sport participation, athletic identity, and sport type have been studied in athletic populations and are influential in the amount of alcohol consumed by athletes (Grossbard, Geisner, Neighbors, Kilmer, & Larimer, 2007; Grossbard et al., 2009; Hildebrand et al., 2001; Leichliter et al., 1998; NCAA, 2006). However, this research is underdeveloped and I am attempting to clarify the role that sport participation, athletic identity, and sport type play in the alcohol consumption of college athletes. In addition, the two risk factors of competitiveness and drinking game participation are being addressed as possible risk factors for heavy alcohol consumption in college athletes. These factors have been identified as risk factors for the college student population (Johnson & Sheets, 2004; Nagoshi, Wood, Cote, & Abbit, 1994) but have received little or no attention in college athlete populations.

Sport Participation

Sport participation has traditionally been the most frequently used variable in differentiating college students and college athletes. However, many different definitions of sport participation have been used in research. Some researchers have classified college athletes as individuals who participate in intercollegiate athletics, while others have included intramural, recreational, and intercollegiate athletes in the college athlete category (e.g., Grossbard et al., 2007; Ward & Gryczynski, 2007). Researchers have also classified athletes by

levels of involvement in athletics (Leichliter et al., 1998; Wechsler et al., 1997), and even former athletes have been included in research (Hildebrand et al., 2001). As the definition of athlete has changed, so have the findings. For example, Grossbard et al. (2007) found that intramural athletes drank significantly more than nonathletes. In addition, intramural and intercollegiate athletes drank significantly more than nonathletes, but there was no significant difference between intramural and intercollegiate athletes in alcohol consumption.

Leichliter et al. (1998) studied the level of sport involvement (ranging from noninvolvement in sports to intercollegiate team captains) and found that as the level of sport involvement increased, so did binge drinking and alcohol consumption. In other studies, college athletes have been defined as those who participate in intercollegiate sports; these intercollegiate athletes have been found to drink significantly more than nonathletes (Nelson & Wechsler, 2001). All of these studies indicate that athletes drink more than nonathletes. The varied findings of these authors indicate the need to clearly define and measure the level of sport participation when studying alcohol consumption among college athletes. In this dissertation, I categorize sport participation by all individuals participating in intercollegiate (NCAA), intramural (organized by university), and recreational (organized outside or inside of university) sport participation. In addition, athletic identity is measured in order to further distinguish athlete status.

Athletic Identity

Athletic identity “is the degree to which an individual identifies with the athlete role” (Brewer, Van Raalte, & Linder, 1993, p. 237). Athletic identity is not measured by sport participation, but by how much one identifies with the social role of athlete. Measuring athletic

identity allows for the inclusion of all individuals who view themselves in the social role of an athlete. Athletic identity is an important factor to consider when studying alcohol consumption in college athletes because research supports the notion that alcohol consumption in college athletes goes beyond just sport participation. For example, people who consume alcohol are more active than non-drinkers (Kunz, 1997), former athletes drink at similar rates to current intercollegiate athletes (Hildebrand et al., 2001), and the importance of sport to the individual affects the amount one drinks (Wechsler et al., 1997). In addition, Grossbard et al. (2009) found that athletic identity moderated the relationships among gender, perceived norms, drinking, and related consequences among college students who had participated in high school sports but were not currently participating in sports and college students who were currently participating in intercollegiate sports. Specifically, Grossbard et al. found a significant positive association between the perceived athlete norm and weekly drinking for participants with high levels of athletic identity. They also described that for students reporting low levels of athletic identity the perceived athlete norm was negatively associated with weekly drinking. The existing research indicates that athletic identity is an important variable to consider when measuring alcohol consumption among college athletes. Athletic identity is seen as a way to better classify college athletes that avoids the limitations of previous studies that categorize athletes by just sport participation. Athletic identity also fits in well with self-concept theory and the idea that our self-identities influence our behavior.

Sport Type

Another factor that has been shown to be important when measuring the drinking behavior of college athletes is sport type. Sport type refers to the sport that one currently

participates in (basketball, football, soccer, etc.). The sport the individual participates in plays a key role in self-concept, because different sport teams have different social norms, which influence the identity and schema of the group's members (O'Brien & Lyons, 2000).

Differences across sports concerning alcohol use have been documented by the NCAA. The NCAA (2006) conducted a survey from 1993 to 2005 and found significant differences in alcohol consumption across a variety of men's and women's sports. Additional researchers have found similar results (e.g., Brenner & Swanwick, 2007; Martens, Watson, & Beck, 2006; O'Brien & Lyons, 2000). The finding that alcohol consumption varies across sport type emphasizes the need to further investigate the role of sport type in alcohol consumption among college athletes.

Researchers have started to look at the reasons for the differences in alcohol consumption across sport type. Martens, Watson, et al. (2006) found that social (bond with friends) and enhancement (gives you pleasant feeling) drinking motives partially mediated the relationship between sport type and alcohol consumption in college athletes. Specifically, they indicated that a positive relationship existed between social/enhancement motives and binge drinking, average number of drinks per week and number of days drinking in the past 30 days. The findings that social factors play a role in alcohol consumption give relevance to using self-concept theory in further exploring the reasons for the differences in alcohol use across sport teams. The self-schemas of competitiveness and participation in drinking games are being proposed as a way to further explain the differences between sports in alcohol consumption.

Competitiveness and Drinking Game Participation

Competitiveness is a personality trait that is associated with sport participation and a trait that is often facilitated by sport psychologists and coaches to improve the performance of an athlete (Giacobbi, Roper, Whitney, & Butryn, 2002). Several studies have shown that athletes are more competitive than nonathletes (Gill, Dzewaltowski, & Deeter, 1988; Gill, Kelley, Martin, & Caruso, 1991; Wartenberg & McCutcheon, 1998). Competitiveness is also associated with participation in drinking games and binge drinking (Johnson & Sheets, 2004; Zamboanga, Calvert, O’Riordan, & McCollum, 2007). Participation in drinking games is a highly significant predictor of heavy alcohol use over and above other predictors (Nagoshi et al., 1994), and college athletes participate in more drinking games than other college students (Grossbard et al., 2007). Researchers have looked at drinking game participation, athlete status, and alcohol consumption in only one study. Grossbard et al. (2007) found that drinking game participation was a mediator of the relationship between athlete status and measures of alcohol consumption and related consequences. Specifically, when drinking game participation was added to a general linear model, intramural or intercollegiate athlete status was no longer significant for total weekly alcohol consumption, typical blood alcohol concentration (BAC), peak BAC, and alcohol-related consequences. In an effort to extend Grossbard et al.’s findings, a population that includes nonathletes, intramural, intercollegiate, and recreational athletes is being used. In addition, competitiveness, sport type, and athletic identity are being examined to expand on Grossbard et al.’s findings.

Purpose

The purpose of this research was two-fold. The first was to use self-concept theory to advance the knowledge of variables that make college athletes an at-risk population for increased alcohol use and binge drinking. This will allow health professionals to better design and implement alcohol use intervention programs targeted at college athletes. The second was to determine the reasons for the differences between sport types in weekly alcohol consumption and binge drinking. This will enable health professionals to develop more personalized alcohol use intervention programs for subpopulations of college athletes.

To advance the knowledge of variables that make college athletes an at-risk population for increased alcohol use and binge drinking, I offer the following research questions. Do sport participation, athletic identity, competitiveness, and participation in drinking games affect the amount of binge drinking and weekly alcohol consumption of college athletes? In addition, if these variables have an effect on binge drinking and weekly alcohol consumption, is sport participation's effect significant when considering the variables of athletic identity, competitiveness, and participation in drinking games?

To address the first research question, I hypothesized that sport participation, athletic identity, competitiveness, and participation in drinking games would predict the amount of binge drinking by college athletes. Similarly, sport participation, athletic identity, competitiveness, and participation in drinking games would predict the amount of alcohol that college athletes consume on a weekly basis. The final hypothesis to address the first set of research questions was that when predicting weekly alcohol consumption and binge drinking,

sport participation would not be a significant predictor when considering the factors of athletic identity, competitiveness, and drinking game participation.

To attend to the differences across sport types in alcohol consumption the following research question was proposed. Can the differences between sport types in weekly alcohol consumption and binge drinking be explained by competitiveness and drinking game participation? Thus, I hypothesized that there would be a difference in weekly alcohol consumption and binge drinking across sport type. Secondly, competitiveness and drinking game participation would predict the difference across sport types in weekly alcohol consumption and binge drinking.

CHAPTER 2

LITERATURE REVIEW

Alcohol Prevention Programs

There are three basic categories of college alcohol prevention programs, including education/awareness, cognitive/behavioral skills-based, and motivational/feedback-based. Emerging out of these three styles and showing higher rates of success than other programs is the social norms approach, which combines the education/awareness and motivational/feedback approaches (Thombs & Hamilton, 2002). Overall, the research on the effectiveness of the social norms approach shows mixed results. However, recent research is starting to provide clarity to the reasons for mixed findings. For example, several researchers have shown that social norms programs that include reference to general group norms along with specific group norm references are the most effective (Thombs & Hamilton, 2002; Wechsler et al., 2003; Werch et al., 2000). I am clarifying the findings on the effectiveness of the social norms approach by taking a more in-depth look at the existing literature.

Successful Alcohol Prevention Programs

Several researchers have investigated the effectiveness of alcohol use intervention programs among college students. Agostinelli et al. (1995) conducted research on 26 college students who reported heavy drinking. They used the social norms model to design an

intervention and predicted that “feedback of undesirable deviation from normative standards would result in correction of behavior toward perceived norms” (Agostinelli et al., 1995, p. 31). The intervention involved dividing the group of 26 college students in half and giving one group feedback regarding their drinking behavior in comparison to the population norms; the control group received no feedback. When the feedback subjects were compared to the control subjects, the feedback subjects had a greater reduction in weekly alcohol consumption and typical intoxication levels. Agostinelli et al. demonstrated that when there is a discrepancy between alcohol use behavior and the normative standards individuals will adjust their behavior to avoid cognitive dissonance.

Glider et al. (2001) also targeted perceived norms of drinking when developing a binge drinking intervention program for college students. They used the P. I. E. philosophy, which stands for a proactive, inclusive, and empowering message. The proactive aspect of the philosophy is that the message should be focused on the positive. For example, the P. I. E. approach would involve reporting the number of students who do not binge drink instead of the number of students who do binge drink. Inclusive implies that the message should include the intended audience’s immediate peer group. The empowering aspect of the message is intended to create a sense of empowerment in the intended audience. Utilizing the P. I. E. method, Glider et al. advertised the rates of students who were not binge drinking on campus through a variety of media (newspaper, flyers, etc.). The effectiveness of the program was studied over a three-year period. The rate of students who engaged in binge drinking dropped from 43% to 31% over the three-year period. Glider et al. attributed the success of the program to changing the perceived norms about alcohol use on campus. Agostinelli et al. (1995) and Glider et al.

both had findings that support the idea that college students' drinking behaviors are influenced by perceived descriptive norms.

Glider et al. (2001) based their decision to use the P. I. E. approach on the success of Haines and Spear (1996), who compared the P. I. E. approach to a traditional approach that included interventions such as “(a) It’s OK to abstain; (b) It’s OK to drink in moderation; and (c) Heavy drinking/intoxication cause harm to oneself and others” (p. 136). After collecting baseline data Glider et al. administered the traditional approach to alcohol prevention and found that the number of students who perceived binge drinking as the norm and students who self-reported binge drinking did not significantly differ after administering the traditional approach. After implementing the P. I. E. approach there was a significant change in students’ perception of binge drinking as the norm. In addition, it was found that a significantly smaller number of students reported binge drinking after the P. I. E. program was implemented. The results of the Glider et al., Haines and Spear, and Agostinelli et al. (1991) studies indicate that some college students will change their alcohol use behavior to fit the perceived norm and avoid cognitive dissonance. These findings also demonstrate the relative efficacy of social norms interventions.

Unsuccessful Alcohol Prevention Programs

Research on the use of the social norms approach has had varied results. Wechsler et al. (2003) conducted a large national study on social norms approaches. They administered seven standard survey measures before and after a social norms marketing program was implemented at 37 colleges. All students included in the study were measured on whether or not they had participated in any alcohol use in the past year and month, binge drinking in the past two weeks, and the number of drinks consumed in the past month. The students who had a drink in

the past month were also asked about drinking on more than 10 occasions in the past month, experiencing drunkenness three or more times in the past month, and the usual number of drinks on a drinking occasion. No decreases in any of the seven alcohol consumption measures were found. Interestingly, increases in measures of monthly alcohol use and in drinking 20 or more drinks in the past month were observed at the colleges employing the social norms approach. Wechsler et al. raised concerns about the effectiveness of the social norms program, suggesting that the social norms approach's message about college student drinking patterns is too broad and does not influence individuals to compare themselves to the norm. Individual student drinking patterns have been shown to align more with the drinking behavior of the immediate social group than with the overall college student population (Martens, Dams-O'Connor, et al., 2006; Turrisi, Mastroleo, Mallet, Larimer, & Kilmer, 2007). Thus, Wechsler et al.'s findings support the development of a heavy alcohol use intervention program personalized for college athletes.

Thombs and Hamilton (2002) looked specifically at Division I college student-athletes, employing a campus-wide media campaign designed after the P. I. E. approach and studying the campaign's effect on college student-athletes. The drinking behavior of the college student-athletes was then compared to college student-athletes at two other universities. They found that the social norm campaign did alter some of the perceptions of campus drinking norms, in particular the perceptions of the typical college student and the typical student-athlete. However, there was no evidence to indicate that the campaign reduced alcohol use. Thombs and Hamilton explained the results by pointing out that the perceptions of close friend alcohol use and personal drinking behavior were not affected by the social norms campaign. These

findings support statements by Wechsler et al. (2003) that in order to affect the drinking behavior of college athletes the program needs to be as specific and applicable to the individual and the immediate peer group as possible.

Werch et al. (2000) support the findings of Wechsler et al. (2003) and Thombs and Hamilton (2002). Werch et al. investigated the effectiveness of a social norms intervention program compared to a psychoeducational group and a control group and found no significant differences on alcohol use and alcohol use risk measures between the groups. They examined students at different levels of drinking behavior and found different results for the social norms intervention program. Some positive effects were noted for students who were regular binge drinkers while students in the stage of non-regular binge drinking were negatively affected. Werch et al. suggested that for alcohol use interventions to be effective they must be designed to meet the individual needs of the college student's immediate peer group.

Larimer and Cronce (2007) conducted a literature review on the effectiveness of college drinking prevention strategies. They found the social norms programs to be among the most effective programs when compared to other common approaches aimed at reducing heavy alcohol use. However, there were mixed results for the social norms programs. They recognized that the most effective social norms programs incorporated personalized normative feedback comparison (average alcohol use of an identified subpopulation of the student body and the student body as a whole) as a singular intervention or encouraged individuals to compare personal drinking to the norms. The findings in the literature they reviewed support the idea that the most effective social norms programs have been those that utilize personalized feedback based on the immediate social group with which the individual identifies.

Barnett et al. (1996) compared four groups of college students on four different treatment modalities. The treatments included a social norms treatment program, a values approach, a social norms and values approach, and a control group. They found that the social norms program provided the most changes in the perception of drinking behavior, but no changes in the amount of personal alcohol use were found between the groups. Further findings indicated that for actual drinking behavior to change, it was not enough for perceptions about the student body alone to change or for perceptions about closest friends alone to change. In order for drinking behavior to change, the perceptions of both the student body and closest friends had to change. In addition, for individuals to change their drinking behavior, it was not enough for injunctive norms to change, but it was also necessary for the descriptive norms to change. Barnett et al.'s findings support the use of self-concept theory in developing intervention programs because injunctive and descriptive norms inform the self-identities and self-schemas of an individual. If both sets of norms have to change for behavior to change, then a self-identity or self-schema must change. Thus, identifying and changing the self-schema or self-identity would be an effective way to change the drinking behavior of college students.

In 2000, Keeling discussed the increased use of social norms approaches in the prevention of heavy alcohol use by college students. He pointed out that there is evidence to suggest the relative effectiveness of the social norms approach (Agostinelli et al., 1995; Glider et al., 2001; Haines & Spear, 1996) and there is evidence for concern about the potential harm of this approach (Wechsler et al., 2003; Werch et al., 2000). Keeling suggested "subjecting both the conceptual basis and the application of social norms approaches to objective, evidence

based evaluation” (p. 54). This dissertation is an attempt to build upon the successes of the social norms approach, while addressing the limitations of the approach. I am subjecting the conceptual basis of social norms theory to objective, evidence-based evaluation by using self-concept theory to focus on the self-identities and self-schemas that influence the drinking behavior of college athletes.

Self-Concept Theory

Self-concept is not considered by social psychologists to be a single unit, but a set of semi-attached ideas (Fiske, 2004). Fiske (2004) described the self as “a coral reef: a complex, well-adapted system with many parts and many interrelated functions, no clear boundaries, but lots of psychic flora and fauna coexisting in a complex ecosystem” (p. 178). Research and theory have generally supported the view that self-concept is multidimensional (Gergen, 1971; Harter, 1990; Markus & Wurf, 1987; Marsh & Shavelson, 1985). One aspect of the multidimensional self-concept is the self-schema or cognitive structure. Self-schemas have been traditionally examined in terms of personality traits (Fiske, 2004). Personality traits that people rate themselves high on are considered to be a large part of their self-schemas. These personality traits serve as a framework or guide for organizing information about a person and his or her environment.

A second component of self-concept is self-identity. The groups that a person identifies being a member of are self-identities. Identities are more socially created and focus more on roles than self-schemas (Fiske, 2004). Some of the more common roles that are recognized in American culture are racial, political, and religious roles. People view themselves as having many identities or roles that can change over time and according to their environment (Fiske,

2004). Self-identities and self-schemas are considered separate but interrelated entities that coexist to create an understanding of the self or self-concept (Markus & Wurf, 1987). The combination of self-schemas and self-identities form self-concept, and self-concept is considered to have considerable influence over a person's behavior (Fiske, 2004; Rosenberg, 1979).

Markus and Wurf (1987) used the term “working self-concept” to describe a set of ideas that is readily accessible at any given time. In other words, not all self-identities and self-schemas are available at all times; those that are available are determined by the individual's emotional state and environment. This allows the self-concept to be both stable and changing. Markus and Wurf suggested that core aspects of individuals are the self-identities and self-schemas on which they rate themselves highly. These high-rated self-identities and self-schemas are relatively stable across environments, whereas the identities and schemas that individuals rate themselves moderate to low on vary more across environments. The activation of identities and schemas can be automatic depending on the environment, or the individual can recruit an identity as a way to meet a goal. A common goal mentioned by Rogers (1961) is to maintain self-consistency or a sense of coherence within the self. When an individual's behavior does not match his or her self-concept, it creates cognitive dissonance or feelings of discomfort and the individual will attempt to return to a comfortable way of being. To return to a comfortable state of being, individuals could change their way of thinking about the situation or themselves or change their behavior to fit their self-concept (Rogers, 1961).

Just as self-schemas and self-identities form the self-concept, perceived injunctive and descriptive social norms inform the nature of an individual's identities and schemas.

Descriptive social norms are the “beliefs one has regarding the prevalence of a specific behavior in a particular population, usually one’s peers” (Grossbard et al., 2009, p. 352). In this case, injunctive social norms are “perceived norms regarding the acceptability of alcohol use” (Martens, Dams-O’Connor, et al., 2006, p. 179). Previous research has established a connection among injunctive and descriptive norms and alcohol consumption (Baer et al., 1991; Larimer et al., 2004; Lewis & Neighbors, 2004; Nagoshi, 1999; Perkins & Weschler, 1996; Wood et al., 1992). In an attempt to expand on findings in the current literature, I am focusing on how self-identities and self-schemas are related to weekly alcohol consumption and binge drinking. Since self-identities and self-schemas are informed by injunctive and descriptive norms and also inform self-concept, which influences behavior, identifying the self-identities and self-schemas related to alcohol use adds to the literature on alcohol use in college athletes.

Risk Factors

Sport Participation and Drinking Behaviors

Research has consistently identified college athletes as being an at-risk population for binge drinking, greater weekly alcohol consumption, and higher rates of negative consequences related to alcohol (Hildebrand et al., 2001; Leichter et al., 1998; Meilman et al., 1999; Nelson & Wechsler, 2001; Wechsler et al., 1997; Wilson et al., 2004; Yuskoski et al., 2008a, 2008b). The most prevalent way of looking at the connection between sport participation and drinking behaviors among college athletes is the application of social norms theory. To develop a new perspective on alcohol use by college athletes I am reviewing the previous findings of existing research through the lens of self-concept theory.

Yusko et al. (2008a) compared the prevalence and pattern of alcohol use in nonathletes and undergraduate intercollegiate athletes. Male athletes identified a significantly higher average number of heavy drinking episodes over the past year when compared to other male students. Male athletes reported drinking significantly more on their heaviest day of drinking in the last year than nonathletes. In addition, male athletes reported having significantly more drinks per day on Saturday, whereas nonathletes reported significantly more drinks per day on Thursday, Friday, and Sunday. These findings indicate that athletes do a large amount of their drinking on one day and that when they have the opportunity to drink they maximize it by binge drinking. Yusko et al.'s findings indicate that participation in sport and having the self-identity of a college athlete creates a difference in the amount of alcohol and number of days that college athletes drink.

Meilman et al. (1999) conducted the largest study on alcohol use among intercollegiate athletes and classified over 45,000 participants at over 100 institutions into four categories: Greek athletes, Greek nonathletes, non-Greek athletes, and non-Greek nonathletes. Overall, the results were that students in the Greek athlete group consumed the most alcohol, binge drank more, and had more alcohol-related negative consequences (alcohol related arrests, risky sexual behavior, etc.) than any other group. Greek nonathletes, non-Greek athletes, and non-Greek nonathletes were second, third, and fourth respectively. Meilman et al.'s findings support the findings of Yusko et al. (2008a) and establish that self-identity plays a significant role in the alcohol use of college athletes and college students.

Wilson et al. (2004) further supported the idea that social factors have an effect on the drinking behavior of college athletes by investigating the motives for drinking among college

athletes and nonathletes. They found that male athletes were most likely to drink to get high and for social reasons (bond with friends) of all groups of students, while female athletes and nonathletes of both sexes were more likely to drink for coping reasons. Overall, the findings were that athletes drank more frequently, consumed more alcohol, and were more likely to drink for social reasons than nonathletes. Wilson et al.'s findings indicate that there are some self-schema differences in why college athletes are drinking alcohol and why college students are consuming alcohol.

NCAA (2006) findings support Wilson et al.'s (2004) findings. The NCAA looked at reasons why intercollegiate athletes were drinking. In a sample of over 15,000 intercollegiate athletes, 82.6% reported drinking for recreational (for fun) and social reasons (as a way to bond and socialize with friends), while the second most reported reason was that it makes them feel good (13.6%). These results indicate that the vast majority of intercollegiate athletes of both sexes are consuming alcohol for social reasons. If interventions are going to be successful, they need to address the specific self-schemas related to the social reasons that college athletes have for consuming alcohol.

Yusko et al. (2008b) also compared the motives of athletes and nonathletes for drinking. They measured sensation-seeking personality through a self-report measure that established sensation-seeking as a personality trait and self-schema related to drinking. They found that, compared to nonathletes, athletes reported lower sensation-seeking, enhancement, and coping motives for drinking. Despite reporting lower levels of sensation-seeking motives for drinking, when athletes had sensation-seeking motives for drinking they tended to drink more than nonathletes who were drinking for sensation-seeking motives. Yusko et al.'s findings indicate

that the same self-schema can have a different effect on the drinking behavior of college athletes compared to other college students. This finding further supports the differences between the drinking habits of college athletes and other college students and the need to develop interventions that are specifically designed for college athletes.

Other social factors have been noted to play a role in the drinking behavior of athletes. Nelson and Wechsler (2000) discovered that college athletes are more likely to exhibit social personality characteristics that are associated with binge drinking for college students. College athletes were more likely to have five or more close friends, consider parties as important, spend two or more hours per day socializing, and to report that most of their friends were binge drinkers than nonathletes. These findings indicate that athletes are more socially connected than their nonathlete peers. These same sociability factors predispose them to binge drinking. In addition, the college athletes in Nelson and Wechsler's study were "more likely to say they usually binged when they drank, [and] more likely to be drunk three or more times in the past 30 days" (p. 44). Nelson and Wechsler's findings indicate a clear difference between athletes' and nonathletes' binge drinking behavior and that the self-schemas and self-identity associated with being a college athlete are different from those of a nonathlete college student. In addition, the self-schemas and self-identity associated with a college athlete have many of the same qualities as those associated with a binge drinker.

Turrisi et al. (2007) investigated several social mediator variables of binge drinking in college athletes. Overall, they found that athletes get drunk significantly more often, engage in more episodes of heavy drinking, and drink more on their peak drinking occasion than nonathletes. As for mediator variables, descriptive and injunctive norms had the greatest

amount of significant mediating effects on alcohol use in athletes, but not for nonathletes.

Turrisi et al. believed that a possible source of the differences between athletes and nonathletes “could be attributed to athletes’ perceptions that their peers tended to drink often and heavily and also to the perception that their peers would approve of them in a similar manner” (p. 458).

Martens, Dams-O’Connor, et al. (2006) provide more information as to the possible reasons that descriptive and injunctive norms were mediators of alcohol use by athletes by differentiating athlete and student norms. They were able to demonstrate that “athlete norms demonstrated a stronger relationship with personal alcohol use than normative perceptions of one’s closest friend who was not an athlete” (p. 173). Martens, Dams-O’Connor, et al. suggested that fellow athletes have a stronger influence on the drinking behavior of college athletes than nonathletes. Thus, fellow athletes and the norms of the sport environment play a large role in the development of the self-schema of an athlete and in turn have a significant role in the drinking behavior of college athletes. Martens, Dams-O’Connor, et al.’s findings also emphasize the need to target all college athletes because they have an increased amount of influence on each other.

Self-concept theory seems to fit in well with the existing research. Several studies support the validity of using self-concept theory by demonstrating that different aspects of the self-schemas and self-identities that make up an individual’s self-concept affect drinking behavior (Martens, Dams-O’Connor, et al., 2006; Meilman et al., 1999; NCAA, 2006; Nelson & Wechsler, 2001; Turrisi et al., 2007; Wilson et al., 2004; Yusko et al., 2008a, 2008b). Self-concept theory and research support that studying college athletes separately is important because there are fundamental differences in the self-schemas and self-identity associated with

college athletes and why they are consuming alcohol compared with why other college students are consuming alcohol (Martens, Dams-O'Connor, et al., 2006; Nelson & Wechsler, 2001; Turrisi et al., 2007; Wilson et al., 2004; Yusko et al., 2008b).

Different Levels of Sport Participation

Several researchers have attempted to further explain the role of sport participation in the drinking behavior of college athletes by expanding the concept of sport participation to include not only intercollegiate athletes, but also intramural, recreational, and former athletes. Ward and Gryczynski (2007) investigated alcohol use and recreational sport participation among university undergraduates, defining recreational sport as including intramural/club sports and recreational sporting tournaments/events outside or within the university. Ward and Gryczynski found that recreational sport participation was predictive of “alcohol consumption on the basis of the typical number of drinks consumed on a day of drinking and the number of drinks consumed per week” (p. 276) when several other variables were controlled for, including gender, race, and Greek membership. These findings indicate that it is necessary to include other types of athletes other than intercollegiate athletes when studying alcohol use in college students.

Kunz (1997) took a different approach to classifying her participants when measuring the association between alcohol use and participation in sports. She studied 39,305 participants in the Ontario Health survey age 20 to 65+ and classified them in categories based on an index of monthly frequency of exercise, energy expenditure, and physical activity. She found that “although drinkers are more active than non-drinkers partly due to their age, sex and marital status, alcohol has an independent effect on sports participation” (Kunz, 1997, p. 447). Another

finding was a curvilinear relationship between frequency of drinking and sports. Kunz indicated that “individuals who drink on a daily basis and those who drink less than once a month are less active than those who drink several times a week” (p. 447). Kunz’s findings suggest that there are factors involved in the association between sport involvement and alcohol use that go beyond sport participation. Kunz’s findings also fit well with college athletes who are physically active and binge drink. One explanation that Kunz presented is that there are possible personality traits, such as sensation seeking and extroversion, that affect the association between sport involvement and alcohol use.

Hildebrand et al. (2001) divided participants into three groups: college athletes, high school athletes or people currently in college and not playing sports at the college level, and nonathletes or people who have never played a sport. Both athlete groups drank more frequently than the non-athlete group. Furthermore, 39.6% of college athletes and 35.9% of high school athletes reported drinking more than twice a week, while only 21.2% of nonathletes reported doing the same. They also found that the two athlete groups (former and current) binge drank more than the nonathlete group; 65.8% of college athletes and 62.4% of high school athletes averaged more than three beers each time they drank compared to 44.4% of nonathletes. Hildebrand et al. demonstrated that former and current athletes have similar rates of binge drinking, frequency of drinking, and amount of alcohol consumed. In addition, athletes and former athletes consume larger amounts of alcohol, binge drink more often, and have more drinking episodes than nonathletes. These findings support the idea that the category of current sport participation alone does not adequately provide the needed framework

to effectively research the alcohol use of college athletes, because former athletes are drinking at rates similar to current college athletes.

Leichliter et al. (1998) divided the participants of their study into three different levels of involvement in athletics: noninvolvement in intercollegiate sports, actively involved (member of team but not a leader), and team leaders. They discovered that binge drinking and number of alcoholic beverages consumed in a week increased as the level of involvement in athletics increased. The findings indicate that team leaders, especially males, demonstrate heavier alcohol use and substance use-related problems than other team members and noninvolved participants. Leichliter et al.'s findings indicate that alcohol consumption varies at different levels of participation in sport. It could be that the more an individual is involved in athletics the more he or she identifies with the athlete role (athletic identity) and the more he or she drinks. Leichliter et al.'s findings support the need to measure more than just sport participation when looking at the alcohol consumption of college athletes, particularly the measurement of athletic identity.

Wechsler et al. (1997) also classified athletes by level of involvement in athletics. The three groups were labeled involved, partly involved, and not involved. The involved group was students who spent one or more hours per day in intercollegiate sports and thought participation in athletics was important. Partly involved students spent one or more hours per day in intercollegiate sports or thought participation in athletics was important. Students who spent no time in athletics and did not see athletic participation as important were classified as not involved. For men who were actively involved in athletics, 61% engaged in binge drinking; 55% of those partly involved and 43% not involved were binge drinkers. For women, 50% of

those actively involved in athletics engaged in binge drinking compared to 36% of those not involved. Overall, for college men and women there is a greater percentage of binge drinkers who are somehow involved in college athletics than not involved. In addition, within the population of college athletes individuals are consuming alcohol at different rates. Wechsler et al.'s findings further support the findings of Leichliter et al. (1998) and Hildebrand et al. (2001) in that just measuring sport participation is not an adequate way to measure or explain the drinking behavior of college athletes because the amount of alcohol consumed significantly varies within the population of college athletes. Wechsler et al. further supported the measurement of athletic identity by demonstrating that the perceived importance of sport, which is a concept related to athletic identity, has an effect on the drinking behavior of college athletes.

Grossbard et al. (2007) compared intramural athletes, intercollegiate athletes, and nonathletes on their drinking behavior in two studies. In the first study, they found that intramural athletes scored significantly higher than nonathletes on measures of weekly alcohol consumption (7.18 vs. 4.35), typical and peak blood alcohol concentration (BAC) levels (.05 vs. .04), drinking game participation (3.33 vs. 2.04), and negative consequences (7.75 vs. 5.87). The first study by Grossbard et al. clearly indicated differences in drinking behavior between nonathletes and intramural athletes. In the second step of the study, Grossbard et al. found that intercollegiate and intramural athletes reported greater levels of alcohol consumption, drinking game participation, and related consequences than nonathletes. In addition, "intramural and intercollegiate athletes did not differ significantly on measures of consumption and consequences" (Grossbard et al., 2007, p. 103). Female intramural athletes consumed

significantly more alcohol than female nonathletes, and no significant differences for athlete status were present for women when intercollegiate athletes were added. These findings support the idea that the inclusion of intramural athletes is important when measuring the alcohol use of college athletes.

However, there were several limitations in Grossbard et al.'s (2007) study. The first was that athletes were classified in the two categories of intramural and intercollegiate. The athlete classification left out people who participate in recreational athletics outside of the university even though these people have been shown to be an at-risk population (Ward & Gryczynski, 2007). In addition, people who consider themselves athletes but are not currently participating in sports were not included in Grossbard et al.'s sample, despite being shown to be another at-risk population for increased alcohol consumption (Hildebrand et al., 2001).

The existing research on alcohol use among college athletes is inconsistent in its classification of what a college athlete is. In the research as a whole, intramural (Grossbard et al., 2007), intercollegiate (Grossbard et al., 2007), recreational (Ward & Gryczynski, 2007), and former athletes (Hildebrand et al., 2001) are at risk for increased alcohol consumption. In addition, college athletes at different levels of participation in sports and those ranking sports at different levels of importance have different rates of drinking (Lechlitter et al., 1998; Wechsler et al., 1997). In order to address the shortcomings and advance the sport participation and alcohol use research, for the purpose of this dissertation, "sport participation" included all individuals who have participated in intramural, intercollegiate, and recreational sports within or outside of the university in the last 12 months. Furthermore, in order to consider the importance of sport and include former athletes, athletic identity was measured.

Athletic Identity as a Risk Factor for Alcohol Use

Athletic identity is a concept that has received research and theoretical attention in the field of sport and exercise psychology (Brewer, Selby, Linder, & Petitpas, 1999; Brewer et al., 1993; Grossbard et. al., 2009; Harter, 1990; Sadalla, Linder, & Jenkins, 1988). “Athletic identity is the degree to which an individual identifies with the athlete role” (Brewer et al., 1993, p. 237). Athletic identity was used in the present study because research supports that when studying alcohol consumption, the construct “college athlete” comprises a broader group than those just currently participating in sports. People who drink are more active than non-drinkers (Kunz, 1997), former athletes drink at similar rates to current intercollegiate athletes (Hildebrand et al., 2001), and the importance of sport to the individual affects the amount one drinks (Wechsler et al., 1997). Athletic identity is a way to better classify college athletes that avoids the limitations of previous studies that categorize athletes by sport participation alone. Measuring athletic identity allows for the inclusion of all individuals who view themselves in the social role of an athlete, which is congruent with self-concept theory and the idea that our self-identities influence our behavior.

When people rank athletic identity of high importance in their lives, athletic identity is viewed as having a major influence on a person’s self-concept and behavior (Brewer et al., 1993). In addition, Harter (1990) found that despite the constantly changing nature of the identities that comprise self-concept, athletic and physical domains of self-evaluation have been found to be prevalent across the lifespan. Athletic identity has been found to be associated with a number of factors related to the treatment of college athletes. Athletic identity is associated with sport participation burnout (Gould, Tuffey, Udry, & Loehr, 1996; Gould & Udry, 1996;

Raedeke, 1997), adjustment to sport career termination (Grove, Lavalley, & Gordon, 1997), career maturity (Murphy, Petitpas, & Brewer, 1996), alcohol consumption (Grossbard et al., 2009), alcohol-related consequences (Grossbard et al., 2009), the use of dangerous performance-enhancing strategies (Hale & Waalkes, 1994), and adjustment to injury (Brewer, 1990). Particular interest has been shown to people who score high on athletic identity, but findings have been inconsistent. High levels of athletic identity are associated with an increased risk of encountering mood disturbance after injury (Brewer et al., 1993), possessing low career maturity (Murphy et al., 1996), binge drinking (Grossbard et al., 2009), and anabolic steroid use (Hale & Waalkes, 1994). However, high athletic identity has also been shown to be a protective factor against drinking-related consequences for male athletes (Grossbard et al., 2009). In addition, Settles, Sellers, and Damas (2002) found that there was a positive relationship between high athletic identity and well-being. The inconsistencies in the existing research on athletic identity highlight the importance of developing a better understanding of how athletic identity affects the overall self-concept and behavior of individuals, especially college athletes and their alcohol use behavior.

Recent research involving athletic identity has focused on examining the relationships among athletic identity and college student and college athlete descriptive norms on drinking and drinking-related consequences among incoming freshmen at two universities (Grossbard et al., 2009). Grossbard et al. (2009) included all individuals who reported participating in varsity sports in high school. In this sample, only 15% reported being current intercollegiate athletes. Grossbard et al. found that gender and athletic identity moderated the association between weekly drinking and alcohol-related consequences. The three-way interaction between gender,

athletic identity, and weekly drinking indicated that stronger athletic identity was a protective factor for negative consequences among males reporting greater weekly drinking, but this was not true for females. These findings contradict the majority of research indicating that male athletes generally experience more drinking-related consequences than females and nonathletes (Hildebrand et al., 2001; Lechlitter et al., 1998; Wilson et al., 2004; Yusko et al., 2008a). The biggest difference between the Lechlitter et al. (1998), Yuskos et al. (2008a), Hildebrand et al. (2001), and Wilson et al. (2004) studies and Grossbard et al. is that Grossbard et al. classified participants by athletic identity. The contrast in the findings highlights the importance of distinguishing between sport participation and athletic identity when studying alcohol consumption and related consequences.

Grossbard et al. (2009) also found that athletic identity moderates the association between descriptive norms and drinking among high school athletes matriculating to college. People reporting high athletic identity had a stronger positive relationship between perceptions of college athlete weekly drinking and individual weekly alcohol consumption. This finding supports self-concept theory and that an individual's behavior is increasingly affected by a self-identity as the identification with the identity strengthens (Brewer et al., 1993).

A limitation of the Grossbard et al. (2009) research was that they only examined incoming freshmen, making the findings only generalizable to incoming freshmen. By including a more diverse population of college students who have already matriculated to the college environment the findings are more generalizable to college students of all levels. In addition, Grossbard et al. did not include current sport participation in the analysis, though this has been shown to play a large role in the drinking behavior of a college athlete (Anderson et

al., 1991; Hildebrand et al., 2001; Leichter et al., 1998; Meilman et al., 1999; Nelson & Wechsler, 2001; Wechsler et al., 1997; Wilson et al., 2004; Yusko et al., 2008a). In order to extend Grossbard et al.'s findings, the relationship among athletic identity, current sport participation, and alcohol use among college athletes of all grades needs to be investigated.

Sport Type

Sport type refers to the sport in which one is participating. The sport an individual participates in plays a key role in self-concept because different sport teams have different social norms and these norms influence the self-identity and self-schema of the group's members (O'Brien & Lyons, 2000). According to self-concept theory, an individual strives to maintain self-consistency in order to avoid cognitive dissonance (Rogers, 1961). Athletes spend a considerable amount of time with their teammates (Harvey, 1999) and the influence of sport type on drinking behavior can be strong for college athletes because the self-schemas associated with their sport type are more congruent with their self-concept than the self-schemas associated with the general idea of being a participant in sports.

Several studies have shown that alcohol consumption differs between sport types. One of the largest studies on alcohol use by college athletes was a 12-year survey among 19,676 Division I, II, and III intercollegiate student athletes conducted by the NCAA (2006). The NCAA broke down the statistics by sport type, gender, and type of drug. Differences were found across sport type for men and women's sports. The most recent survey was conducted in 2005 and the following results were found for alcohol use in men's sports: 94.9% of lacrosse, 94% of ice hockey, 86.8% of water polo, 82.3% of golf, 82.1% of baseball, 80.8% of swimming, 80.2% of wrestling, 79.8% of soccer, 75.2% of football, 72.5% of tennis, 68.2% of

track and field, and 63.4% of basketball players reported drinking alcohol (NCAA, 2006). For women's sports it was found that 93.3% of lacrosse, 92.9% of ice hockey, 88.8% of field hockey, 87.5% of gymnastics, 83.4% of soccer, 83.3% of swimming, 80.9% of softball, 79.1% of volleyball, 75.1% of golf, 73.1% of tennis, 67.4% of basketball, and 64.6% of track and field athletes used alcohol (NCAA, 2006). These findings demonstrate a clear difference in alcohol consumption among sport types even when gender is controlled for, thus supporting self-concept theory and the effect of sport type on the drinking behavior of college athletes.

Other researchers have found results similar to the NCAA (2006) study. Martens, Watson, et al. (2006) looked at 340 intercollegiate student athletes from two NCAA Division I universities. Swimming/diving athletes reported "more heavy episodic drinking than athletes from all other sports, averaged more drinks per week than athletes from track/cross country, and reported more days drinking in the past 30 days than athletes from the sports of soccer and track/cross country" (Martens, Watson, et al., 2006, p. 142). When the researchers looked directly at binge drinking they found that 65% of swimmers/divers, 50% of baseball/softball players, 33% of soccer players, 32% of basketball/volleyball players, and 28% of track/cross country athletes were binge drinkers. In addition, Martens, Watson, et al. found that social and enhancement motives partially mediated the relationship between sport type and measures of alcohol consumption. Martens, Watson, et al.'s findings support that there are differences between sport types in alcohol use. The findings also indicate that athletes are drinking for social reasons. Since teammates spend a significant amount of time together in and outside of sport (Harvey, 1999), the self-schemas and self-identity associated with the specific team the athlete is on play a large role in the drinking behavior of college athletes.

Martin (1998) looked at the differences in alcohol consumption among women's intercollegiate sport teams and found significant differences. Overall, 79% of female student athletes consumed alcohol; 60% engaged in binge drinking out of season and 35% in season. More softball (89%) and volleyball (88.9%) athletes consumed alcohol than did basketball (63.2%) athletes. Martin found that female student athletes drank mainly for social reasons, thus supporting the findings of the Martens, Watson, et al. (2006) study and the idea that the self-schemas and self-identity associated with the specific team play a large role in the drinking behavior of college athletes.

Brenner and Swanwik (2007) conducted a survey of 720 athletes from team and individual sports across Division I, II, and III of the NCAA. Significantly more team sport athletes reported binge drinking (84%) than individual sport athletes (57%). In addition, 44% of athletes of both sexes reported binge drinking on three or more occasions in the past two weeks and 62% reported having seven or more drinks in the past month. When the statistics were broken down by sport, the men's lacrosse teams (90%) had the highest rate of drinking followed by baseball (87%) and women's lacrosse (86%). Furthermore, 46% of the participants in the individual sport of women's track and field reported binge drinking and 64% of the men's track and field athletes reported binge drinking.

Zamboanga, Rodriguez, and Horton (2008) expanded on Martin's (1998) and Brenner and Swanwik's (2007) findings. Zamboanga et al. found differences between women's teams concerning binge drinking and drinking game participation. The teams that reported binge drinking had upwards of 85% and 90% of individuals reporting that they participated in drinking games with teammates. Zamboanga et al. also found that a higher frequency of team

social events was associated with a greater likelihood of binge drinking and drinking game participation. These findings support the idea that if binge drinking and drinking game participation are a part of the self-schema and self-identity of being a member of a team, then college athletes will consume alcohol and participate in drinking games in order to maintain self-consistency and avoid cognitive dissonance.

O'Brien and Lyons (2000) provide an international perspective on athlete alcohol consumption. They found similar differences in alcohol consumption across college and professional athletes from different sports in Ireland, with 89% of cricket, 88% of rugby, 84% of hurling, 77% of Gaelic football, 70% of US football, and 68% of basketball players drinking alcohol, while only 48% of rowing, 40% of tennis, 25% of cycling, and 20% of horse racing athletes drank alcohol. O'Brien and Lyons demonstrated that sport type differences in alcohol consumption exist not only in America and in collegiate athletes but in professional athletes and across cultures.

Research has consistently shown that college athlete drinking behavior differs across sport type (Brenner & Swanwik, 2007; Martens, Watson, et al., 2006; Martin, 1998; NCAA, 2006; O'Brien & Lyons, 2000; Zamboanga et al., 2008). It has also been supported that the self-schemas related to each sport type are a significant reason for these differences (Brenner & Swanwik, 2007; Martens, Watson, et al., 2006; Martin, 1998; Zamboanga et al., 2008). Zamboanga et al. (2008) identified that drinking games might play a role in why there are differences across sport types. I am proposing that the self-schema of competitiveness and drinking game participation can help explain why there are differences across sport type in alcohol consumption.

Competitiveness and Drinking Game Participation

Competitiveness and sport participation. Competitiveness is a personality trait that is associated with sport participation and often facilitated by sport psychologists and coaches to improve the performance of an athlete (Giacobbi et al., 2002). Giacobbi et al. (2002) conducted a qualitative study with 10 NCAA Division I coaches (five men's and five women's coaches). The interviews were semi-structured and focused on having the coaches discuss their experiences with athletes who had made considerable progress while on their teams. One of the themes that emerged was competitiveness/motivation: "All of the coaches described successful athletes as being motivated and competitive" (Giacobbi et al., p. 170). In addition, coaches viewed a competitive and supportive team environment as being important in the skill development process of an athlete. Each coach used regular interventions with the team to facilitate this type of environment. Giacobbi et al. established that athletes come from an environment that values competitiveness and is designed to facilitate competitiveness.

Research has shown that when compared to nonathletes, athletes are more competitive (Gill et al., 1991, Gill et al., 1988; Wartenberg & McCutcheon, 1998). Wartenberg and McCutcheon (1998) compared members of a minor league hockey team with a group of fans on a measure of competitiveness and found that athletes scored significantly higher than fans on the measure of competitiveness. Similarly, Gill et al. (1988) found that competitiveness was the strongest discriminator between sport and nonsport participants when measuring achievement orientation in a population of high school students. Wartenberg and McCutcheon and Gill et al. support the notion that athletes are more likely to have competitiveness as a part of their self-schema than nonathletes.

Gill et al. (1991) compared college athletes and nonathletes on several motivational orientation measures designed specifically to measure competitive orientation. They discovered that men scored higher than women on competitiveness, which is consistent with the fact that men consume more alcohol than women. Furthermore, intercollegiate college athletes scored higher on competitiveness than nonathletes, which is consistent with the fact that college athletes consume more alcohol than nonathletes. These findings indicate some possible parallels between alcohol consumption and competitiveness.

Competitiveness and alcohol consumption. Serrao, Martens, Martin, and Rocha (2008) examined the relationship between competitiveness and alcohol use in recreational and elite college athletes and nonathletes. They found that competitiveness is related to alcohol use among athletes and nonathletes. For athletes, competitiveness has a positive correlation with peak and heavy episodic drinking, with the most competitive athletes drinking the most in one episode of drinking. Since athletes are more likely to be competitive, these findings indicate that competitiveness could put athletes at risk for heavy alcohol use. Serrao et al. have been the only researchers to discover these findings, and future research should attempt to confirm them.

Competitiveness and drinking game participation. One explanation for why competitiveness puts college athletes at a higher risk for heavy alcohol consumption could be drinking game participation. Competitiveness is a trait that has been associated with participation in drinking games by college students and college student athletes (Johnson & Sheets, 2004; Zamboanga et al., 2007). Johnson and Sheets (2004) looked at the motivation of male and female college students for playing drinking games and found that playing for competition and thrills was the number one reported reason for participating in drinking games.

They discovered that this motivation was associated with excessive alcohol consumption and excessive consumption consequences. Individuals who played drinking games for competitive reasons drank more alcohol than individuals participating for other reasons. In summary, the self-schema of competitiveness puts college students at risk for participating in drinking games and drinking more alcohol when participating in drinking games.

Newman, Crawford, and Nellis (1991) interviewed college student drinking game participants about their reasons for participating in drinking games. During the interviews they received several responses related to competitiveness. One participant reported that

This is a good way for macho men to prove how much they can drink. I myself have stepped up and challenged people to play quarters when I knew I could drink them under the table. . . . I have been in many competitive drinking games where people would never think of dropping out until they are drunk. There is also a lot of peer pressure to play these games and stay in them as long as you can. (Newman et al., 1991, p. 173)

Responses such as this indicate that competitiveness is a factor in determining drinking game participation and the amount of alcohol one drinks during the drinking game.

Zamboanga et al. (2007) studied female college athletes and their drinking game participation. They found that more female college athletes (73%) participated in drinking games that were perceived as the most competitive such as ping pong and speed, suggesting that the competitive nature of the games is what attracted the female athletes to the games. For the more competitive games the motive of competition and thrills was positively associated with levels of intoxication, so the female athletes were more likely to drink larger quantities in

the more competitive games. Zamboanga et al. support Johnson and Sheets (2004) and Newman et al. (1991) by further developing the concept that competitiveness puts college athletes at risk for increased participation in drinking games and higher levels of alcohol consumption and intoxication when participating in drinking games. In summary, research indicates that college athletes are at a higher risk for participating in drinking games and for heavy alcohol consumption when participating in drinking games because they are more likely to be competitive (Gill et al., 1988, 1991; Wartenberg & McCutcheon, 1998) and they are immersed in an environment that fosters competitiveness (Giacobbi et al., 2002).

Drinking game participation and alcohol consumption. Drinking game participation has been found to be associated with an increase in alcohol consumption (Pederson & LaBrie, 2006). Pederson and LaBrie (2006) had 105 college students participate in a three-month timeline follow-up recording every drinking event and how much they drank. In addition, they identified the days that they participated in drinking games and how much they consumed when participating in drinking games. When drinking, men reported binge drinking 94% of the time when engaging in drinking games compared to 61% of the time while not participating in drinking games. Women reported binge drinking 87% of the time when participating in drinking games and 59% of the time during non-drinking game drinking periods. College men and women consume more drinks when participating in drinking games as compared to non-drinking game drinking events.

Nagoshi et al. (1994) found that drinking game participation was a highly significant predictor of heavy alcohol use over and above other predictors:

Drinking games accounted for a substantial amount of additional explained variance in frequency of getting drunk over and above the effects of other variables, that is, much of the relationship between drinking game playing and heavy alcohol use was not mediated by personality or cognitions about alcohol use and effects. (p. 210)

The existence of a relationship between drinking games and binge drinking emphasizes the importance of gaining an increased understanding of why individuals participate in drinking games.

Pederson (1990) discussed possible reasons for participation in drinking games and established that drinking game participation is a cross-cultural phenomenon. He found that 70% of 17 to 19 year old Norwegian youth who consumed alcohol participated in drinking games. In addition, the frequency of participation in drinking games was indicative of overall alcohol consumption even after controlling for parental and peer drinking. It was found that individuals who drink and participate in drinking games consume significantly more alcohol than individuals who drink and do not participate in drinking games. Pederson suggested that drinking and taking part in drinking games is positively reinforcing for individuals because it provides a social context that facilitates social interaction by providing rules for communication, cooperation between team members, a safe framework for socializing, and an increased possibility of developing community spirit and establishing friendships.

Johnson, Hamilton, and Sheets (1999) found that college students' reasons for playing drinking games added significantly to general reasons for drinking in predicting the quantity of alcohol consumed and the number of binge drinking days per week. Johnson et al. also found that "students appear to play drinking games primarily to obtain positive reinforcement and

positive reinforcement reasons for play seem most predictive of consumption” (p. 286). Thus, Johnson et al.’s and Pederson’s (1990) findings indicate that positively reinforcing motives are the strongest predictors for drinking game participation. These findings support self-concept theory and indicate that participating in drinking games is positively reinforcing because the college student is able to maintain self-consistency and avoid cognitive dissonance if participation in the drinking game is a part of the individual’s self-schema or self-identity.

Newman et al. (1991) took a qualitative approach to studying the amount of alcohol consumed while playing drinking games. They observed students at parties and found that drinking game participants consumed, on average, 18 ounces of beer in a 15-minute period, whereas individuals not participating in drinking games consumed 4-6 ounces of beer in a 15-minute period. Newman et al. also interviewed students about their reasons for participating in drinking games and found that 64% reported playing drinking games to socialize. One participant said, “People participate in drinking games because they are a way to fit in” (Newman et al., 1991, p. 173). These findings further support the assumption that college students are participating in drinking games as a way to avoid cognitive dissonance. The findings of Johnson et al. (1999), Newman et al., Nagoshi et al. (2004), Pederson (1990), and Pederson and La Brie (2006) indicate that college students consume more alcohol when participating in drinking games and that college students are participating in drinking games for positive reinforcement reasons and as a way to avoid cognitive dissonance. This supports self-concept theory and indicates the relevance of determining if college athletes are participating in drinking games for the same reasons.

Athletes and drinking game participation. Grossbard et al. (2007) are the only researchers to look at drinking game participation, alcohol consumption, and negative alcohol-related consequences among college athletes. They found that both intramural and intercollegiate athletes reported greater alcohol consumption, drinking game participation, and negative alcohol-related consequences than nonathletes. “When adding drinking game participation as a predictor, in addition to athlete status and gender, athlete status was no longer significant for any consumption measures, including total weekly consumption, typical blood alcohol content (BAC) and peak BAC” (Grossbard et al., 2007, p. 102). The findings of Grossbard et al. indicate that drinking game participation is a factor that has predictive power for alcohol consumption in a population of college athletes. When drinking game participation is combined with other variables, drinking game participation exceeds the power of athlete status as a predictor for alcohol use by college athletes. More research is needed to confirm the findings of Grossbard et al. because it is the only study to measure the relationships among drinking game participation, alcohol consumption, and negative alcohol-related consequences for college athletes.

There were some limitations in the Grossbard et al. (2007) study. The first was that competitiveness was not measured despite the fact that it is related to drinking game participation and the amount of alcohol consumption (Johnson & Sheets, 2004; Zamboanga et al., 2007). In order to confirm and extend the findings of Grossbard et al., I investigated the relationship between drinking game participation, competitiveness, and alcohol consumption among college athletes.

Summary

Competitiveness is related to peak and heavy episodic drinking (Serrao et al., 2008) and to drinking game participation (Johnson & Sheets, 2004; Zamboanga et al., 2007), which leads to higher rates of binge drinking (Nagoshi et al., 1994; Newman et al., 1991; Pederson, 1990; Pederson & LaBrie, 2006). This puts athletes at an increased risk of binge drinking because they are more competitive than nonathletes (Gill et al., 1991, 1988; Wartenberg & McCutcheon, 1998) and come from an environment that values and fosters competitiveness (Giacobbi et al., 2002). Researchers have started to investigate this issue and college athletes have been shown to participate in more drinking games than nonathletes, and drinking game participation is a significant predictor of alcohol consumption for college athletes (Grossbard et al., 2007). However, more research is needed to confirm the Grossbard et al. (2007) findings, and no researchers until now have looked at the relationship among competitiveness, drinking game participation, and alcohol consumption in college athletes.

CHAPTER 3

METHODS

Design

This research uses a quantitative descriptive research design. It is an ex post facto design, because the variables being measured already exist and are not being manipulated by the researcher in any way. This dissertation is designed to measure the relationships among sport type, sport participation, athletic identity, competitiveness, weekly alcohol consumption, and number of binge drinking episodes in college athletes. Questionnaires that measure each variable were administered over the internet.

Participants and Sampling

Purposeful sampling of college athletes of both genders from two Division I universities in the Midwest was conducted. To recruit participants, an announcement was sent out over the campus connect system at one of the universities requesting voluntary participation. In addition, to help increase participation by college athletes, flyers were distributed throughout the athletic department and related athletic buildings of both universities.

A total of 207 college students participated in the research. Of the 207 college students, 51 identified as male (24.63%) and 156 female (75.36%). Ages ranged from 18 to 57 ($M = 24.22$, $SD = 7.18$). The participants were mainly Caucasian ($n = 160$; 77.29%) and African

American ($n = 32$; 15.45%), while eight individuals identified being Asian (3.86%), five as “other” (2.41%), and two as Hispanic (.96%). In addition, 33 individuals reported being a member of a fraternity or sorority (15.94%) and 174 (84.05%) reported no involvement in Greek organizations. The participants were asked about sport involvement and 30 responded as being organized recreational athletes (14.49%), 28 as intramural athletes (13.52%), 23 had other sport involvement (11.11%), 14 were intercollegiate athletes (6.76%), and 112 reported no involvement in sports (54.1%).

Instrumentation

Athletic Identity

Athletic identity was measured through the use of the Athletic Identity Measurement Scale (AIMS). The AIMS was developed by Brewer et al. (1993) and uses a 7-item Likert scale ranging from strongly disagree to strongly agree. Items include “I consider myself an athlete” and “Most of my friends are athletes.” Brewer et al. reported test-retest reliability scores of $r = .89$ over a two week period and internal consistency alphas at .81 to .93. Since Brewer et al.’s initial validation of the scale many other studies have demonstrated its psychometric properties (Brewer & Cornelius, 2001; Martin, Eklund, & Mushett, 1997; Visek, Hurst, Maxwell, & Watson, 2008). Brewer and Cornelius (2001) investigated the norms and factorial invariance of the AIMS. They found that the mean score for college athletes was 38.21 with a standard deviation of 6.54. The 7-item AIMS was also reported as internally consistent (Cronbach’s $\alpha = .81$). The higher order factor structure found the AIMS to be applicable to both men and women and to athletes and nonathletes.

Vissek et al. (2008) cross culturally validated the use of the AIMS. They looked at both American and English-speaking Hong Kong Chinese populations. Internal consistency was reported at .81 for the Hong Kong sample. Vissek et al. also found that the “results of the confirmatory factor analyses of the multi-dimensional factorial structure of the 7-item AIMS indicated an adequate fit for both American and Hong Kong samples” (p. 478).

Total Weekly Alcohol Consumption and Number of Binge Drinking Episodes

To measure alcohol use and binge drinking the Daily Drinking Questionnaire (DDQ) was used. The DDQ was developed by Collins, Parks, and Marlatt (1985). The DDQ assesses alcohol consumption over each day of the week of a typical week in the past month. It provides the standard definition of alcohol intake for the respondent (12 oz. beer, 4 oz. wine, 1 oz. liquor, etc.). It includes a separate column for each day of the week in which the respondent is to fill in the average number of alcoholic drinks they have typically consumed on that day. Corbin, Morean, and Benedict (2008) found an internal reliability of .79 for the days of the week questions. The total weekly alcohol consumption score is the sum of the number of drinks for each day of the week. The number of binge drinking episodes is the number of days per week that men consumed five or more alcoholic beverages and women consumed four or more alcoholic beverages.

Drinking Game Participation

The DDQ was also modified to measure drinking game participation. Drinking game participation was measured by having the participants identify what days of the week they have participated in drinking games. This was added to the already existing question that has the respondents identify the number of drinks they consume each day of the week. The question

“Did you participate in any drinking games on this day? Yes or No” was added to each column for each day.

Competitiveness

Competitiveness was measured by the competitiveness subscale of the Sport Orientation Questionnaire (SOQ) (Gill & Deeter, 1998). The complete SOQ is a 25 item measure utilizing a Likert scale with responses ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). The SOQ measures three achievement orientations: competitiveness, win, and goal. To measure competitiveness, the 13-item competitiveness subscale was used. It includes items such as “I am a competitive person” and “I thrive on competition.” Gill and Deeter (1998) developed the scale and reported good internal consistency scores of .95 to .94 and acceptable test-retest reliability of .89. In addition, they were able to demonstrate construct validity by finding that the competitiveness score consistently “differentiated students in competitive classes from students in noncompetitive classes and competitive sport participants from noncompetitive sport participants” (Gill & Deeter, 1998, p. 200).

Wartenberg and McCutcheon (1998) were able to provide further support for the scale’s solid psychometric properties. They compared professional hockey players to sport fans using the SOQ. The professional hockey players had significantly higher scores on all three subscales of the SOQ when compared to fans. The alpha coefficient for the competitiveness subscale was .96. Other studies have found similar results with college students and college athletes (Gill et al., 1988, 1991).

Gill et al. (1988) demonstrated the convergent and divergent validity of the SOQ in a population of high school and university students. It was found that the SOQ was highly

correlated with other competitiveness measures and uncorrelated with competitive anxiety and social desirability. In addition, “competitiveness scores were the strongest discriminators between competitive sport participants and non-participants” (Gill et al., 1988, p. 139). Gill et al. (1991) also found that athletes scored higher than nonathletes on all three SOQ orientation scores.

Sport Type and Participation

Sport participation and sport type was measured by one question. Participants were asked to “Please circle any of the following activities that you have participated in during the past 12 months: (1) Intercollegiate sports, If yes; What intercollegiate sport have you participated in the last 12 months? (ex: baseball, football, track & field, softball, soccer, etc.); (2) Intramural sports; (3) Organized recreational sports on campus; (4) Organized recreational sports off campus (running, YMCA); (5) Other sports, If yes, please list; (6) No involvement in any type of sport.”

Demographics

A modified version of the General Information Questionnaire that accompanies the DDQ was used to gather information on gender, age, ethnicity, fraternity or sorority status, and university attended. Gender, ethnicity, fraternity or sorority status, and university attended are displayed in a multiple choice format. Age was asked as a fill in the blank question.

Procedures

A survey was developed online through the use of Qualtrics. Participants were recruited through a campus connect announcement and flyers at both universities, requesting voluntary participation. The announcement and flyers encouraged participants to visit a website where

participation in a 20-30 minute anonymous survey was conducted. Informed consent was assumed upon the participant going to the website and completing the surveys. After completion of the surveys, the participant's commitment was over. For the first four hypotheses, I stratified participants by sport participation and athletic identity score. For the last four hypotheses, the participants were grouped according to level of sport participation. After 207 participants had completed the survey (necessary to meet power levels) the website was closed and data collection ended.

To test the first four hypotheses only the participants who scored 31.67 or higher on the AIMS or reported participating in intercollegiate, intramural, organized recreational, and other sports within the last 12 months were included in the regression analyses. The AIMS score of 31.67 was used because it is one standard deviation below the athlete norm (Brewer & Cornelius, 2001). In order to obtain a power of .80 and a high effect size of .80 at an alpha level of .05, at least 65 participants were needed for multiple regression. This resulted in a total of 100 athletes including 30 organized recreational, 28 intramural, 23 other sport involvement, 14 intercollegiate athletes, and five participants who reported no sport involvement but had an AIMS of 31.67 or higher. The average AIMS score for the subsample of 100 athletes was 28.43 with a standard deviation of 10.56. The average SOQ score was 50.85 and a standard deviation of 11.00. The average number of drinks per week was 3.89 with a standard deviation of 6.90. The average age of the participants was 23.44 ($SD = 6.52$) and the median age was 22. There were more female participants ($n = 68$) than male ($n = 32$). There were 75 Caucasian, 15 African American, five "other," four Asian, and one Hispanic participant. A total of 19 participants reported being a member of a fraternity or sorority.

For the last four hypotheses only the participants who report intercollegiate athletic participation were planned on being included. To obtain a power of .76 with an effect size of .75 at an alpha level of .05, at least 40 participants for each of the five levels of sport type were needed for an ANCOVA. The five sport types that were targeted were football, baseball, track and field, soccer, and softball. However, acquiring the required number of intercollegiate athlete participants was not accomplished. Thus, in order to obtain desired power and effect size levels the groups of athletes being compared changed from different intercollegiate sport teams to different levels of sport participation. The necessary power level of .80 was obtained by including, organized recreational sport ($n = 30$), intramural ($n = 28$), other sport participation ($n = 23$), and intercollegiate ($n = 14$) athletes for a total of 95 athletes. For the population of athletes that was used in the last four hypotheses the average SOQ score was 51.21 with a standard deviation of 10.43. The average age of the respondents was 23.30 and a standard deviation of 6.51. There were 72 Caucasian, 13 African American, five other, four Asian, and one Hispanic participant. In addition, there were 65 women and 30 men. There were 19 participants who identified being a member of a fraternity or sorority.

Hypotheses

The following hypotheses were proposed:

1. For college athletes, a significant amount of the variance in number of binge drinking episodes will be accounted for by sport participation, athletic identity, competitiveness, and participation in drinking games.

2. After adding athletic identity, competitiveness, and drinking game participation to the prediction equation, sport participation will no longer account for a significant amount of variance in number of binge drinking episodes.
3. For college athletes, a significant amount of the variance in total weekly alcohol consumption will be accounted for by sport participation, athletic identity, competitiveness, and participation in drinking games.
4. After adding athletic identity, competitiveness, and drinking game participation to the prediction equation, sport participation will no longer account for a significant amount of variance in total weekly alcohol consumption.
5. There will be significant differences across levels of sport participation in total weekly alcohol consumption.
6. A significant portion of the variance across levels of sport participation in weekly alcohol consumption will be accounted for by the variables of competitiveness and drinking game participation.
7. There will be significant differences across levels of sport participation in number of binge drinking episodes.
8. A significant portion of the variance across levels of sport participation in number of binge drinking episodes will be accounted for by the variables of competitiveness and drinking game participation.

Operational Definition of Variables

Athletic identity: “the degree to which an individual identifies with the athlete role” (Brewer et al., 1993, p. 237), as measured by a cumulative score on the Athletic Identity Measurement Scale.

Drinking game participation: the reported engagement in any drinking game during a typical week in the last month by the participant.

Sport type: the sport an intercollegiate athlete identifies as participating in during the last 12 months (Martens, Watson, et al., 2006).

Sport participation: whether or not an individual identifies as participating in a recreational sport outside or inside of the university, intramural sport, intercollegiate sport within the last 12 months, or scoring 31.67 or higher on the AIMS.

Competitiveness: striving to increase or maintain one’s level of capability in all activities in which a standard of excellence is thought to exist and where the execution of such activities can either succeed or fail (Fabian & Ross, 1984), as measured by a cumulative score on the Sport Orientation Questionnaire.

Weekly alcohol consumption: the total amount of alcoholic beverages consumed during a typical week in the last month.

Number of binge drinking episodes: number of times in a typical week in the last month that the individual consumed five or more alcohol drinks in one setting for men and four or more alcohol drinks in one setting for women (Yusko et al., 2008).

Level of sport participation: the level of sport participation an individual identifies being a part of, including intercollegiate, intramural, organized recreational, or other sport participation.

CHAPTER 4

RESULTS

Preliminary Analyses

The results were examined for missing data. Through the use of the Statistical Package for the Social Sciences (SPSS) version 16, it was determined that 31 respondents did not complete a significant portion of the survey battery. For example, one respondent did not answer any of the AIMS questions and another failed to answer all but one item on the SOQ. The 31 incomplete survey batteries were excluded leaving 176 participants' responses. In addition, a missing value analysis was conducted to determine if the remaining missing values were missing due to chance, or if there was a pattern. No single respondent was found to account for more than five percent of the missing data, which indicated that the missing values were random. Therefore, the Expected Maximization Method was used to create substitute scores for the various scales used in the final analyses. Outliers were assessed and there were not enough outliers to be significant at the .01 significance level, meaning that outlying data are not significantly affecting the data.

Analyses

In order to test hypotheses one and two, a stepwise and hierarchical multiple regression was used to determine the relationship between the predictor variables of sport participation,

athletic identity, drinking game participation, and competitiveness and the criterion variable of the number of binge drinking episodes. A second stepwise and hierarchical multiple regression was used to test hypotheses three and four and determine the relationship between the predictor variables of sport participation, athletic identity, drinking game participation, and competitiveness and the criterion variable total weekly alcohol consumption. Multiple regression was chosen because it is seen as the best way to determine the relative contribution of each predictor variable on the criterion variables of weekly alcohol consumption and number of binge drinking episodes. For hypotheses two and four, the hierarchical regression allows the researcher to determine if the contribution of sport participation is significant in predicting weekly alcohol consumption and number of binge drinking episodes when considering drinking game participation, athletic identity, and competitiveness.

An additional set of analyses using only athletes was conducted. Two analyses of covariance (ANCOVAs) were used to determine the differences in weekly alcohol consumption and number of binge drinking episodes across levels of sport participation in college athletes. The covariates were competitiveness and drinking game participation. Level of sport participation was the independent variable. Weekly alcohol consumption was the dependent variable for the first ANCOVA and number of binge drinking episodes was the dependent variable for the second ANCOVA. An ANCOVA allows the researcher to remove the impacts of the covariates of competitiveness and drinking game participation to determine the amount of variance in weekly alcohol consumption and number of binge drinking episodes that are due to level of sport participation. When significance was found, Tukey post hoc comparison tests were run to determine particular differences across levels of sport participation.

Hypothesis 1: Prediction of Binge Drinking Episodes by Sport Participation, Athletic Identity, Competitiveness, and Participation in Drinking Games

Assumption Tests

Collinearity analysis revealed that none of the variables' variance inflation factor (VIF) score was over 10 and tolerance scores did not fall below the .20 threshold indicating that there is no concern for multicollinearity (Bowerman & O'Connell, 1990). In addition, variance proportion data indicate large variance proportions on the same small eigenvalues, which is a good indicator of no multicollinearity (Field, 2009). Casewise diagnostics indicate that 10 cases lie outside of the expected plus or minus 2 standard residual. This is five more than the 5% we would typically expect. However, nine of the 10 cases lie within plus or minus 2.5, which does meet the expectation of 99% being within plus or minus 2.5. Thus, we can say it is a fairly accurate model. The histogram of standardized residuals indicates normality. The standardized residual normal P-P plot and scatterplot show the grouped pattern that would be expected with dichotomous predictors.

Regression Analysis

In order to test the first four hypotheses, it was necessary to dummy code the sport participation variable. Intercollegiate athletes were used as the baseline group, because they have been the group of athletes that has received the most attention from researchers. The dummy-coded variables were intramural vs. intercollegiate, organized recreational sports vs. intercollegiate, other sport participation vs. intercollegiate, and no sport participation with an AIMS score of 31.67 or higher vs. intercollegiate. For the stepwise regression analyses (examining hypotheses one and three), the dummy coded variables were included as predictors

in the multiple regression analysis along with drinking game participation, AIMS score, SOQ score, and the dependent variables of total binge drinking episodes in one week and total weekly alcohol consumption.

Analysis of the results of the stepwise multiple regression for hypothesis one revealed that two variables predicted a significant amount of variance of binge drinking episodes (see Table 1). In the first step, drinking game participation entered into the regression equation, explaining 32% of the variance in the sample and 32% of the variance in the general population. This variable was significant, $F(1, 98) = 46.49, p < .01$. Each time a college athlete participates in a drinking game he or she has a 1.21 predicted increase in the number of binge drinking episodes. The effect size for model one was calculated using Cohen's f^2 ($f^2 = .47$) and is considered to be a medium to large effect size (Field, 2009). In the second step, drinking game participation and the dummy coded variable of organized recreational sports entered into the regression equation, explaining 35% of the variance in the sample and 34% of the variance in the general population (see Table 1). The linear combination of these two predictor variables was significant, $F(2, 97) = 26.06, p < .01$. Each time a college athlete participates in a drinking game he or she has a 1.24 predicted increase in binge drinking episodes. There is a .31 predicted increase in the number of binge drinking episodes if the participant is involved in organized recreational sports off or on campus when compared to the other types of sport participation. The effect size for model two was calculated using Cohen's f^2 ($f^2 = .54$) and is considered to be a large effect size (Field, 2009).

Table 1

Stepwise Regression Analysis Summary for Variables Predicting Total Binge Drinking Episodes (N = 100)

Name	<i>B</i>	β	<i>t</i>	<i>p</i>
Step 1				
Drinking game participation	1.21	.57	6.82	.000
Step 2				
Drinking game participation	1.24	.58	7.09	.000
Organized recreational vs. Intercollegiate	.31	.17	2.04	.044

Note. Step 1: $R^2 = .32$; Adjusted $R^2 = .32$. $n = 100$. Step 2: $R^2 = .35$; Adjusted $R^2 = .34$.

Hypothesis 2: Prediction that Sport Participation Will Not Account for a Significant Amount of Variance in Number of Binge Drinking Episodes with the Inclusion of Other Variables

Hypothesis two was that when considering athletic identity, competitiveness, and drinking game participation, sport participation would not account for a significant amount of unique variance in number of binge drinking episodes. To test this hypothesis it was necessary to run a hierarchical regression to further separate the unique contribution of the dummy coded sport participation variables in the predication equation and determine if sport participation was having a significant effect on the total number of binge drinking episodes when considering the other independent variables of drinking game participation, competitiveness, and athletic

identity. The first step of the regression only included the dummy coded sport participation variables and was not significant. The second step included the dummy coded sport participation variables, drinking game participation, competitiveness, and athletic identity. The second step was found to be significant, $F(7, 92) = 7.68, p < .001$. The sport participation dummy coded variables did not significantly contribute to predicting variance in step one or two. In summary, the non-significance of the dummy coded sport participation variables as the sole predictors in step one coupled with the significance of the second step including all variables (with dummy coded sport participation variables not accounting for a significant amount of variance in this second step) confirms hypothesis two. When considering athletic identity, competitiveness, and drinking game participation, sport participation is not a significant predictor of binge drinking episodes.

Hypothesis 3: Prediction of Total Weekly Alcohol Consumption by Sport Participation, Athletic Identity, Competitiveness, and Participation in Drinking Games

Assumption Tests

Collinearity analysis revealed that none of the variables' VIF scores were over 10 and tolerance scores did not fall below the .2 threshold indicating that there is no concern for the violation of multicollinearity (Bowerman & O'Connell, 1990; Menard, 1995). In addition, variance proportion data indicate large variance proportions on the same small eigenvalues, which is a good indicator of no multicollinearity (Field, 2009). Casewise diagnostics indicate that four cases lie outside of the expected plus or minus 2 standard residual. We expect 5%, which is five in a sample of 100, so we can say it is an accurate model. The histogram of

standardized residuals indicates normality. The standardized residual normal P-P plot and scatterplot show the grouped pattern that would be expected with dichotomous predictors.

Regression Analysis

Hypothesis three addressed the drinking patterns of college athletes through the dependent variable of number of alcoholic beverages consumed in one week. Stepwise regression resulted in one step that explained a significant amount of variance, $F(1, 98) = 39.56$, $p < .001$. The one significant predictor was drinking game participation, which explained 29% of the variance in the sample ($n = 100$) and 28% in the general population. The regression coefficient (B) was 9.32 and the standardized regression coefficient (β) was .54. Thus, each time a college athlete participated in a drinking game he or she has a 9.32 predicted increase in the number of alcoholic beverages a week. The effect size for step one was calculated using Cohen's f^2 ($f^2 = .41$) and is considered to be a medium to large effect size (Field, 2009).

Hypothesis 4: Prediction that Sport Participation Will Not Account for a Significant Amount of Variance in Total Weekly Alcohol Consumption with the Inclusion of Other Variables

For hypothesis four, I predicted that when adding athletic identity, competitiveness, and drinking game participation to the prediction equation, sport participation would not account for a significant amount of unique variance in total weekly alcohol consumption. To test this hypothesis, it was necessary to run a hierarchical regression to further separate the unique contributions of the dummy coded sport participation variables in the prediction equation and determine if sport participation was having a significant effect on total weekly alcohol consumption when considering the other independent variables of drinking game participation,

competitiveness, and athletic identity. The first step of the regression included only the dummy coded sport participation variables and was not significant. The second step included the dummy coded sport participation variables, drinking game participation, competitiveness, and athletic identity. The second step was found to be significant, $F(7, 92) = 6.16, p < .001$. The dummy coded sport participation variables did not significantly contribute to predicting variance in steps one or two. In summary, the combination of the non-significance of the first step that included only the dummy coded sport participation variables, and the significance of the second model including all variables (with the dummy coded sport participation variables not accounting for a significant amount of variance) confirms hypothesis four. Sport participation was not a significant predictor of total weekly alcohol consumption when including athletic identity, competitiveness, and drinking game participation.

Hypotheses 5 and 6: Prediction of Significant Differences across Levels of Sport Participation in Total Weekly Alcohol Consumption, with the Significant Variance Accounted for by the Variables of Competitiveness and Drinking Game Participation

Assumption Tests

In the analysis for hypothesis five the assumption of homogeneity of variance was violated as indicated by a p value of .01 in Levene's test of equality of error variances. Field (2009) suggested that Levene's test of equality of error variances is not always the best way to determine whether variances are unequal enough to cause problems and suggested double checking the violation by looking at Hartley's F_{\max} test or the variance ratio. I compared the critical value for Hartley's F_{\max} test and the observed critical value of 7.43 was higher than the critical value. This indicates that the variances may be unequal enough to cause problems in

the data (Field, 2009). This could be partially explained by the differences in group size. Due to the problems caused by unequal variances further interpretation of this data is done with caution.

Analysis of Covariance

In hypothesis five it was stated that there would be significant differences across levels of sport participation in the dependent variable of total weekly alcohol consumption. An ANCOVA was performed to test this hypothesis. Competitiveness and athletic identity were the covariates, while the independent variable was level of sport participation with the four levels of intramural, intercollegiate, organized recreational, and other sport participation. Analysis of the results for hypothesis five indicates that the ANCOVA model was not significant. However, it was discovered that drinking games was a good covariate, because it significantly predicted the dependent variable of number of alcoholic beverages in a week, $F(1, 89) = 1251.27, p < .01$, partial $\eta^2 = .29$. The addition of drinking game participation significantly increased the amount of variance accounted for by the model by 27.2%. However, there were no significant differences across the groups of athletes in amount of alcohol use in a week. In addition, competitiveness was not found to be a significant covariate. Because the results of hypothesis five were non-significant there is no reason to explore hypothesis six.

Hypotheses 7 and 8: Prediction of Significant Differences across Type of Sport in Number of Binge Drinking Episodes, with the Significant Variance Accounted for by the Variables of Competitiveness and Drinking Game Participation

Assumption Tests

Hypotheses seven and eight explored the same concept as five and six but with total number of binge drinking episodes as the dependent variable. The assumption of homogeneity of variance was violated as indicated by a p value of .02 in Levene's test of equality of error variances. To further understand the violation of homogeneity of variance I again looked at Hartley's F_{\max} test or the variance ratio (Field, 2009). The first step was to analyze the highest and lowest variances of the variables. I compared the critical value for Hartley's F_{\max} test and the observed critical value of 2.38 was less than the critical value. This indicates that the data should be robust to violations concerning the differences in variances (Field, 2009).

Analysis of Covariance

Analysis of the results indicates that the ANCOVA model was not significant. However, it was indicated that drinking games was a good covariate, because it significantly predicts the dependent variable of number of binge drinking episodes in a week, $F(1, 89) = 24.01, p < .01$, partial $\eta^2 = .36$. The addition of drinking game participation significantly increased the amount of variance accounted for by 34.89%. However, there were no significant differences across the groups of athletes. In addition, competitiveness was not found to be a significant covariate. Because the results of hypothesis seven were non-significant there is no reason to explore hypothesis eight.

Summary

In summary, the stepwise regression analysis for total binge drinking episodes revealed two steps that predicted a significant amount of variance. The first step included drinking game participation and the second step included drinking game participation and recreational sport participation. The stepwise regression analysis for total weekly alcohol consumption revealed one significant step with drinking game participation as the only significant predictor.

Hypotheses two and four were confirmed by two hierarchical regressions. Two ANCOVAs were used to explore the differences between levels of sport participation in total weekly alcohol consumption and binge drinking episodes, and no significant differences were found. However, drinking game participation was a significant covariate in both ANCOVAs.

CHAPTER 5

DISCUSSION

Self-concept theory was effectively used to advance the knowledge of variables that make college athletes an at-risk population for increased alcohol use and binge drinking. This will allow health professionals to better design and implement alcohol use intervention programs targeted at college athletes. It was hypothesized that increased focus on the self-identities and self-schemas that make up a person's self-concept could build upon the successes of the social norms approach while addressing the limitations. Thus, several independent variables that fit neatly into the framework of self-concept theory and had previous empirical support for having an effect on alcohol use in a college age population were chosen to be further explored.

It was found that drinking game participation plays a vital role in the amount of alcohol college athletes consume and how often they binge drink. Recreational sport participation was shown to have an effect on the amount of binge drinking episodes reported by college athletes. Athletic identity and competitiveness were not found to be directly related to total weekly alcohol consumption or number of binge drinking episodes. When drinking game participation and competitiveness were statistically removed, no differences in alcohol consumption between levels of sport participation were found.

Athletic Identity

The first variable chosen was athletic identity. Athletic identity is a topic that has recently received a lot of attention from researchers. Athletic identity is not measured by sport participation, but by how much one identifies with the social role of athlete. The AIMS was used to measure athletic identity. Athletic identity was included because research supports the notion that alcohol consumption in college athletes goes beyond just sport participation. For example, Grossbard et al. (2009) found that athletic identity moderated the relationships among gender, perceived norms, drinking, and related consequences among college students who had participated in high school sports but were not currently participating in sports and college students who were currently participating in intercollegiate sports. Specifically, Grossbard et al. found a significant positive association between the perceived athlete norm and weekly drinking for participants with high levels of athletic identity. Grossbard et al. indicated that for students reporting low levels of athletic identity the perceived athlete norm was negatively associated with weekly drinking. In addition, other researchers demonstrated that individuals who were not currently participating in sports but perceived sport as important (Wechsler et al., 1997) or had previously played sports (Hildebrand et al., 2001) consumed alcohol at similarly high rates. Athletic identity was considered a better way to classify college athletes that avoided the limitations of previous studies that categorized athletes by just sport participation.

The hypothesis of athletic identity being a better way to classify athletes was somewhat supported by the results of the current study. There were no significant differences in three of the four analyses between the group of participants who were not currently participating in sports and reported high athletic identity (AIMS score of 31.67 or higher), and the other sport

groups. The only difference found was that organized recreational sport participants were significantly different from all other levels of sport participation in binge drinking. These findings lead one to think the difference in binge drinking has more to do with organized recreational sport participants than the other levels of sport participation including those with no sport participation in the last 12 months and high athletic identity. This provides preliminary evidence that if you recognize yourself as having the self-identity of an athlete then your identity as an athlete is just as important, and maybe more important, than actual participation in sport in terms of alcohol consumption. As a result of the small sample size of the no sport participation and high athletic identity group ($n = 5$) and lack of previous empirical support, it is still uncertain whether the subjective identification with the self-identity of athlete is as or more important than actual sport participation. This finding does provide some of the groundwork to build on with future research.

Athletic identity was not found to be a significant predictor of alcohol consumption. One reason for this could be that the athletic identity for participants in this study ($M = 28.4$, $SD = 10.5$) was significantly lower than that reported in previous studies. Brewer and Cornelius (2001) found that the average athletic identity for college athletes was 38.21 with a standard deviation of 6.54. The below average level of athletic identity could demonstrate that the athletes in the current study do not recognize the self-identity of being an athlete as central to their self-concept. Thus, according to self-concept theory athletic identity or any identity that is not viewed as subjectively important has little effect on a person's behavior (Markus & Wurf, 1987).

Considering the results of the current study and Grossbard et al.'s (2009) research it could be that athletic identity may have an indirect effect on alcohol use in athletes by moderating whether or not they follow athlete drinking norms, but it does not seem to have a direct relationship with alcohol consumption. These findings have a lot of practical value when designing alcohol prevention programs for college athletes. Athletes with high athletic identity are influenced by the drinking norms of the athletic culture at the university, so increased focus on shaping the social norms surrounding alcohol use in the athletic community would be key in effectively moderating the drinking behavior of athletes with high athletic identity. In addition, the athletes with low athletic identity would benefit from a different approach since they are not as influenced by the athlete drinking norms. Possibly focusing on the alcohol norms for the self-identities the athlete does subjectively identify as being important would be more effective.

Competitiveness

The personality trait of competitiveness was included in this research for several reasons. The first is because several studies have shown that athletes are more competitive than nonathletes (Gill et al., 1988, 1991; Wartenberg & McCutcheon, 1998). Competitiveness is also associated with participation in drinking games and binge drinking (Johnson & Sheets, 2004; Zamboanga et al., 2007). Participation in drinking games is a highly significant predictor of heavy alcohol use over and above other predictors (Nagoshi et al., 1994), and college athletes participate in more drinking games than other college students (Grossbard et al., 2006). In addition, Serrao et al. (2008) found that competitiveness was directly related to alcohol use in athletes and nonathletes.

It was hypothesized that competitiveness would predict total weekly alcohol use and binge drinking. Competitiveness was not found to be a predictor. Serrao et al.'s (2008) findings were not supported. One reason for this could be that the average age of Serrao et al.'s sample was 20 with a standard deviation of 2.0, which is three years younger than the average age ($M = 23$) of the participants in the current research and the standard deviation ($SD = 6.5$) was larger in the current study. From a developmental point of view, three years can make a big difference in maturity level and alcohol consumption patterns.

Johnson and Sheets (2004) and Zamboanga et al. (2007) demonstrated that competitiveness is a significant motive in college students' decision to participate in drinking games. This study did not directly address competitiveness as a motive for participating in drinking games. The direct relationship between competitiveness and alcohol consumption was investigated and no significant relationship was found in this study. When you combine the previous evidence for competitiveness being a motive when deciding to participate in drinking games (Johnson & Sheets, 2004; Zamboanga et al., 2007) with the current findings of drinking games leading to more binge drinking and alcohol consumption, it remains important to consider the level of competitiveness in college athletes when monitoring alcohol use. The inclusion of competitiveness as a moderator of drinking game participation could be a useful statistical tool in further research. In addition, finding healthy outlets outside of the sports arena for athletes to express their competitiveness could be an effective way to keep athletes from participating in drinking games and cut down on alcohol consumption.

Drinking Game Participation

Drinking game participation was included because it is a variable that has received little research attention. When it has been researched the results have been promising, especially in college athlete populations. For example, participation in drinking games is a highly significant predictor of heavy alcohol use over and above other predictors (Nagoshi et al., 1994), and college athletes participate in more drinking games than other college students (Grossbard et al., 2007). Researchers have looked at drinking game participation, athlete status, and alcohol consumption in only one study. Grossbard et al. (2007) found that drinking game participation was a mediator of the relationship between athlete status and measures of alcohol consumption and related consequences. Specifically, when drinking game participation was added to a general linear model, intramural or intercollegiate athlete status was no longer significant for total weekly alcohol consumption, typical blood alcohol concentration (BAC), peak BAC, and alcohol-related consequences. In an effort to extend Grossbard et al.'s findings a population that included those not currently participating in sports and with high athletic identity, intramural, intercollegiate, and recreational athletes was used. In addition, competitiveness, level of sport participation, and athletic identity were examined to expand on Grossbard et al.'s findings.

In the current study, drinking game participation was a significant predictor of weekly alcohol consumption and binge drinking episodes. Specifically, when college athletes participated in drinking games, they drank nine more alcoholic beverages in a week and had one more binge drinking episode than college athletes who did not participate in drinking games. This increased alcohol use can greatly increase the chances of negative health,

financial, legal, social, and academic consequences for college athletes (Grossbard et al., 2007). In addition, college athletes who participate in drinking games and are actively participating in their sport are likely experiencing performance deficits due to their high levels of alcohol use.

Because drinking game participation had a significant relationship with total weekly alcohol consumption and binge drinking episodes, it could be useful to use drinking game participation as a covariate in future analyses of alcohol consumption patterns. Using drinking game participation as a covariate might allow future researchers to get a clearer look at the variance that other variables could account for in alcohol consumption patterns.

Sport Participation

Sport participation was included in this study because it is the most frequently used way of differentiating college students and college athletes. However, many different definitions of sport participation have been used in research. Part of the purpose of this research was to help clarify the definition of college athlete and further develop a standard of communication when referring to the categorization of college athlete. In this dissertation, I categorized sport participation by all individuals participating in intercollegiate (NCAA), intramural (organized by university), and recreational (organized outside or inside of university) sport participation. In addition, individuals who had not participated in sports in the last 12 months but had a high athletic identity were considered athletes. The inclusion of people with high athletic identity and no sport participation was an attempt to demonstrate the validity of self-concept theory and the belief that the subjective classification of identifying with the self-identity of an athlete is just as or more important in predicting alcohol use than actual participation in sport. As discussed earlier, the results of the statistical analyses support this theory.

In addition, using a broader definition of college athlete and including more types of athletes such as organized recreational athletes resulted in finding that organized recreational athlete status was a significant predictor of binge drinking episodes even with drinking game participation and other variables included. This finding raises the question: Why do organized recreational athletes have a significantly different amount of binge drinking episodes than other athletes, but not a significant difference in total weekly alcohol consumption? It could be that intercollegiate, intramural, other sport participation, and no sport participation with high athletic identity athletes do not consume alcohol or consume alcohol more casually or consume alcohol and do not meet the four or more drinks for women or five or more drinks for men to result in binge drinking, while organized recreational athletes more frequently binge drink when they are consuming alcohol. One explanation for organized recreational athletes' higher rates of binge drinking could be the culture of the organized recreational sports world. Many organized recreational sports located off of university campuses involve the consumption of alcoholic beverages before and after games. Sometimes so-called "beer leagues" are associated with binge drinking. It could be that the organized recreational sport athletes only drink at the organized recreational "beer leagues," which significantly increases the amount of binge drinking episodes without significant increases in total weekly alcohol consumption. In addition, it could be that binge drinkers seek out these leagues because it provides the opportunity to be in an environment where binge drinking is the norm. In summary, organized recreational athletes are at higher risk for binge drinking when compared to other athlete subgroups.

When comparing the results of the current research with previous findings there are many interesting commonalities and differences. For example, Grossbard et al. (2007) found that intramural and intercollegiate athletes consumed alcohol at similar rates. The current research expanded on Grossbard et al.'s work by supporting the finding that intramural and intercollegiate athletes drink at similar rates. In addition, other sport participants and individuals with no sport participation but who identify with the self-identity of an athlete drink at similar rates as intramural and intercollegiate athletes.

Hildebrand et al.'s (2001) findings that former high school athletes now in college but not participating in sports consume alcohol at similar levels to current intercollegiate athletes is congruent with the current finding that athletes identifying with the self-identity of athlete drink at similar rates to intercollegiate athletes. Similar to Hildebrand et al., Wechsler et al.'s (1997) findings that individuals who ranked athletics as important in their life drank at similar rates to intercollegiate athletes is congruent with the current research. Additionally, Ward and Gryczynski (2007) found that recreational athlete status was predictive of the number of alcoholic beverages consumed each day and total weekly alcohol consumption. The current research findings of organized recreational sport status being predictive of alcohol use patterns was congruent with Hildebrand et al., Ward and Gryczynski, and Wechsler et al.'s findings. Ward and Gryczynski found that organized recreational sport status was predictive of total weekly alcohol consumption, whereas in the current research organized recreational sport status was predictive of binge drinking episodes and not total weekly alcohol consumption. One reason for the difference in findings could be the disparity in the definition of organized recreational athletes. Ward and Gryczynski included intramural, club, and recreational sports

outside and inside of the university in their organized recreational sport category whereas, in the current research, intramural sports was in a separate category from organized recreational sports inside or outside of the university. Because organized recreational sport participation has been predictive of alcohol consumption in two studies that have conflicting definitions of recreational athletes, additional research that uses a consistent definition and has a larger sample size is needed to further understand the relationship between organized recreational sport participation and alcohol use.

The findings that sport participation is not a significant predictor by itself or when including athletic identity, drinking game participation, and competitiveness support Grossbard et al.'s (2007) results. Specifically, Grossbard et al.'s finding that once drinking game participation is added to the prediction equation intramural and intercollegiate status are not significant was supported in the current research. In addition, the current findings extend Grossbard et al.'s results by providing empirical data that when considering drinking game participation, competitiveness, and athletic identity sport participation is not significant when predicting total weekly alcohol consumption and binge drinking episodes. These findings further support the observation that participation in sport is not the best predictor of alcohol use.

Limitations

There are several limitations that are inherent in survey research. The first limitation is low internal validity. The alcohol consumption of college athletes is being studied as it occurs naturally. No control variables, no randomization, no control for extraneous variables, and no manipulation of variables are taking place. This results in a high level of external validity and low levels of internal validity. There are limitations to external validity. The sample was

purposefully gathered from NCAA Division I college athletes at two universities in the Midwest region of the United States. A university on the high end of student enrollment and one on the low end of student enrollment for NCAA Division I universities were purposefully sampled to increase the external validity of the results in the context of Division I college athletes. However, involvement from the larger enrollment Division I university was limited, so the results may not be as applicable to athletes at larger universities, in different NCAA divisions, and in different regions of the United States. Thus, results can easily be generalized to smaller division I universities but caution should be taken in generalizing the results to dissimilar universities.

Another limitation is mono-method bias. Data were only being collected through the use of one method and through one viewpoint. The self-report of behaviors have the two main limitations of social desirability and self-awareness. The self-report of the amount of drinks that a person consumes has several limitations. For many college students it is difficult to remember the exact number of alcoholic beverages one consumed in a given night. For example, if a person drinks to the point of blacking out or is drinking mixed drinks that have been made by someone else it would be hard to know the exact amount of alcohol consumed. In addition, when participating in drinking games it is hard to keep track of the amount of alcohol that one drinks, because you could be sharing drinks with others or drinking various amounts of different types of alcohol. In addition, many sports teams have rules against the consumption of alcohol, and respondents could be reluctant to report accurate drinking patterns due to the fear of disciplinary action. Some of the respondents were under the legal drinking age and a fear of legal ramifications could have affected their reports of alcohol consumption.

In general, it is more socially desirable to report alcohol use that the person views as not being excessive than it is to report excessive alcohol use. The use of an anonymous online survey was an attempt to control for these socially desirable responses.

One limitation was the average age of the sample ($M = 23$). The average age of the sample is higher than the average age in the majority of research on college athletes' alcohol use. A possible explanation for this could be that more graduate and/or non-traditional students took the survey, but no clear explanation for this is known. The age difference could have affected the results of the analyses. Significant developmental changes occur in the college years, such as the development of the prefrontal cortex, which is instrumental in impulse control behaviors (Kolb & Whishaw, 2008). A more developed prefrontal cortex could have led to differences in alcohol consumption patterns in the sample of participants used in this research compared to the younger sample used in the majority of other research on alcohol use in college athletes.

Another limitation was the inability to recruit enough intercollegiate athletes in order to analyze differences among sport teams in drinking habits. Research strongly supports differences among intercollegiate sport teams (Brenner & Swanwick, 2007; Martens, Watson, et al., 2006; NCAA, 2006; O'Brien & Lyons, 2000). Any findings about the differences among sport teams in alcohol consumption could have been influential in determining if and how sport teams differ in alcohol use. As a way to still address differences among sport teams the differences between levels of sport participation was measured. Even though no significant differences were found between the levels of sport participation, the analysis led to discovering the usefulness of drinking game participation as a covariate when looking at the differences

between levels of sport participation and measuring the alcohol consumption patterns of college athletes.

Another possible limitation could be that binge drinking episodes were only measured on a weekly basis. It is plausible to think that many binge drinkers do not binge drink every week, but every other week or once every three weeks or more. Thus, when filling out the questionnaire, alcohol use and binge drinking episodes would not have been included in a typical week.

Some limitations can be found in the stepwise method of multiple regression. The most frequently cited critique of stepwise multiple regression is that variables are retained solely by statistical means. This can lead to a contrast between the statistical findings and the conceptual and theoretical implications of the results. In addition, there is also danger for over-fitting or including too many variables in the model that have little contribution to predicting the outcome and under-fitting or not including important predictors in the model (Field, 2009).

One statistical limitation was the violation of homogeneity of variance in the ANCOVA for hypothesis five. A follow up Hartley's F_{\max} test indicated that the variances of the groups are so different that it likely caused problems in the statistical analysis of hypothesis five. However, this violation only occurred in the hypothesis five ANCOVA.

Summary and Future Directions

Overall, the use of self-concept theory has been shown to have utility when working with college student athletes in relation to alcohol use. Whether it is designing or implementing social norms alcohol prevention programs or working with athletes individually, there are several key points that can be taken from this research. The first point to consider is the

concept of athletic identity and its relationship to alcohol use. Considering the results of the current study and Grossbard et al.'s (2009) research, it is important to consider that athletic identity may have an indirect effect on alcohol use in athletes by moderating whether or not they follow athlete drinking norms. Athletes with high athletic identity are influenced by the drinking norms of the athletic culture they are currently in, so increased focus on shaping the social norms surrounding alcohol use in the athletic community would be key in effectively moderating the drinking behavior of athletes with high athletic identity. In addition, athletes with low athletic identity would benefit from a different approach since they are not as influenced by the athlete norm. Possibly focusing on the alcohol norms for the self-identities the athlete with low athletic identity rates high would be more effective.

A second factor to consider is competitiveness. No significant relationship was found between competitiveness and alcohol consumption in this research. This study did not specifically address participants' motives for drinking games, but competitiveness has been shown to be a significant motive in a college student's decision to participate in drinking games (Johnson & Sheets, 2004; Zamboanga et al., 2007). Drinking games directly lead to more binge drinking and alcohol consumption, so it remains important to consider the level of competitiveness in college athletes when monitoring alcohol use (Nagoshi et al., 1994). Finding healthy outlets outside of the sports arena and developing programs within the athletic department or university for athletes to express their competitiveness could be an effective way to keep athletes from participating in drinking games and cut down on alcohol consumption.

Drinking game participation was the one resoundingly significant variable directly related to alcohol use in the current research. The practical implications of the findings that

college athletes who participate in drinking games drink nine more alcoholic beverages in a week and have one more binge drinking episode than college athletes who do not participate in drinking games are important. The chances of negative health, financial, legal, social, and academic consequences for college athletes increase as alcohol use increases (Grossbard et al., 2007). In addition, college athletes who participate in drinking games and are actively participating in their sport are likely experiencing sport performance deficits due to their high levels of alcohol use. It seems evident that if an alcohol prevention program or treatment for college athletes is going to be effective, drinking game participation needs to be addressed. As mentioned earlier, managing drinking game participation can be done through addressing motives to participate like competitiveness. In addition, influencing the alcohol norms in the athletic culture to not include drinking games or to monitor the nature of drinking games through harm reduction strategies that decrease the amount of alcohol that is consumed during drinking games could be beneficial.

Level of sport participation should also be taken into consideration when designing prevention programs and administering treatment to college athletes concerning alcohol use. Unfortunately, a sample size large enough to explore differences among intercollegiate athletic teams was not obtained. However, when looking at differences between levels of sport participation, several important points were discovered. One point is that organized recreational athletes seem to have some factor outside the scope of this study influencing their drinking patterns. Whether it is the “beer league” culture or another variable it is important to consider the increased risk of binge drinking that accompanies playing organized recreational sports. Because this finding is relatively new and was only reported in one other published

empirical study (Ward & Gryczynski, 2007) further research is needed to substantiate this finding and clarify the forces behind these results.

Another important point is that a person's identification with the self-identity of athlete can be just as important as actual participation in sport. In addition, it was confirmed that sport participation does not predict a significant amount of unique variance in alcohol consumption when considering the other variables included in the study and when it is the only predictor. These findings can be interpreted to suggest that current sport participation may not be the only or best way to classify athletes when considering alcohol use. Once again this finding should be considered preliminary because it has only been directly demonstrated in this study.

Drinking game participation was a significant covariate for both binge drinking episodes and total alcohol consumption. Researchers should consider using drinking game participation as a covariate in future statistical analyses of the drinking behavior of college athletes. In addition, competitiveness was not found to be directly related to alcohol use in the current research, but in previous research it was found to motivate drinking game participation, which is directly related to alcohol use. The inclusion of competitiveness as a moderator of drinking game participation could be a useful statistical tool. When doing research on the effectiveness of social norms programs it is important to measure the athletic identity of the individuals being studied. If a person participating in sports does not identify with the self-identity of athlete then the social norms prevention program will not be as successful. This could be a reason for the mixed research results that currently exist for the effectiveness of social norms approaches. Controlling for athletic identity when doing statistical analyses can be another useful tool.

Developing a consistent definition of college athlete is also important for future studies. The inclusion of athletes with a high athletic identity score in the athlete category was demonstrated to be appropriate when looking at alcohol consumption. However, this research and Grossbard et al.'s (2009) are the only places this has been empirically supported. Further research is needed to confirm these findings and clarify the definition of college athlete.

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APPENDIX A: ATHLETIC IDENTITY MEASUREMENT SCALE

1. I consider myself an athlete.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
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2. I have many goals related to sport.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
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3. Most of my friends are athletes.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
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4. Sport is the most important part of my life.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
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5. I spend more time thinking about sport than anything else.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
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6. I feel bad about myself when I do poorly in sport.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
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7. I would be very depressed if I were injured and could not compete in sport.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
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APPENDIX B: GENERAL INFORMATION QUESTIONNAIRE

Please answer all of the following questions. We ask that you answer each as honestly and thoughtfully as possible and remind you that all information you provide is strictly confidential. Please do not skip any of the following questions. If you have any questions, be sure to ask. Unless otherwise indicated, **please circle your response or write it in the space closest to the question.** **Do not** use the spaces to the right of the page. Please do not answer with ranges (e.g., 10-15) or half amounts/decimals (e.g., 4.5 or 6 ½).

1. What is your gender?
 - (1) Male
 - (2) Female
2. What is your age? _____
3. How would you describe your ethnic background?
 - (1) Asian/Oriental
 - (2) Black/African American
 - (3) White/European American
 - (4) Hispanic/Latino
 - (5) Native American/American Indian
 - (6) Other _____

(Please specify)

4. What University do you attend?
 - (1) Indiana State University
 - (2) Indiana University
5. Are you a member of a fraternity or a sorority?
 - (1) Yes
 - (2) No
6. Please circle any of the following activities that you have participated in during the past 12 months:
 - (1) Intercollegiate sports, If yes, Please list what intercollegiate sport have you participated in the last 12 months? (ex: baseball, football, track & field, softball, soccer, etc.) _____
 - (2) Intramural sports
 - (3) Organized recreational sports on campus
 - (4) Organized recreational sports off campus (running, YMCA)
 - (5) Other sports, If yes, please list: _____
 - (6) No involvement in any type of sport

7. Below is a brief survey of drinking practices. It is essential for our research that you describe your drinking experience as accurately as possible so please be thoughtful about your selection of the appropriate descriptions. Please keep in mind that in all descriptions,

One Standard Drink =

A Standard Drink is...



**4 oz. glass of
wine**



12 oz. beer



1 pitcher = 6 drinks



**1 oz. hard liquor
Straight/mixed drink**



40 oz. = 4 1/2 drinks

7. Use the format below to describe your drinking pattern during a **typical week**. In the space on the left, Please fill in a number for each day of the week indicating the average number of drinks you consumed that day. For days you typically do not drink, enter a zero. If you are a non-drinker, enter all zeroes. **Please do not** enter a range of amounts, ½ amounts, or decimals per day (e.g., 10-12 per day or 3 ½ or 4.5 drinks per day). In the space on the right, answer the following question for each day of the week: Did you participate in any drinking games? Indicate with a **Y** for Yes or **N** for No.

[illegible]

APPENDIX C: SPORT ORIENTATION QUESTIONNAIRE

	Strongly Agree A	Slightly Agree B	Neither Agree nor Disagree C	Slightly Disagree D	Strongly Disagree E
1. I am a determined competitor.	A	B	C	D	E
2. I am a competitive person.	A	B	C	D	E
3. I try my hardest to win.	A	B	C	D	E
4. I want to be the best every time I compete.	A	B	C	D	E
5. I look forward to competing.	A	B	C	D	E
6. I thrive on competition	A	B	C	D	E
7. My goal is to be the best athlete possible.	A	B	C	D	E
8. I enjoy competing against others.	A	B	C	D	E
9. I want to be successful in sport	A	B	C	D	E
10. I work hard to be successful in sports.	A	B	C	D	E
11. The best test of my ability is competing against others.	A	B	C	D	E

- | | | | | | |
|---|---|---|---|---|---|
| 12. I look forward to the opportunity to test my skills in competition. | A | B | C | D | E |
| 13. I perform my best when I am competing against an opponent. | A | B | C | D | E |