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Research findings suggest that college student-athletes are at risk for using a variety of substances, especially alcohol, tobacco, and marijuana. One strategy that has shown promise in preventing substance use among student-athletes is programming rooted in the Social Norms Theory. Currently, social norms research among student-athletes in terms of injunctive norms (e.g., the perception of other people's approval of substance use) and descriptive norms (e.g., the perception of other people's substance use behaviors) is limited. Studies that have investigated injunctive norms held by student-athletes have not compared the effect of different reference groups on personal substance use behaviors. In terms of descriptive norms, past research has shown mixed findings. Some researchers have suggested that proximal norms are stronger predictors of personal substance use behaviors, while other researchers have contended that distal norms are stronger predictors. The purpose of this dissertation was to extend research on social norms reference groups held by student-athletes by comparing reference groups of injunctive norms and proximal-distal groups of descriptive norms. Specifically, this dissertation sought to answer the following research questions: (a) Do student-athlete perceptions of teammate and coach approval of substance use predict student-athlete substance use? (b) Do student-athlete perceptions of substance use by proximal and distal reference groups predict student-athlete substance use?

To answer the first research question, a convenience sample of 3,339 student-athletes from 54 NCAA colleges and universities completed a survey about their personal substance use and their perceptions of teammate and coach approval of substance use. A multi-level model regression analysis indicated that the perception of approval from both teammates and coaches predicted the participants' substance use behaviors. To answer the second research question regarding descriptive norms, a convenience sample of 3,347 student-athletes from 32 NCAA colleges and universities completed a survey about their personal substance use and their perceptions of substance use among close friends and college athletes. A multi-level model regression analysis indicated that only the perception of substance use among close friends acted as a predictor of participant substance use behaviors. This dissertation contains further explanations of the findings, recommendations for future research, and a description of the studies' methodological limitations.

THE ROLE OF PROXIMAL-DISTAL REFERENCE GROUPS  
FOR DESCRIPTIVE AND INJUNCTIVE NORMS  
ON COLLEGE STUDENT-ATHLETE  
SUBSTANCE USE

by

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Approved by

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Committee Chair

~To Jesus, my Father in Heaven, and the great Holy Spirit; You are everything to me. To Dad, Mom, P.T., and Kalen; thank you all so much for the encouragement and support, I could not have finished graduate school without you. I love you all so much.~

APPROVAL PAGE

This dissertation has been approved by the following committee of the Faculty of  
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## CHAPTER I

### INTRODUCTION

Substance use in the United States is a major health concern (Substance Abuse and Mental Health Services Administration, 2011), causing negative effects for both individuals and society as a whole. It is estimated that substance use costs the nation over \$600 billion each year in health problems, productivity loss, and crime-related issues. This figure accounts for the \$193 billion in costs for illegal drug use, \$193 billion for tobacco use, and \$235 billion for alcohol use (National Institute on Drug Abuse, 2012). These numbers help to measure the ill effects of substance use; however, there are also inestimable consequences at play, such as the contribution of substance use on domestic violence, breakdown of family structures, and poor academic performance (National Institute on Drug Abuse, 2012).

Research indicates that substance use behaviors vary from one subpopulation to another. There are some subpopulations that rarely use substances, such as devoutly religious and spiritual people (Chitwood, Weiss, & Leukefeld, 2008) or committed non-users like those in the Straight Edge Movement (Haenfler, 2004). On the other hand, various subpopulations have been shown to use substances at higher rates than the general population, such as sexual minorities (Marshal et al., 2008), fraternity and sorority members (Scott-Sheldon, Carey, & Carey, 2008), and homeless people (U.S. Department of Housing and Urban Development, 2010). It is important to target

prevention efforts toward subpopulations that are at high-risk for substance use, as these groups tend to suffer negative consequences of substance use more than other groups. The focus of this dissertation is on the subpopulation of college student-athletes.

### **Statement of Problem**

The use of substances among college student-athletes is disconcerting. Research indicates that a considerable proportion of student-athletes use alcohol (Ford, 2007b; Wechsler, Davenport, Dowdall, Grossman, & Zanakos, 1997), smokeless tobacco (Wechsler et al., 1997; Yusko, Buckman, White, & Pandina, 2008a), marijuana (Ford, 2007a; Wechsler et al., 1997; National Collegiate Athletic Association, 2012b), dietary supplements (Froiland, Koszewski, Hingst, & Kopecky, 2004), steroids (McCabe, Brower, West, Nelson, & Wechsler, 2007), and pain medications (National Collegiate Athletic Association, 2012b). Student-athletes report experiencing negative physical, social, and academic effects of substance use, such as having hangovers, developing respiratory problems, missing class, performing poorly in the classroom and on the field, fighting, drinking and driving, and taking sexual risks (Doumas, Turrisi, Coll, & Haralson, 2007; Hall & Degenhardt, 2009; Leichliter, Meilman, Presley, & Cashin, 1998, National Collegiate Athletic Association, 2012b; O'Brien, 1993).

Due to student-athletes' experience with substance use and related negative consequences, experts recommend that college administrators make every effort to address substance use among this subpopulation (Martens, Dams-O'Connor, & Beck, 2006; Turrisi, Mallett, Mastroleo, & Larimer, 2006). Substance use prevention among

student-athletes typically include policies (e.g., drug testing) and behavioral programming (e.g., drug refusal skills, motivational interviewing). One behavioral effort that has shown effectiveness in substance use prevention is educational intervention based upon the Social Norms Theory (Doumas, Haustveit, & Coll, 2010; LaBrie, Hummer, Huchting, & Neighbors, 2009; Martens, Kilmer, Beck, & Zamboanga, 2010; Perkins & Craig, 2006). This theory states that we often misperceive others' substance use behaviors, believing that "everybody" is doing it (also known as descriptive norms). For instance, 42% of college students in a national study perceived that the typical college student has used heroin at some point in their lives, when in actuality only 2% of college students have reported ever using it (American College Health Association, 2012). The Social Norms Theory also states that we often overestimate others' approval of substance use, known as injunctive norms. These descriptive and injunctive norms may motivate us to use substances in order to match our view of normal social behavior and opinion. On the other hand, the Social Norms Theory suggests that if we are taught that not everybody uses or approves of substance use, then our perceptions can be changed to reflect the actual substance use of those around us, motivating us to lower our own substance use (Berkowitz, 2005; Perkins, 2002a; Perkins, 2003).

Although research on the Social Norms Theory is growing, there are still gaps in the literature, especially in terms of the literature surrounding student-athletes. Recently, studies have measured student-athlete perceptions of others' use of alcohol and marijuana (Dams-O'Connor, Martin, & Martens, 2007; Doumas et al., 2010; LaBrie, Grossbard, &

Hummer, 2009; Page & Roland, 2004; Perkins & Craig, 2006; Turrisi, Mastroleo, Mallett, Larimer, & Kilmer, 2007), but have yet to investigate perceived use of other substances that are relevant to student-athletes, such as smokeless tobacco and steroids. In addition, there is a lack of research on injunctive norms held by student-athletes. Thus far, only three published studies (Hummer, LaBrie, & Lac, 2009; Mastroleo, Marzell, Turrisi, & Borsari, 2012; Lewis, 2008) have examined how student-athletes perceive others' approval of substance use and how those perceptions influence personal substance use behaviors. Conducting injunctive norms research among this population allows for testing norms that are unique to student-athletes, such as the perception of approval from coaches, athletic trainers, and athletic directors. Finally, research in this area has shown mixed findings in terms of how student-athletes view descriptive norms of various people groups. Some studies indicate that student-athlete perceptions of more relevant, or proximal, groups (e.g., teammates, close friends) are better predictors of personal substance use as compared to perceptions of less relevant, or distal, groups (e.g., college students in general) (Doumas et al., 2010; Grossbard, Hummer, LaBrie, Pederson, & Neighbors, 2009; Thombs & Hamilton, 2002). However, other studies show that perceptions of distal groups are better predictors of personal use (Dams-O'Connor et al., 2007; Thombs, 2000).

### **Purpose and Need of Study**

The purpose of this study is to address the gaps in the literature of Social Norms Theory as it applies to student-athletes. Specifically, this study aims to explore the

relationships between unique reference groups for injunctive norms held by student-athletes and explore the relationships between descriptive norms held by student-athletes towards proximal-distal reference groups. In addition, this study aims to understand the relationships between descriptive and injunctive norms of student-athletes and several substances, besides just alcohol or marijuana. These findings are needed to better inform prevention programming geared towards student-athletes. Understanding which injunctive norm reference groups predict personal substance use can help health professionals decide which injunctive norms should be targeted when creating and implementing social norms programs among student-athletes. Likewise, determining the ability of proximal and distal norms to predict personal substance use can help interventions to be framed around reference groups that are most relevant to student-athletes. The purpose of this dissertation will be achieved by answering the following research questions:

### **Research Questions**

Research Question #1: Do student-athlete perceptions of teammate and coach approval of substance use predict student-athlete substance use?

Research Question #2: Do student-athlete perceptions of substance use by proximal and distal reference groups predict student-athlete substance use?

### **Definition of Terms**

Student-athlete: Those who are enrolled in a college or university and who also participate in an intercollegiate sport.

Substance use:	The consumption of any legal or illegal drug.
Drink:	An alcoholic beverage (12 ounces of beer, 5 ounce glass of wine, 1.5 ounces of liquor).
High-risk:	Significant potential for using certain substances, usually because of belonging to a subpopulation of people who have a larger prevalence of substance use as compared to the general population.
Descriptive norm:	The perception of other people's substance use behaviors. This includes a perception, or estimation, of the proportion of people who use a certain substance (e.g., the percent of college student-athletes that use marijuana) and/or of the frequency of substance use (e.g., the average number of drinks that college student-athletes have per week).
Injunctive norm:	The perception of other people's approval of substance use. This includes a perception, or estimation, of the proportion of people who approve of substance use (e.g., the percent of college student-athletes that approve of marijuana use) and/or an overall estimation of approval from an entire group of people (e.g., college student-athletes do not/slightly/strongly approve of marijuana use).
Perception:	An estimation of other people's behaviors and/or approval of those behaviors.

- Misperception:** An overestimation or underestimation of other people's actual behavior and/or approval of substance use. For example, 42% of college students believe that the typical college student has used heroin at some point in their lives, but only 2% of students have reported doing so.
- Reference group:** A group of people that participants are asked to estimate descriptive or injunctive norms. For instance, the reference group in the following survey question would be 'close friends:' "What percentage of your close friends currently uses smokeless tobacco?"
- Proximal reference:** A reference group that is familiar and/or specific to the participant and is factually-based (e.g., close friends). For instance, "close friends" is a proximal reference group, in contrast to "the typical college student at your university."
- Distal reference:** A reference group that is less familiar and/or specific to the participant and potentially abstract in nature in comparison to another reference group. For instance, the "typical college student at your university" is a reference group that is less familiar/specific and abstract than a "close friend" reference group. In this example, the "typical college student at your university" reference group would be a distal in comparison to the "close friend" reference.

Heavy Episodic Drinking: Consuming 5 or more alcoholic drinks in one sitting.  
(Wechsler, Davenport, Dowdall, Moeykens, & Castillo,  
1994)

## CHAPTER II

### REVIEW OF THE LITERATURE

The purpose of this literature review is to provide an overview of college student-athlete substance use, describe a promising prevention strategy that can be targeted towards student-athletes, and highlight gaps in research that have yet to be addressed. First, this review will summarize student-athlete use of various substances (e.g., alcohol, tobacco, marijuana, performance enhancing drugs), the negative effects associated with each substance, and the differences in substance use that are specific to student-athletes (e.g., team affiliation, sex, culture). Second, this review will present a thorough description of the Social Norms Theory and how it is used within prevention programming for substance use, including among student-athlete populations. Finally, this review will draw attention to unstudied areas of the Social Norms Theory in terms of its application towards student-athletes and provide justification for the need to address these unknowns.

#### **Scope of the Problem**

##### *Student-Athlete Alcohol Use*

Research findings indicate that college student-athletes at all levels of competitive play (Divisions I, II, and III) and from every region of the United States are at high risk for alcohol use (Turrisi et al., 2006). When compared to non-athletes, student-athletes tend to drink more often, drink more on each occasion, and experience more negative

consequences from consuming alcohol (Doumas et al., 2007; Ford, 2007a, Grossbard, Hendershot, Larimer, Lee, & Neighbors, 2007; Hildebrand, Johnson, & Bogle, 2001; Leichliter et al., 1998; Meilman, Leichliter, & Presley, 1999; Nattiv & Puffer, 1991; Nelson & Wechsler, 2001; Wechsler et al., 1997). In a recent nationwide study conducted by the National Collegiate Athletic Association (NCAA), nearly 50% of student-athletes report that when they drink alcohol, they consume five or more drinks in one sitting (NCAA, 2012b), also known as “binge drinking” or heavy episodic drinking (Wechsler & Isaac, 1992; Wechsler & Nelson, 2001). This finding is alarming in comparison to the 36% of general college students across the nation who participate in heavy episodic drinking (Johnston, O’Malley, Bachman, & Schulenberg, 2012). Research indicates that heavy alcohol use typically results in negative consequences on college student health, social well-being, and academic performance (Perkins, 2002b, Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). Therefore, it is not surprising that a higher percent of student-athletes than non-athletes experience certain negative alcohol-related consequences (e.g., missing class, poor academic performance, fighting, destroying property, hangover, drinking and driving, risky sexual behaviors) (Core Institute, 2010; Doumas et al., 2007; Grossbard et al., 2007; Hildebrand et al., 2001; Leichliter et al., 1998, NCAA, 2012; Nelson & Wechsler, 2001).

Research also indicates that alcohol use may have detrimental effects on athletic performance, especially in terms of aerobic output and injury rates. In 1993, O’Brien published his classic study of the impact of a hangover on athletic performance. In his

study, O'Brien gave an aerobic test to 15 college rugby players. Afterwards, the rugby players were given money and instructed to consume the typical number of drinks that they would on a weekend night. The players reported drinking a range of 1 to 38 drinks. On the following day, the rugby players were tested again for aerobic performance. Surprisingly, the rugby players experienced the same decrease in aerobic performance from pre-test to post-test, regardless of the number of drinks consumed the previous night (O'Brien, 1993). The same author also conducted a study that compared the injury rates of over 400 athletes who self-reported alcohol use versus athletes that reported no alcohol use. The athletes who drank alcohol at least once per week had over twice the injury rate of those who did not drink (O'Brien & Lyons, 2000).

#### *Student-Athlete Tobacco Use*

When comparing the tobacco use of student-athlete and non-athletes, research shows a difference in prevalence with each type of tobacco. Specifically, research findings indicate that a lower percent of student-athletes than non-athletes smoke cigarettes, while the opposite is true of smokeless tobacco (Yusko et al., 2008a; Wechsler et al., 1997). Approximately 16% of student-athletes (vs. 30% of non-athletes) (Johnston et al., 2012) report smoking cigarettes within the past year (NCAA, 2012). Although low use of cigarettes among student-athletes is a positive finding, there is still concern about their use of smokeless tobacco (Levenson-Gingiss, Morrow, & Dratt, 1989; Walsh et al., 1994; Walsh et al., 1999), which is often at higher rates than non-athletes (Gingiss & Gottlieb, 1991; Lopez, 1988; Morrell, Cohen, Bacchi, West, 2005; Wechsler et al., 1997;

Yusko et al., 2008a). For instance, roughly 17% of student-athlete report using smokeless tobacco within the past year (NCAA, 2012), as compared to roughly 6% of general college students (Rigotti, Lee, & Wechsler, 2000), although it should be mentioned that the majority of use comes from male student-athletes who play ice hockey, baseball, and lacrosse (NCAA, 2012). The discrepancy in use of cigarettes and smokeless tobacco may be due to a higher percent of student-athletes who report being concerned of the negative effects on cigarettes on their health and performance as compared to smokeless tobacco (NCAA, 2012). The use of smokeless tobacco among student-athletes is a major area of concern, especially in light of its strong association with oral cancer, oral lesions, gum disease, tooth decay, and nicotine addiction (Centers for Disease Control and Prevention, 2011).

#### *Student-Athlete Marijuana Use*

Similar to cigarette use, a lower percent of student-athletes report using marijuana in the past year than non-athletes (Yusko et al., 2008a; Ford, 2007a; Wechsler et al., 1997) (23% student-athletes vs. 33% non-athletes) (Johnston et al., 2012; NCAA, 2012); however, health professionals still consider marijuana a drug of concern among the student-athlete population due to the large number of student-athletes who report using it and due to its negative effects on health and performance (Campos, Yonamine, & de Moraes Moreau, 2003; Eichner, 1993). Acute use of marijuana is associated with impairments in motor control and cognitive function (Ramaekers et al., 2006), traffic accidents (Li et al., 2012; Sewell, Poling, & Sofuoglu, 2009), and symptoms of anxiety

and panic (Hall & Degenhardt, 2009). Chronic use is often associated with cannabis dependence, respiratory illness, psychotic symptoms, low educational attainment, and subtle cognitive impairment (Hall & Degenhardt, 2009). The use of marijuana also results in consequences that are specific to athletes. While steroids are considered an ergogenic substance (e.g., substance that can increase athletic performance), marijuana is considered an “egolytic” substance (e.g., substance that can negatively impact performance), especially because of its negative effect on heart rate and cardiac stroke volume (Campos et al., 2003; Eichner, 1993). Studies show that marijuana has a negative effect on muscle fatigue, reaction times, and psychomotor skills (Renaud & Courmier, 1986; Tashkin, 1978), all of which could result in athletic injury or accidents on the field. In addition, marijuana’s impact on appetite and food intake may result in poor nutritional choices and increases in body weight (Foltin, Fischman, & Byrne, 1988), both having potentially detrimental effects on performance.

#### *Student-Athlete Supplement Use*

In terms of supplement use, the position held by the American Dietetic Association and the American College of Sports Medicine is that health professionals must evaluate the legality, safety, and need of each supplement that a student-athlete wants to take (Journal of the American Dietetic Association, 2000). Drug Free Sport, the company responsible for all NCAA drug testing, holds a more conservative view in that it does not recommend the use of any supplement by student-athletes, due to the under-regulation of supplements by the FDA, unknown purity or safety of supplements, and the

risk of having positive drug tests due to tainted supplements (Drug Free Sport, 2012). Regardless of the positions held by experts and authorities in the field, research suggests that a large proportion of student-athletes still use a wide range of supplements (Froiland et al., 2004; Sobal & Marquart, 1994). According to a recent national study, 14% of student-athletes have used creatine in the past year, 38% have used protein products, 12% have used weight gain products, 6% have used weight loss products, and 45% have used energy drinks (NCAA, 2012). Typically, student-athletes receive information about supplements from coaches, trainers, family, friends, and media (e.g., magazines, television); however, research suggests that these sources are questionable and may not always provide accurate or safe advice regarding supplement use (Burns, Schiller, Merrick, & Wolf, 2004; Jacobson, Sobonya, & Ransone, 2001; Kruskall & Johnson, 2001; Malinauskas, Overton, Carraway, & Cash, 2007; Smith-Rockwell, Nickols-Richardson, & Thye, 2001).

#### *Student-Athlete Steroid Use*

Although only about 1% of student-athletes have used anabolic steroids in their lifetime (NCAA, 2012), findings from four national surveys suggest there is a significant association between steroid use and participation in intercollegiate athletics (McCabe et al., 2007). Specifically, the studies indicate that student-athletes are nearly twice as likely to use steroids as non-athletes (McCabe et al., 2007). Student-athletes who use steroids report doing so in order to improve athletic performance or to treat sports-related injuries (NCAA, 2012). In addition, a study of over 500 student-athletes found that 12% of non-

steroid users involved with strength-related sports reported that they would use anabolic steroids if assured they would improve in performance and that they would test negative for the drug (Tricker & Connolly, 1997). The motivation and risk among student-athletes to use steroids is troubling, as steroid use has been associated with infertility, testicular atrophy, baldness, severe acne, tendon ruptures, high blood pressure, heart attacks, liver cancer, poor liver function, and cognitive effects of rage and mania (National Institute on Drug Abuse, 2006).

#### *Student-Athlete Pain Medication Use*

Research suggests that student-athletes are less likely than non-athletes to report using prescription drugs without a prescription from a doctor (Ford, 2008); however, student-athletes may have unique motivations for using and abusing pain medication, making it worthy of mention for this literature review. In the past year, nearly 5% of student-athletes have used strong prescription pain killers (e.g., Vicodin, Oxycontin, Percocet) without a prescription (NCAA, 2012). In one study, student-athletes were surveyed on their attitudes about pain medication, with results showing that 29% of student-athletes believed that it was okay to use painkillers on the day of a competition when injured in order to cope with pain. From the same study, 21% of the student-athletes reported that they would use painkillers in order to mask injury to continue playing their sport (Tricker, 2000). Using prescription medication without the direction of a doctor can result in serious negative health effects, such as addiction, overdose, psychosis, seizures, cardiovascular problems, and even death (National Institute on Drug Abuse, 2011).

### *Season, Division, and Sport Aspects of Student-Athlete Substance Use*

Research suggests that student-athletes tend to consume substances more often during the off-season than during in-season competition (Martens, Dams-O'Connor, & Beck, 2006; Martens, Dams-O'Connor, & Duffy-Paiement, 2006; Thombs, 2000; Yusko et al., 2008a). In a recent national study, 32% of student-athletes reported drinking alcohol only in the off-season, as compared to 54% that reported drinking in both the off-season and the competitive season. This finding was similar to other substance use, such as cigarettes (13% off-season vs. 8% both seasons) and marijuana (23% off-season vs. 9% both seasons) (NCAA, 2012). The increased use of substances during the off-season timeframe is not surprising, as research suggests that student-athletes do not use substances during competition in order to avoid potential negative effects on athletic performance (Martens, Dams-O'Connor, & Beck, 2006; NCAA, 2012). As competitive play comes to an end, student-athletes may feel free from the pressure of constant training, giving them more time to indulge in the social aspects of college life, which may include substance use (Martens, Dams-O'Connor, & Beck, 2006).

Studies indicate that a difference in substance use also varies depending upon student-athletes' level of competitive play. More student-athletes from Division III schools use substances than those from Division I or II, and more from Division II schools use substances than those from Division I schools. The NCAA's 2009 national survey reflects these differences from each Division (I, II, and III) for past-year use of several substances, such as cigarettes (12% vs. 16% vs. 18%), marijuana (17% vs. 21%

vs. 28%), and spit tobacco (16% vs. 17% vs. 18%) (NCAA, 2012). Researchers have yet to investigate the reasons behind such differences in substance use from division to division; however, higher substance use among Divisions II and III may be due to less stringent drug testing policies for these divisions (see Prevention Strategies for Student-Athletes subsection below) or that student-athletes from lower levels of competitive play experience less pressure to perform well, thus having less concern about the negative effects of substance use on performance during the in-season timeframe.

Research also indicates that substance use varies between sport participation (Martens, Watson, & Beck, 2006; NCAA, 2012). National studies suggest that for men's sports, more of those who participate in ice hockey, lacrosse, and baseball use substances than those involved in other sports. The opposite seems to hold true for those in running sports, using substances least often in comparison to other sports. For instance, heavy episodic drinking is most popular among hockey and baseball players and least popular among those in running sports (Ford, 2007b). Similarly, marijuana is used most often by hockey and lacrosse players and least by those in running sports (Ford, 2007b; NCAA, 2012). The same is true of cocaine and narcotic use, with a much larger percent of lacrosse players using than those in other sports (NCAA, 2012). Spit tobacco is used most by those in baseball, ice hockey, wrestling, and lacrosse and used least by runners (NCAA, 2012). This trend is similar for women's sports. Heavy episodic drinking is most popular among soccer players and least among runners (Ford, 2007b). Marijuana is used most by field hockey, lacrosse, and soccer players and used least by runners (NCAA,

2012). In terms of other substances like cocaine and narcotics, a much larger percent of lacrosse players use these substances than those in other sports (NCAA, 2012). Experts in the field suggest that a difference in substance use among sports may be due to varying social contexts and traditions held among teammates, team captains, and coaches of those sports (Anshel, 1991; Feltz, Warners, Gilson, & Santiago, 2011; Grossbard, Hummer, LaBrie, Pederson, & Neighbors, 2009; Hansen, 1997; Martens, Dams-O'Connor, & Beck, 2006; Mastroleo et al., 2012; Tomon & Ting, 2010).

#### *Sex and Race/Ethnic Aspects of Student-Athlete Substance Use*

Differences in substance use among student-athletes also exist between males and females. When compared to female student-athletes, a higher percent of male student-athletes use substances, including alcohol (Leichliter et al., 1998; Selby, Weinstein, & Bird, 1990; Wechsler et al., 1997; Wilson, Pritchard, & Schaffer, 2004), tobacco, and nearly each kind of illicit drug (NCAA, 2012; Wechsler et al., 1997; Yusko et al., 2008a). For instance, the NCAA's national survey indicates that 25% of male student-athletes have used marijuana in the past year, versus 18% of females (NCAA, 2012). Major differences are also evident in use of spit tobacco (27% vs. 2%), cocaine (2% vs. 1%), and cigarettes (17% vs. 14%) (NCAA, 2012).

Differences in substance use also exist between racial and ethnic groups. The NCAA's national survey indicates that, in general, substance use is most common among student-athletes who are White, Native Hawaiian, or Pacific Islander (NCAA, 2012). This finding is similar to that of other research studies. Wechsler and colleagues' national

survey found that student-athletes who were White were nearly 3 times as likely to engage in heavy episodic drinking when compared to other student-athletes (Wechsler et al., 1997).

## **Prevention Strategies**

### *Prevention Strategies for the General Student Population*

The U.S. Department of Education, the National Institute on Alcohol Abuse and Alcoholism (NIAAA), and the American College Health Association (ACHA) have published recommendations for effective substance use prevention programs on college campuses (ACHA, 2011; NIAAA, 2002; U.S. Department of Education, 2008). Their recommendations reflect an ecological model for health promotion (McLeroy, Bibeau, Steckler, & Glanz, 1988), targeting prevention efforts at societal and individual levels that might influence student substance use. Specifically, the Department of Education, NIAAA, and ACHA recommend that colleges adopt substance-related policies, provide substance-free events and programs, and implement various behavioral interventions.

In terms of policy, the Department of Education, NIAAA, and ACHA suggest that colleges create, implement, publicize, and enforce substance-related guidelines, such as prohibiting use of tobacco, restricting alcohol availability on campus, prohibiting alcohol-industry support and advertising, and consistently enforcing substance use violations (ACHA, 2011; NIAAA, 2002; U.S. Department of Education, 2008). They also recommend that campus organizations and programs collaborate as a community to address substance use. It is recommended that administrators from the Registrar schedule

classes on Fridays to prevent Thursday night partying, administration over campus transportation offer safe rides for intoxicated students, and leaders in student affairs provide alcohol-free social events and extend open hours of the library and fitness center (NIAAA, 2002; U.S. Department of Education, 2008). Regarding individual-based prevention, the Department of Education and NIAAA recommend implementation of programs that address student knowledge, attitudes, and beliefs, such as brief motivational enhancement, programming that challenges alcohol expectancies, and social norms media campaigns (NIAAA, 2002; U.S. Department of Education, 2008), which are described in further detail later in this review.

#### *Prevention Strategies for Student-Athletes*

Although student-athletes are part of a campus community and are exposed to general campus-wide substance use programming, experts in the field recommend that college administrators include prevention strategies that are specific to student-athletes, due to their increased risk of using certain substances (Martens, Dams-O'Connor, & Beck, 2006; Turrisi et al., 2006). From an ecological perspective, current prevention strategies specific towards student-athlete substance use involve policy (e.g., drug testing) and individual-based interventions. Drug testing is conducted by the NCAA and by each college or university. The NCAA initiated its drug testing in 1986 and now tests year-round for drugs at Division I and II schools and during championship events at each Division level. The ACHA recommends that colleges conduct testing separate of NCAA procedures (ACHA, 2009); however, administrators still may choose to not conduct their

own testing. Currently, 90% of Division I, 65% of Division II, and 21% of Division III schools conduct drug testing on top of NCAA testing (NCAA, 2012). Drug testing policies have been shown to be effective in deterring student-athletes from using substances. For instance, 10% of student-athletes from a national study reported that their main reason for avoiding marijuana was their fear of getting drug tested (NCAA, 2012). Additional substance use policy may come from head coaches of each college team. In this case, a head coach determines their team's alcohol policy during the in- and off-seasons (e.g., wet vs. dry season) and consequences for enforcement (Thombs, 2000; Williams, 2012). Research suggests that policies made by head coaches have an influence on substance use of team members (Thombs, 2000; Williams, 2012).

At the individual-level, several intervention efforts have been published specific to student-athletes. Most behavioral interventions have focused on preventing use of a single substance, typically smokeless tobacco (Darmody & Ehrich, 1994; Gansky et al., 2005; Masouredis et al., 1997; Walsh et al., 1999) or alcohol (Doumas et al., 2010; LaBrie et al., 2009; Perkins & Craig 2006; Thombs & Hamilton, 2002). Only a few interventions have attempted to target several substances at once (i.e., recreational drugs and performance enhancing drugs) (Marcello, Danish, & Stolberg, 1989; Tricker & Connolly, 1996). Prevention strategies used in the interventions have included simple drug education (Darmody & Ehrich, 1994; Gansky et al., 2005; Marcello et al., 1989; Masouredis et al., 1997; Tricker & Connolly, 1996; Walsh et al., 1999), motivational interviewing (typically with dentists or oral hygienists for smokeless tobacco prevention)

(Darmody & Ehrich, 1994; Gansky et al., 2005; Masouredis et al., 1997; Walsh et al., 1999), and skills-based training (e.g., decision making skills, drug refusal skills) (Marcello et al., 1989). Another prevention strategy for student-athletes, which is the focus of this dissertation, is programming rooted in the Social Norms Theory (Doumas & Haustveit, 2008; Doumas et al., 2010; LaBrie et al., 2009; LaBrie, Hummer, Grant, & Lac, 2010; Martens et al., 2010; Perkins & Craig, 2006; Thombs & Hamilton, 2002). Although Social Norms programming is just a piece of an ecological prevention strategy (Figure 1), it has shown promise in its effectiveness in drug prevention as an individual-based behavioral intervention.

#### *Social Norms Theory - Brief Overview*

According to the Social Norms Theory (Berkowitz, 2005; Perkins, 2002a; Perkins 2003), individuals often erroneously believe that a large portion of people engage in and approve of unhealthy behaviors, such as using substances. These overestimations of others' actual substance use behaviors and approval of such behaviors are known as "misperceptions." This theory states that misperceptions are caused by various social contexts (e.g., social observation, media portrayal of drug use) and may motivate individuals to use substances in order to fit their perceived view of normal behavior. Conversely, the Social Norms Theory argues that when individuals are educated about others' actual substance use behaviors and overall disapproval of use, individuals will tend to lower their own use of substances.

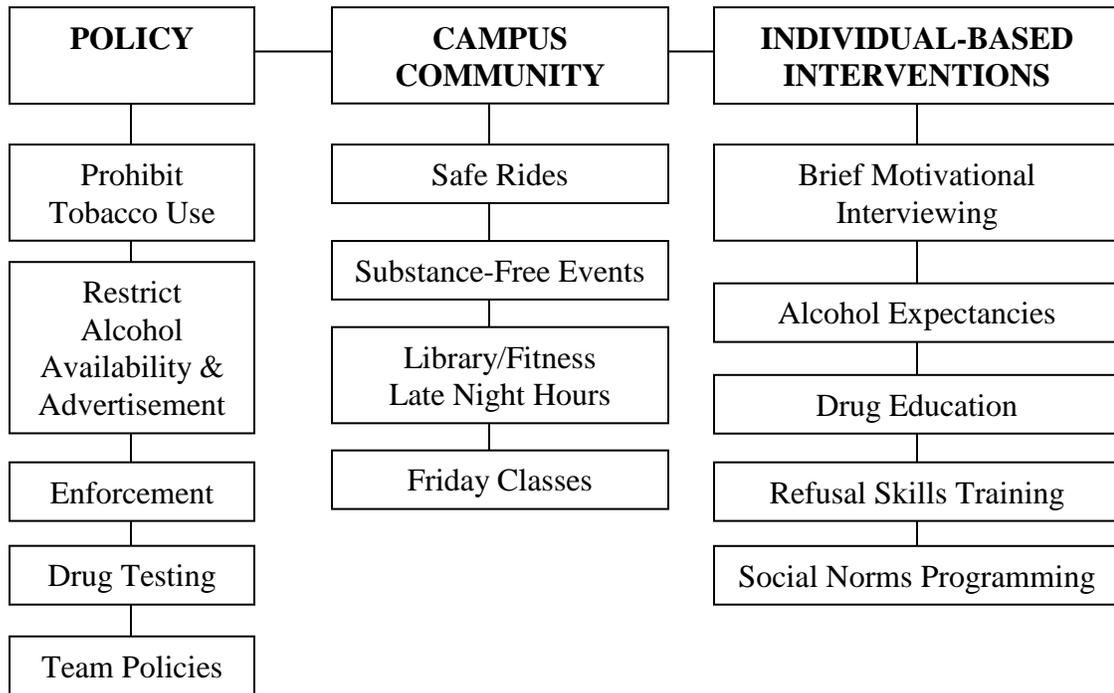


Figure 1. Prevention strategies for general students and student-athletes

### **Development of the Social Norms Theory**

#### *Perkins and Berkowitz' original study*

During the 1978-79 academic year, Perkins and Berkowitz conducted a study at Hobart and William Smith Colleges and discovered that students held several misperceptions in terms of the frequency and acceptability of alcohol use on campus. Specifically, the study's findings revealed that students misperceived that the campus community had an accepting attitude towards drunkenness, both being inconsistent with the study's data on overall student behavior and opinion towards alcohol consumption (Perkins & Berkowitz, 1986).

### *Subsequent Conformational Studies*

Over the next several decades, Perkins and Berkowitz's original findings were confirmed through a large number of research studies. Similar to Perkins and Berkowitz's research, later studies examined perceptions of both substance use and social opinion, also known as descriptive and injunctive norms. Descriptive norms refer to the perceptions of others' substance use behaviors (e.g., the perception of how many of one's peers smoke marijuana, how often one's peers smoke marijuana), while injunctive norms refer to the perceptions of other's acceptance of substance use (e.g., perception of peers' approval/disapproval of smoking marijuana) (Borsari & Carey, 2003; Cialdini, Kallgren, & Reno, 1990; Perkins, 2002a). Subsequent studies showed that perceptions of descriptive and injunctive norms were held by people of various age groups (e.g., middle school students (Hansen & Graham 1991; Perkins & Craig 2003; Thombs, Wolcott, & Farkash, 1997), high school students (Beck & Treiman, 1996; Haines, Barker, & Rice, 2003), college students (Perkins & Wechsler 1996; Moreira, Smith, & Foxcroft, 2009), non-student adults (Linkenbach, 2003; Linkenbach & Perkins, 2003a)) and that people held misperceptions about a wide range of substances, including alcohol (Moreira et al., 2009), tobacco (Eisenberg & Forster, 2003; Linkenbach, 2003), marijuana (Kilmer et al., 2006; Page & Roland, 2004; Page & Scanlon, 1999), and other drugs (e.g., cocaine, opiates, hallucinogens, sedatives, inhalants, amphetamines, MDMA, alcohol-energy drink cocktails) (ACHA, 2009; ACHA, 2012; Marzell, 2011; Perkins, Meilman, Leichter, Cashin, & Presley, 1999).

Studies subsequent to Perkins and Berkowitz' original research have also shown that people have misperceptions regarding a wide variety of problem behaviors outside of substance use, including risky sexual behaviors (Carvajal et al., 1999; Lewis, Lee, Patrick, & Fossos, 2007; Martens, Page, Mowry, Damann, Taylor, & Cimini, 2006; Messer, Shoe, Canady, Sheppard, & Vincus, 2011; Scholly, Katz, Gascoigne, & Holck, 2005; Stephenson & Sullivan, 2009), gambling (Larimer & Neighbors, 2003; Raisamo & Lintonen, 2012), bullying (Bigsby, 2002; Bowen & Bourgeois, 2001), and body image (Bergstrom & Neighbors, 2006; Eisenberg, Neumark-Sztainer, Story, & Perry, 2005; Grossbard, Neighbors, & Larimer, 2011; Perkins, & Craig, 2010; Sanderson, Wallier, Stockdale, & Yopyk, 2008). For instance, in 2003, researchers surveyed over 300 college students to investigate student perceptions of gambling behaviors. Participants overestimated others' gambling behaviors and others' approval of gambling, which were both unique predictors of personal gambling behavior (Larimer & Neighbors, 2003). In 2006, researchers surveyed over 800 college students at a large university to examine perceptions of sexual behaviors. Students perceived that the typical student at their university had more sexual partners and had more sex than what was self-reported by students (Martens, Page, Mowry, Damann, Taylor, & Cimini, 2006).

#### *Subsequent Findings on Descriptive Norms*

The research following Perkins and Berkowitz' groundbreaking study showed that people's perceptions of substance use behaviors are often highly exaggerated in comparison to actual rates of substance use. A prime example of such perceptions can be

seen in data from the National College Health Assessment (NCHA), a nationwide health survey conducted by the ACHA every semester involving nearly 100,000 college students from 140 institutions. In the Spring of 2012 NCHA, 80% of students perceived that the typical college student had smoked cigarettes within the past 30 days of being surveyed, when in reality only about 14% had used cigarettes (ACHA, 2012; Johnston et al., 2012). This overestimation was similar for past 30-day use of other substances as well, such as marijuana (82% perceived use vs. 16% actual use), hookah (68% perceived use vs. 8% actual use), cocaine (33% perceived use vs. 1% actual use), and so on (ACHA, 2012). Similar to Perkins and Berkowitz' original findings, research studies have consistently shown that an association exists between perceptions of others' use and personal use; specifically, descriptive norms is a strong predictor in personal substance use behaviors, with increased perceptions being associated with increased rates of personal consumption (Borsari & Carey, 2001; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Perkins, Haines, & Rice, 2005; Perkins & Wechsler, 1996).

#### *Subsequent Findings on Injunctive Norms*

While descriptive norms reflect perceptions of others' behavior, injunctive norms reflect the perception of moral standards, that is, the perception of others' approval or disapproval of substance use (Borsari & Carey, 2001; Cialdini et al., 1990). Injunctive norms, also known as subjective norms, have been used as a construct in other theories (i.e., Theory of Reasoned Action, Theory of Planned Behavior, Integrated Behavior Model) (Ajzen, 1991; Fishbein & Ajzen, 1975; Montaña & Kasprzyk, 2008) to help

explain behavior, with the premise being that people's behavioral intentions are affected by the opinion of others. Perkins and Berkowitz' initial investigation of perceptions regarding substance use (1986) found that perceptions of others' opinion regarding approval of use were exaggerated. In particular, the authors found that nearly 63% of the study's sample of college students (N = 1,116) perceived that the "general campus attitude" was that getting drunk occasionally or frequently is "okay," even if it interferes with grades or responsibilities; however, only 19% of the sample actually held this attitude towards drinking (Perkins & Berkowitz, 1986). Likewise, several recent studies have also found that people tend to overestimate their peers' approval of substance use (Agostinelli, Grube, & Morgan, 2003; Alva, 1998; Baer, 1994; Barnett, Far, Mauss, & Miller, 1996; Carey, Borsari, Carey, & Maisto, 2006; Prentice & Miller, 1993; Schroeder & Prentice, 1998) and that such perceptions are related to one's personal substance use (Borsari & Carey, 2001; Borsari & Carey, 2003; Larimer, Turner, Mallett, & Geisner, 2004; Perkins & Wechsler, 1996).

#### *Subsequent Findings on Changing Norms*

Initial studies about descriptive and injunctive norms were cross-sectional in design. Although these cross-sectional studies were able to establish an association between perceptions and personal substance use, they were unable to make any inferences about causality. However, researchers soon began conducting intervention studies to create change in participant perceptions of others' substance use. Their goal was to change participants' perceptions to reflect a more accurate view of others' use, which

would hopefully encourage participants' to lower personal substance use (Berkowitz, 2005). In 1989, Haines conducted the first social norms intervention. At baseline, college students (n = 779) from a large university perceived that 69% of students at the university engaged in heavy episodic drinking in the 2-weeks prior to being surveyed, while only 45% reported doing so. Haines then conducted a year-long mass media campaign (through the student newspaper, workshops, lectures, and so on) to educate the student population about the actual rates of campus drinking. At post-test, participants' (n = 716) perceived that less (57%) of the students at the university had engaged in heavy episodic drinking. Also, a lower percent of participants (38%) reported heavy episodic drinking at post-test (Haines, 1996). Haines' intervention study did not include a control group, which limited the ability the findings to determine cause and effect of the intervention; however, the study did suggest that behavior could possibly change with altered perceptions. Since Haines' study, several rigorous interventions have been conducted, and reviewed, on how changed perceptions can affect personal substance use (Berkowitz, 2005; Lewis & Neighbors, 2006a; Moreira, Smith, & Foxcroft, 2009). One such study was conducted by Neighbors and colleagues in 2004. In the study, 252 college students were randomly assigned to control and intervention groups. In the intervention, students completed a computer-based module that asked the students to estimate campus drinking behavior. Their estimation was then compared to self-reported drinking behaviors of other students on campus in order to show any discrepancy between perceived and actual use. When compared to the control group, the intervention group had significantly lower

perceptions of others' drinking and lower personal alcohol consumption, in terms of both frequency and quantity, at 3- and 6-month follow-up surveys (Neighbors, Larimer, & Lewis, 2004).

## **The Social Norms Theory**

### *Principles of the Social Norms Theory*

The accumulation of research findings on misperceptions of substance use and its role as a predictor in personal consumption inspired Perkins and Berkowitz to develop several theoretical principles about the phenomena (Berkowitz, 2005; Perkins, 1997; Perkins, 2002a; Perkins, 2003). These principles were later shaped into the Social Norms Theory (Table 1), a description of the social, psychological, and behavioral underpinnings regarding people's perceptions of normal behavior and societal attitudes concerning substance use (Berkowitz, 2005; Perkins, 1997; Perkins, 2002a; Perkins, 2003). The key principles behind the Social Norms Theory are that misperceptions of others' behaviors/attitudes regarding substance use may result in personal consumption of substances in order to "fit in" with the perception of social normality; fortunately, the Social Norms Theory also argues that when these misperceptions are corrected, people will tend to lower their own substance use towards the actual prevalence rates of substance use (Berkowitz, 2005).

### *Causes of Misperceptions*

Besides describing the existence and effect of misperceptions, the Social Norms Theory also postulates the "why" of misperceptions, why they exist and how they are

formed within society. Perkins borrowed ideas from Attribution Theory, mechanisms of social conversation, and studies on cultural media as a basis for his explanation behind the cause of misperceptions (Perkins, 1997; Perkins, 2003). According to Perkins, Attribution Theory suggests that we often attribute the observed behavior of unfamiliar people to their personality traits, instead of considering the possibility of environmental causes of behavior or bearing in mind that the certain observed behavior may just be a rare occurrence. For example, if a college student were to observe a drunk person at a party, he or she might attribute the drunkenness as a characteristic of that person (e.g., this person is a drunkard), rather than possible external circumstances (e.g., they just failed a class, they just broke up with boyfriend/girlfriend) or an unusual event (e.g., attending a celebratory party, accidentally drinking more than intended). These attributions could then be generalized to broader peer networks, creating a misperception that drunkenness is a character trait of college students from that entire network (Perkins, 1997; Perkins, Perkins, 2003).

Perkins also suggested that the mechanisms surrounding observation and social conversation play a strong role in how misperceptions are formed. Observing a drunken person at a party can often be shocking or humorous, as they may act or speak in an amusing way or even become violent or physically ill. Even though a majority of those at the party may have been drinking responsibly or not drinking at all, the salient memories from the party are often of those acting extravagantly. These behaviors are talked about afterwards in conversation from both the drunken people and those who

were simply in attendance (Perkins, 1997; Perkins, 2003). These “drinking stories” are deeply embedded in college culture and help define students’ social expectations of partying (Colby, Colby, & Raymond, 2009; Workman, 2001). According to Perkins, such storytelling is not typically focused on the majority of people who were acting responsibly, but on the more interesting behaviors of the “wasted” or “stoned” persons. As drinking stories are told and listened to, and a lack of attention-grabbing stories are told about responsible behavior (i.e., studying, drinking within one’s limits), a misperception can form that “everybody” goes to parties, gets drunk or “high,” and acts recklessly (Perkins, 1997; Perkins, 2003).

Finally, Perkins theorized that media outlets are also major contributors to misperceptions about substance use. The music, film, and television industries frequently mention or portray substance use, often in a glamorized way, which can enhance the perception that substance use is common and socially acceptable. Moreover, print and electronic news outlets give considerable attention to issues surrounding substance use and related problems, as compared to minimal news coverage on the majority of people who choose to behave in healthy ways. Constantly being exposed to headlines about substance use may contribute to the misperception that a large percent of people use substances (Perkins, 2003). Perkin’s view on the power of media regarding misperceptions is not without evidence. In 2000, researchers surveyed over 200 moviegoers and found that descriptive norm misperceptions about cigarette smoking were more exaggerated among those who watched movies frequently as compared to those that

did not (Dixon, Hill, Borland, & Paxton, 2001).

### *Proximal and Distal Reference Groups*

Although Social Norms Theory suggests that people overestimate others' problem behaviors, the theory does not specify who the "others" are (Berkowitz, 2005). Within the literature, research studies are varied in how the "others," also known as reference groups, are described. For instance, the NCHA (ACHA, 2012) asks participants: "Within the last thirty days, how often do you think the typical student at your school used marijuana?" In this particular survey item, the reference group that participants were asked to estimate substance use of was "the typical student at your school." Other research projects have used even broader, or distal, reference groups in relation to participants, such as "typical college student" (Borsari & Carey, 2000) or "most students" (Haines, 1996), which imply the average college student from the entire nation as opposed to the average student attending a particular college. On the other hand, some studies have used survey items that refer to groups of people that are more relevant, or proximal, to the participants' lives. For example, studies have asked for participants' perceptions of substance use from their "best friend" (Baer & Carney, 1993) or "closest friends" (Lee, Geisner, Lewis, Neighbors, & Larimer, 2007). Proximal reference groups have also been used in Social Norms Theory research on certain subpopulations, such as using a "Greek men" reference group for studies regarding fraternity members (Carter & Kahnweiler, 2000) and a "typical teammate" reference group for studies with a focus on student-athletes (Thombs, 2000).

Table 1. Assumptions of Social Norms Theory

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1. Actions are often based on misinformation about or misperceptions of others' attitudes and/or behavior.
  2. When misperceptions are defined or perceived as real, they have real consequences.
  3. Individuals passively accept misperceptions rather than actively intervene to change them, hiding from others their true perceptions, feelings, or beliefs.
  4. The effects of misperceptions are self-perpetuating, because they discourage the expression of opinions and actions that are falsely believed to be nonconforming, while encouraging problem behaviors that are falsely believed to be normative.
  5. Appropriate information about the actual norm will encourage individuals to express those beliefs that are consistent with the true, healthier norm, and inhibit problem behaviors that are inconsistent with it.
  6. Individuals who do not personally engage in the problematic behavior may contribute to the problem by the way in which they talk about the behavior. Misperceptions thus function to strengthen beliefs and values that the "carriers of the misperception" do not themselves hold and contribute to the climate that encourages problem behavior.
  7. For a norm to be perpetuated it is not necessary for the majority to believe it, but only for the majority to believe that the majority believes it.

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*Note.* From Berkowitz (2005)

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Proximal and distal reference groups are important issues in Social Norms Theory. Research studies indicate that participants often have varying perceptions of different reference groups used in survey items. Typically, participants perceive substance use of distal reference groups to be higher than proximal reference groups (Agostinelli et al., 2003; Borsari & Carey, 2003; Carey et al., 2006; Larimer et al., 2009; Martens, Dams-O'Connor, Duffy-Paiement, & Gibson, 2006). In fact, studies indicate that as a reference group becomes more distal in relevance to the participant, perceptions of that group become more distorted. For instance, in a study by Lewis and Neighbors (2006), 182 undergraduate students were asked to describe what demographics came to their mind when surveyed about estimating the drinking behaviors of the “typical college student.” Nearly all male (95%) and almost half (48%) of all female participants pictured the typical college student as being male. This finding is not surprising. Students on any college campus are not uniform in demographics, cultures, values, etc. Different social theories (e.g., Social Identification Theory, Social Comparison Theory, Social Impact Theory) argue that people identify with groups they belong to and are better able to grasp and evaluate information regarding those groups as compared to groups of people they are unfamiliar with (Festinger, 1954; Hogg & Abrams, 1988; Latane, 1981; Tajfel & Turner, 1986), such as trying to imagine the “typical” college student and their substance use behaviors. Research indicates that estimations of substance use for proximal reference groups, as compared to distal groups, tend to reflect the participants’ personal substance use behaviors. For instance, researchers in one study asked over 1,000 undergraduate

students to estimate descriptive drinking norms of several reference groups ranging in proximity to the participants, including: typical student, same gender, ethnicity, residence, and various combinations of certain groups. The study's results indicated that participants' perceptions of proximal groups, at any level, was more related to personal drinking behavior as compared to perceptions of more distal groups (Larimer et al., 2009).

#### *Reference Groups for Injunctive Norms*

Recently, research on injunctive norms has measured people's perceptions of substance use approval from various reference groups, which are usually important on some level to participants. Reference groups have included entire communities (Song, Smiler, Wagoner, & Wolfson, 2012), parents (Lo, 1995; Substance Abuse and Mental Health Services Administration, 2011), typical college students (Park, Klein, Smith, & Martell, 2009), typical college athletes (Hummer, LaBrie, & Lac, 2009), high school coaches (Mastroleo, Marzell, Turrisi, & Borsari, 2012), fraternity/sorority members (Larimer, Turner, Mallett, & Geisner, 2004), resident assistants (Perkins 2002a), and close friends (Patrick, Neighbors, & Lee, 2012).

Similar to findings on descriptive norms, research shows that participants tend to have greater perceptions of others' approval of substance use as reference groups become more distal in nature. Also similar to research in descriptive norms, research suggests that perceptions of approval towards proximal reference groups tend to reflect personal substance use as compared to perceptions of distal reference groups (Agostinelli et al.,

2003; Neighbors et al., 2008; Patrick et al., 2012). In 2003, Agostinelli and colleagues asked over 2,500 high school students to rank their perceived disapproval of drinking of their best friend, other good friends, most students their age at their own school, and most students their age at other schools. As the reference groups became more distal in relationship to the participants, students perceived that most students at their school and other schools had more accepting attitudes of alcohol use as compared to their best friends or other good friends (Agostinelli et al., 2003).

#### *Social Norms Theory Interventions*

The goal of a Social Norms Theory-based intervention is to correct a target population's exaggerated perceptions of others' substance use, which is done by informing the target population about the discrepancy between their perceptions and others' actual behavior/opinion regarding substance use. According to Social Norms Theory, a decrease in these exaggerated perceptions may result in lower substance use behaviors of the target population. College-based interventions typically include marketing campaigns, group workshops, or individual counseling sessions (Berkowitz, 2005). Campus-wide mass media marketing campaigns (e.g., mass e-mails, flyers, posters, table tents) are meant to impact the entire student-body. On the other hand, group workshops are typically used when an intervention is focused towards a college subpopulation known for a high prevalence of substance use, such as fraternities, sororities, and student-athletes. Individual counseling sessions are meant to address the perceptions held by someone who exhibits signs of substance abuse (Berkowitz, 2005).

Besides choosing which method of intervention to use (e.g., marketing campaign, workshop, counseling session), one must also decide which reference group should be used for the intervention's informational content to inform the target audience about the discrepancy between perceptions and others' actual behaviors/opinions regarding substance use. The reference group that is chosen will determine the amount of resources needed to gather information about that group's accurate substance use behaviors (Berkowitz, 2005). A distal reference group may require fewer resources to gather information about as compared to a proximal reference group. For instance, suppose that an intervention targeted towards student-athletes was framed around accurate substance use behaviors of a distal reference group, such as college student-athletes in general. To gather information about substance use of student-athletes as a whole, one would have to go online and locate national data that is easily available. On the other hand, if that same intervention was framed around a more proximal reference group, such as student-athletes at the particular college of interest, then that reference group must be recruited and surveyed about their personal substance use behaviors. Once analyzed, the survey data can be used for the intervention. If the reference group is even closer in proximity to the target population, such as close friends, then each participant's close friends must be located and surveyed about personal substance use behaviors.

#### *Critique of the Social Norms Theory – No Changes in Perception*

It is important to note that some researchers have critiqued the Social Norms Theory due to intervention efforts that caused non-significant decreases in substance use

perceptions and/or behaviors (Granfield, 2002; Thombs, Dotterer, Olds, Sharp, & Raub, 2004; Wechsler et al., 2003; Werch et al., 2000). However, the Social Norms Theory is not necessarily discredited by the critiques, due to limitations of those studies, including ineffective program efforts towards changing perceptions and poor research methods (Perkins, Haines, & Rice, 2005).

Some researchers have critiqued the Social Norms Theory in their studies that found substance use behaviors were not affected by an intervention. However, these intervention studies have been limited by not changing the perceptions of participants. In 1999, Werch and colleagues randomly assigned 634 students to an intervention or control group. Throughout the fall semester, the intervention group received three greeting cards and a brief telephone call that described accurate statistics of drinking prevalence on campus. The study's findings indicated a non-significant difference in the intervention group's personal drinking behavior at post-test (Werch et al., 2000). However, Werch's intervention failed to change the perceptions of the control and intervention group from pre- to post-test. Although the intervention was not effective in altering behavior, it did not disqualify the Social Norms Theory, which requires a change in perception in order to affect behavior (Perkins, Haines, & Rice, 2005).

Likewise, Polonec and colleagues conducted a year-long campus-wide social norms intervention that failed to change perceptions and behaviors. The intervention consisted of a social norms media campaign that tried to correct student perceptions of heavy episodic drinking, using a campaign message of "most students on campus drink 0

to 4 drinks when they party.” Findings suggested that heavy episodic drinking increased from 36% at pre-test to 49% at post-test. The limitation of Polonec’s study was similar to Werch’s, in that student perceptions were not impacted by the intervention. At post-test, 73% of the participants (n = 277) reported that they did not believe the intervention’s mass media campaign message that most students drink 0 to 4 drinks when partying (Polonec, Major, & Atwood, 2006).

In a national study, Wechsler and colleagues analyzed data from 98 colleges that participated in the Harvard School of Public Health College Alcohol Study. Researchers compared alcohol use of students who were exposed to social norms interventions to those who were not. Exposure to an intervention was measured by a single survey question that asked one administrator if their college “had ever conducted a social-norms campaign to decrease alcohol use and related problems on campus.” The study’s findings suggested there was no difference in drinking behaviors between students who were exposed to a social norms campaign versus those who were not (Wechsler et al., 2003). Wechsler’s study, however, was limited in that it did not measure differences in campaign implementation (e.g., duration, intensity, saturation) or student perceptions. Therefore, it could not allow for inferences to be made about the effect of each social norms campaign in changing perceptions of students, which could then be compared in relation to behavior change (Perkins, Haines, & Rice, 2005).

### *Critique of the Social Norms Theory – Changes in Perception*

Other researchers have critiqued the Social Norms Theory because of intervention studies that may have changed a target population's perceptions, but did not change substance use behavior. These critiques, however, were limited by research methodologies and selective interpretations of data. In one critique, Clapp and colleagues conducted a 6-week social norms campaign in two college dormitories, one experimental and one comparison. The campaign message was that most students at that college drink "0, 1, 2, 3, or 4 drinks when they party." Those in the experimental dormitory significantly decreased their perception of how many drinks students consume at parties; however, those in the experimental dormitory did not have significant decreases in their personal number of drinks per occasion and, surprisingly, increased the number of days they drank in the past month relative to those in the comparison dormitory (Clapp, Lange, Russell, Shillington, & Voas, 2003). However, the total number of drinks consumed in the past month remained the same for those in the experimental dormitory but increased for those in the comparison, meaning that the number of drinks consumed per occasion was spread out for the experiment dormitory but increased for the comparison group. Therefore, the intervention may have been successful in changing drinking behavior, depending on how the behaviors were viewed by those reading the study's publication (Perkins, Haines, & Rice, 2005).

Lewis and colleagues conducted an intervention that sent college students a birthday card one week before their 21st birthday. The card contained statistics about the

typical amount of alcohol consumed during 21st birthday celebrations. Those assigned in the experiment group had decreased perceptions of alcohol consumption during 21st birthday parties, but did not have significantly lower number of drinks consumed during their birthday. Even though the intervention failed to produce changes in behavior, the study still supported the Social Norms Theory by finding that those with lower perceptions of drinks consumed during 21st birthday parties, regardless of experiment or control group, was significantly associated with a lower number of drinks consumed during one's own party (Lewis, Neighbors, Lee, & Oster-Aaland, 2008).

### **Student-Athlete Social Norms**

#### *Alcohol and Marijuana*

In the past decade, several studies regarding Social Norms Theory have focused on college student-athlete substance use, particularly their use of alcohol and marijuana. Findings from these studies have been consistent in showing that student-athlete descriptive and injunctive norms are strong predictors of personal substance use (Dams-O'Connor, Martin, & Martens, 2007; Doumas, Haustveit, & Coll, 2010; Frye, Allen, & Drinnon, 2010; Grossbard, Hummer, LaBrie, Pederson, & Neighbors, 2009; Grossbard, Geisner, Mastroleo, Kilmer, Turrisi, & Larimer, 2009; Hummer, LaBrie, & Lac, 2009; LaBrie, Grossbard, & Hummer, 2009; Martens, Dams-O'Connor, & Beck, 2006; Page & Roland, 2004; Perkins & Craig, 2006; Thombs, 2000; Thombs & Hamilton, 2002; Turrisi, Mastroleo, Mallett, Larimer, & Kilmer, 2007). Interventions using Social Norms Theory that have been specifically targeted towards student-athletes have resulted in

considerable changes in perceptions and substance use behaviors (Doumas & Haustveit, 2008; Doumas, Haustveit, & Coll, 2010; LaBrie, Hummer, Huchting, & Neighbors, 2009; LaBrie, Hummer, Grant, & Lac, 2010; Martens, Kilmer, Beck, & Zamboanga, 2010; Perkins & Craig 2006; Thombs & Hamilton, 2002).

### *Descriptive Norms*

In terms of descriptive norms, findings have been inconsistent in terms of how student-athletes view relevant proximal and distal reference groups (i.e., typical college athlete, athletes at your university, typical teammate, closest athlete friend, closest non-athlete friend). The findings from one study suggested that perceptions of proximal groups, versus distal, are more strongly associated with personal substance use of student-athletes. In the study, researchers found that student-athlete perceptions of their “closest athlete friend” drinking behaviors had the strongest relationship with personal alcohol use when compared to perceptions of their “closest non-athlete friend” drinking behaviors (Martens, Dams-O'Connor, Duffy-Paiement, & Gibson, 2006). On the other hand, the findings from a different study indicated that perceptions of distal reference group alcohol use may be better predictors of personal alcohol use. Dams-O'Connor, Martin, & Martens (2007) tested descriptive norms of four reference groups (closest athlete friend, closest non-athlete friend, typical athlete, typical non-athlete) and found that perceptions about the typical athlete reference group, more so than closest athlete friend, was the better predictor of personal alcohol use. Yet another research study suggested that proximal and distal descriptive norms are equivalent predictors of student-athlete drinking behaviors. In

2000, Thombs conducted a multiple discriminant function analysis on nearly 300 student-athletes to assess the ability of norms to discriminate among different drinking patterns. Thombs found that the “typical teammate” and “typical student on campus” reference groups had nearly equal discriminatory power to the study’s function analysis (Thombs, 2000).

### *Injunctive Norms*

Research on injunctive norms held by student-athletes is limited. To the authors’ knowledge, only two studies have examined student-athlete perceptions of others approval of substance use. One study tested injunctive norms held towards a “typical athlete” reference group and found that the norms were a strong predictor for personal attitudes towards drinking (Hummer et al., 2009). The other study was a multiple discriminant function analysis that tested which of 15 different variables classified student-athletes as binge drinkers or non-binge drinkers. The study found that only a few variables were associated with binge drinking, including one’s perceptions of their coaches’ attitudes towards alcohol use (Lewis, 2008).

### **Future Directions**

Although research involving Social Norms Theory has grown considerably since Perkins and Berkowitz’ groundbreaking study, there are still gaps in knowledge that need to be addressed, especially when considering social norms held by student-athletes. Currently, social norms research on student-athletes has only examined perceptions about alcohol and marijuana use (Dams-O’Connor, Martin, & Martens, 2007; Dumas,

Haustveit, & Coll, 2010; Frye, Allen, & Drinnon, 2010; Grossbard, Geisner, Mastroleo, Kilmer, Turrisi, & Larimer, 2009; Grossbard, Hummer, LaBrie, Pederson, & Neighbors, 2009; Hummer, LaBrie, & Lac, 2009; LaBrie, Grossbard, & Hummer, 2009; Martens, Dams-O'Connor, Duffy-Paiement, & Gibson, 2006; Mastroleo, Marzell, Turrisi, & Borsari, 2012; Page & Roland, 2004; Perkins & Craig, 2006; Thombs, 2000; Thombs & Hamilton, 2002; Turrisi, Mastroleo, Mallett, Larimer, & Kilmer, 2007). It is still unknown how student-athletes perceive use of other substances (e.g., smokeless tobacco, supplements, steroids), in terms of both descriptive and injunctive norms. Understanding how student-athletes perceive others' use of several substances is important for creating effective, targeted prevention programming towards this high-risk population regarding substances relevant to student-athletes other than alcohol and marijuana.

In addition, social norms research on student-athletes is mixed in terms of proximal-distal reference groups for descriptive norms. Some studies indicate that distal reference groups are stronger predictors of personal use (Dams-O'Connor, Martin, & Martens, 2007; Thombs, 2000), while other studies suggest that proximal reference groups are better predictors (Martens, Dams-O'Connor, Duffy-Paiement, & Gibson, 2006; Thombs, 2000). More studies are needed to determine the difference between proximal-distal reference groups on personal substance use behaviors among student-athletes. Understanding this difference will have practical implications on future social norms interventions targeted towards student-athletes. For instance, if future research indicates that perceptions about a proximal reference groups are better predictors of personal

substance use, then social norms interventions might be better framed around perceptions of proximal reference groups (e.g., teammates), as opposed to structuring the intervention around perceptions of a more distal group (e.g., typical athlete). Another implication of such a finding would be in terms of resources. As mentioned earlier (see subsection Social Norms Theory Interventions), a different amount of resources are required for gathering information about a proximal reference group and compared to a distal reference group. Therefore, if future research indicates that proximal norms are better predictors of personal substance use, then health professionals would need to spend more time and energy gathering data about that reference group's substance use behaviors as compared to that of a distal reference group.

Finally, there is an opportunity to research unique injunctive norms held by student-athletes. College student-athletes have distinctive relationships that are not shared by general college students, such as relationships with coaches, teammates, team captains, athletic directors, athletic trainers, and so on. Since injunctive norms are the perception of others' approval of certain behaviors, it seems likely that student-athletes would perceive that coaches, teammates, and so on, approve or disapprove of substance use. These unique injunctive norms held by student-athletes are worth investigating, as injunctive norms can be powerful predictors of personal substance use specific to student-athletes. Studies on student-athlete injunctive norms are few (Hummer, LaBrie, & Lac, 2009; Lewis, 2008; Mastroleo, Marzell, Turrisi, & Borsari, 2012) compared to the far majority of studies focused on descriptive norms held by student-athletes regarding substance use.

Since research clearly indicates that injunctive norms are strong predictors of substance use (Agostinelli et al., 2003; Borsari & Carey, 2001; Borsari & Carey, 2003; Larimer, Turner, Mallett, & Geisner, 2004; Patrick, Neighbors, & Lee, 2012; Perkins & Craig, 2006; Neighbors, O'Connor, Lewis, Chawla, Lee, & Fossos, 2008), it is imperative that more studies be conducted on student-athlete injunctive norms so that the research can inform behavioral interventions.

## CHAPTER III

### METHODS

#### **Research Question #1**

There are several unique and understudied injunctive reference groups that are specific to college student-athletes. I addressed these norms by answering my first research question, “Do student-athlete perceptions of teammate and coach approval of substance use predict student-athlete substance use?” This question was answered through a statistical analysis of an existing data set regarding student-athlete substance use behaviors and social norms.

#### **Hypothesis**

Based on previous research, my hypothesis to Research Question #1 was that student-athlete injunctive norms held towards teammates would predict personal use and injunctive norms held towards coaches would not predict personal use. Although no previous studies have considered injunctive norms held towards teammates and coaches together, my hypothesis was drawn from previous studies that have examined injunctive norms held towards peers and parents. These studies suggested that injunctive norms held towards peers are a stronger influence towards drinking when compared to those held towards parents (Cail & LaBrie, 2010; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Neighbors, O'Connor, Lewis, Chawla, Lee, & Fossos, 2008). Since coaches often play a mentor or “surrogate parent” role in the lives of student-athletes (Mastroleo, Marzell,

Turrisi, & Borsari, 2012; Short & Short, 2005), it seemed likely that injunctive norms held towards coaches would be similar in regard to norms held about parents.

## **Participants**

### *Recruitment*

Following IRB approval, college student-athletes were recruited during the Spring semester of 2012 from 54 NCAA colleges and universities. Schools were equally divided across competitive play (Divisions I, II, and III) and from each region of the United States (Table 2). Each school was invited to participate in the study with an incentive of receiving a free year's subscription to a web-based alcohol and other drug (AOD) prevention program (myPlaybook). Participating schools asked their incoming student-athletes (e.g., freshman and transfer students) to complete the study's online survey, which students completed immediately prior to participating in the myPlaybook curriculum. Participants were excluded from this study if they were 21 years of age or older and if they were not in their first year of athletic eligibility. Student-athletes were not offered an incentive to participate in the study.

### *Demographics*

A total of 3,291 student-athletes completed the study's survey. The demographics of the sample reflected that of first-year NCAA student-athletes across the country (NCAA, 2012). The majority of student-athletes identified themselves as White (74%) or Black (11.4%) and 18 (51.6%) or 19 (44.7%) years old. Half of the student-athletes were

male (50.1%). Just over half (55.8%) were in-season during the time of the pre-test survey (Table 3).

## **Measures**

### *Instrument*

Survey items regarding personal substance use were slightly modified from the NCAA's National Study of Substance Use Trends among NCAA College Student-Athletes (NCAA, 2012). Items on injunctive norms were pilot tested by Prevention Strategies during previous research studies (Appendix A).

### *Independent Variables*

Injunctive norms were measured by asking participants how their teammates and coaches would feel about the participant getting drunk frequently, using tobacco, and using marijuana. Specifically, participants were asked, "How would the following groups of people (Teammates/Coaches) feel about you (getting drunk frequently, using marijuana, using tobacco)?" Participants ranked their perceived acceptability on a 5-point Likert-scale (Strongly Disapprove, Somewhat Disapprove, Neither Approve nor Disapprove, Somewhat Approve, Strongly Approve) (Appendix A). Injunctive norms were separated into two measures: Injunctive norms of drunkenness and injunctive norms of a substance use. Injunctive norms of substance use was made into a composite using two items about perceived acceptability of the participant using tobacco and using marijuana. A correlation of .50 was found for the two items regarding the teammate

reference group and a correlation of .34 was found for the two items regarding the coach reference group.

#### *Dependent variables*

Drunkenness was measured as a discrete variable on a 0 to 30 scale through the survey item, “During the past 30-days, on how many days did you get drunk?” The composite score measured past 30-day substance use of cigarettes, smokeless tobacco (e.g., chewing tobacco, snuff, dip, or snus), and marijuana. Survey items measured past 30-day use on a 6-point scale (none, once, twice, 3-5 days, 6-9 days, 10 or more days) (Appendix A).

#### **Plan of Analysis**

Multi-level modeling was used to control for the nesting of student-athletes in different schools. The multi-level model included two levels: The first at the individual level (sex, race/ethnicity, age, seasonal status) and the second at the level of competitive play (Division I, II, III).

To test injunctive reference group prediction of personal substance use, a regression analysis was performed on each reference group and its related substance use behavior. Each regression included three models, with the first containing the teammate reference group, the second containing the coach reference group, and the third including both reference groups. The three models were conducted to tease apart each groups’ contribution to substance use behaviors and determine the unique effect of each group after controlling for the other group within the same model. Each model controlled for

variables that have been shown to be associated with student-athlete substance use, including sex, race/ethnicity, age, seasonal status (e.g., in-season, off-season), and level of competitive play (Division I, II, III) (see Chapter II subsections: Season, Division, and Sport Aspects of Student-Athlete Substance Use, Sex and Race/Ethnic Aspects of Student-Athlete Substance Use) (Cadigan, Littlefield, Martens, & Sher, 2013; Martens, Dams-O'Connor, & Duffy-Paiement, 2006; NCAA, 2012; Thombs, 2000; Wechsler et al., 1997; Yusko et al., 2008). Dummy codes were used in order to include categorical control variables in the regression models, including sex (reference group = female), race/ethnicity (reference group = White), season (reference group = out-of-season), and Division (reference group = Division I).

### **Limitations**

The design of this study has several limitations. First, the results came from a convenience sample that is not representative of all student-athletes in the nation during the study's timeframe. As such, the study's results could not be generalized to all student-athletes. Second, the study's design was cross-sectional, meaning that results from this study would only represent participant behaviors and perceptions at a single snapshot in time, which allow for making inferences about associations between variables and not about aspects of time-order (e.g., norms impacting behavior or behavior impacting norms). Finally, this study only included first year students. One longitudinal research study suggests that alcohol use increases as student-athletes progress from their first-year in college to their fourth-year (Cadigan, Littlefield, Martens, & Sher, 2013). Therefore,

the current study was limited in that it may have not represented higher drinking rates that have been self-reported by older student-athletes.

Table 2. Demographic information of participating schools

School Demographics	Number	%
Division		
I	17	31.5
II	21	38.9
III	16	29.6
Region		
South	17	31.5
Northeast	11	20.4
Midwest	16	29.6
West	10	18.5

Table 3. Demographic information of participants

Demographics	<i>n</i>	%
Sex		
Male	1647	50.1
Female	1640	49.9
Age		
17	2	<1
18	1699	51.6
19	1472	44.7
20	118	3.6
Race/Ethnicity		
White or Caucasian	2436	74.0
Black or African American	375	11.4
Hispanic or Latino	116	3.5
Other	364	11.1
Seasonal Status		
In-season	1834	55.7
Off-season	1454	44.2

## **Research Question #2**

To address the mixed findings on student-athlete descriptive norms on proximal-distal reference groups, I answered my second research question, “Do student-athlete perceptions of substance use by proximal and distal reference groups predict student-athlete substance use?” This question was answered through a statistical analysis of an existing data set regarding student-athlete substance use behaviors and social norms.

## **Hypothesis**

Based on previous research involving Social Norms Theory, the hypothesis to Research Question #2 was that descriptive norms held towards close friends would predict personal substance use and that the student-athletes reference group would not predict substance use. Although there have mixed findings on the relationship between proximal-distal reference groups on personal substance use of student-athletes (Doumas, Haustveit, & Coll, 2010; Dams-O'Connor, Martin, & Martens, 2007; Grossbard, Geisner, Mastroleo, Kilmer, Turrisi, & Larimer, 2009; Thombs, 2000; Thombs & Hamilton, 2002), studies on non-athlete college students have consistently shown that norms held toward proximal groups are better predictors of substance use than norms held toward distal groups (Agostinelli et al., 2003; Borsari & Carey, 2003; Carey, Borsari, Carey, & Maisto, 2006; Larimer et al., 2009; Martens, Dams-O'Connor, Duffy-Paiement, & Gibson, 2006).

## **Participants**

### *Recruitment*

Following IRB approval, college student-athletes were recruited during the 2010-11 academic year from 32 NCAA colleges and universities. Each school was invited to participate in the study with an incentive of receiving a free year's subscription to a web-based alcohol and other drug (AOD) prevention program (myPlaybook). Participating schools asked their incoming student-athletes (e.g., freshman and transfer students) to complete the study's online survey, which students completed immediately prior to participating in the myPlaybook curriculum. Schools were divided across competitive play (Divisions I, II, and III) and from each region of the United States (Table 5, Table 6). Student-athletes were not offered an incentive to participate in the study.

### *Demographics*

A total of 3,347 student-athletes completed the study's survey. The majority of student-athletes identified themselves as White (79.3%) or Black (12.9%) and either 18 (39.8%) or 19 (26.4%) years old. Half of the student-athletes were male (50.8%) and half female (49.2%). Just over half (53.7%) were in-season during the time of the pre-test survey (Table 5, Table 6).

## **Measures**

### *Instrument*

Survey items from myPlaybook regarding personal substance use were slightly modified from the NCAA's National Study of Substance Use Trends among NCAA

College Student-Athletes (NCAA, 2012). Items on descriptive norms were pilot tested by Prevention Strategies during previous research studies (Appendix B).

### *Independent Variables*

To measure the descriptive norms, participants were asked what percentage (0 to 100%) of close friends and college athletes used a variety of substances, including heavy episodic drinking, using smokeless tobacco, smoking cigarettes, and smoking marijuana (Appendix B). Descriptive norms were separated into two measures: Descriptive norms of heavy episodic drinking and descriptive norms of a substance use composite. The composite was created using the survey items about perceived student-athlete and close friend use of smokeless tobacco, cigarettes, and marijuana. A reliability of  $\alpha = .79$  was found for the student-athlete norm substance use composite score and  $\alpha = .72$  for the close friend norm substance use composite score.

### *Dependent variables*

Heavy episodic drinking was measured by past 2-week heavy episodic drinking on a 6-point scale (none, once, twice, 3-5 times, 6-9 times, 10 or more times). Past 30-day use of cigarettes was measured on a 7-point scale (none, less than 1 cigarette a day, 1-5 cigarettes a day, 1/2 pack a day, 1 pack a day, 1 and 1/2 pack a day, 2 or more packs a day). Past 30-day use of smokeless tobacco (e.g., chewing tobacco, snuff, dip, or snus) was measured on a 6-point scale (none, once, twice, 3-5 times, 6-9 times, 10 or more times). Past 30-day use of marijuana was measured from 0 to 30 in the survey item: “During the past 30-days, on how many different occasions have you used marijuana or

hashish?” (Appendix B). A composite score was calculated from the measures of smokeless tobacco, cigarettes, and marijuana by standardizing the measures (z-scores) and by calculating the average of the measures for each participant.

### **Plan of Analysis**

Multi-level modeling was used to control for the nesting of student-athletes in different schools. The multi-level model included two levels: the first at the individual level (sex, race/ethnicity, age, seasonal status) and the second at the level of competitive play (Division I, II, III).

To test reference group prediction of personal substance use, a regression analysis was performed on heavy episodic drinking self-report and norms as well as on the substance use composite self-report and norms. Each regression included three models, with the first containing the distal reference group, the second containing the proximal reference group, and the third including both reference groups. The three models were conducted to tease apart each groups’ contribution to substance use behaviors and determine the unique effect of each group after controlling for the other group within the same model. Each model controlled for variables that have been shown to be associated with student-athlete substance use, including sex, race/ethnicity, age, seasonal status (e.g., in-season, off-season), and level of competitive play (Division I, II, III) (see Chapter II subsections: Season, Division, and Sport Aspects of Student-Athlete Substance Use, Sex and Race/Ethnic Aspects of Student-Athlete Substance Use) (Cadigan, Littlefield, Martens, & Sher, 2013; Martens, Dams-O’Connor, & Duffy-Paiement, 2006; NCAA,

2012; Thombs, 2000; Wechsler et al., 1997; Yusko et al., 2008). Dummy codes were used in order to include categorical control variables in the regression models, including sex (reference group = female), race/ethnicity (reference group = White), season (reference group = out-of-season), and Division (reference group = Division I).

### **Limitations**

This study shared the limitations discussed for Research Question #1. The design of this study has several limitations. First, the results came from a convenience sample that is not representative of all student-athletes in the nation during the study's timeframe. As such, the study's results could not be generalized to all student-athletes. Second, the study's design was cross-sectional, meaning that results from this study would only represent participant behaviors and perceptions at a single snapshot in time, which allow for making inferences about associations between variables and conclusions about time-order (e.g., norms impacting behavior or behavior impacting norms). Finally, this study had a large number of first year students. One longitudinal research study suggested that alcohol use increases as student-athletes progress from their first-year in college to their fourth-year (Cadigan, Littlefield, Martens, & Sher, 2013). Therefore, the current study was limited in that it may not have represented higher drinking rates that have been self-reported by older student-athletes.

Table 4. Demographic information of participants

Demographics	<i>n</i>	%
Sex		
Male	1376	50.8
Female	1332	49.2
Age		
17	16	<1
18	1083	39.8
19	718	26.4
20	453	16.6
21	311	11.4
22+	140	4.1
Race/Ethnicity		
White or Caucasian	2106	79.3
Black or African American	342	12.9
Hispanic or Latino	109	3.3
Other	790	4.5
Season		
In-season	1438	53.7
Out-of-season	1241	46.3
Division		
I	1879	70.2
II	521	19.5
III	276	10.3
Region		
South	996	29.8
Midwest	724	21.6
Northeast	1026	30.7
West	601	17.9

CHAPTER IV  
THE ROLE OF COACH AND TEAMMATE INJUNCTIVE NORM REFERENCE  
GROUPS ON COLLEGE STUDENT-ATHLETE SUBSTANCE USE

College student-athletes are at risk for using a variety of substances, especially alcohol, tobacco, and marijuana (Doumas, Turrisi, Coll, & Haralson, 2007; Ford, 2007; Nelson & Wechsler, 2001; Wechsler, Davenport, Dowdall, Grossman, & Zanakos, 1997; Campos, Yonamine, & de Moraes Moreau, 2003; NCAA, 2012). As such, experts recommend that college administrators make every effort to prevent substance use among student-athletes (Martens, Dams-O'Connor, & Beck, 2006; Turrisi, Mallett, Mastroleo, & Larimer, 2006). One effort that has shown evidence in preventing substance use among student-athletes is intervention rooted in the Social Norms Theory (Doumas & Haustveit, 2008; Doumas, Haustveit, & Coll, 2010; LaBrie, Hummer, Grant, & Lac, 2010; Perkins & Craig, 2006).

According to the Social Norms Theory, individuals often erroneously perceive that a larger portion of others engage in and approve of problem behaviors than actually do. This misperception may motivate individuals to increase their own problem behaviors in order to fit their view of normal behavior. Social Norms Theory also argues that when misperceptions regarding the problem behaviors of others are corrected, people will tend to change their own behaviors (Berkowitz, 2005; Perkins, 2002a; Perkins, 2003).

Researchers suggest that people have two types of perceptions regarding problem behaviors, known as descriptive norms and injunctive norms. Descriptive norms refer to the perception of the prevalence of others' behaviors (e.g., the perception of how many of one's peers smoke marijuana), while injunctive norms refer to the perception of other's acceptability of a behavior (e.g., the perception that others' think it is acceptable to use marijuana) (Borsari & Carey, 2003; Cialdini, Kallgren, & Reno, 1990; Perkins, 2002a). Injunctive norms, also known as subjective norms, have been used as a construct in other theories (i.e., Theory of Reasoned Action, Theory of Planned Behavior, Integrated Behavior Model) to help explain behavior, in that one's behavioral intentions are affected by their perception of others' acceptability of a certain behavior (Ajzen, 1991; Fishbein & Ajzen, 1975; Montaña & Kasprzyk, 2008). Several research studies in the area of substance use have reflected Social Norms Theory regarding injunctive norms, in that people tend to overestimate others' acceptability of substance use (Agostinelli, Grube, & Morgan, 2003; Alva, 1998; Baer, 1994; Barnett, Far, Mauss, & Miller, 1996; Carey, Borsari, Carey, & Maisto, 2006; Prentice & Miller, 1993; Schroeder & Prentice, 1998) and that those perceptions are related to one's personal substance use (Borsari & Carey, 2001; Borsari & Carey, 2003; Larimer, Turner, Mallett, & Geisner, 2004; Perkins & Wechsler, 1996).

Although Social Norms Theory suggests that people overestimate others' problem behaviors, the theory does not specify who the "others" are (Berkowitz, 2005). Within the literature, research studies vary in how participants are surveyed regarding their

perceptions about “others,” also known as reference groups. Currently, substance use research on injunctive norms has measured people’s perceptions of substance use acceptability from various reference groups, including entire communities (Song, Smiler, Wagoner, & Wolfson, 2012), parents (Lo, 1995; SAMHSA, 2011), typical college students (Park, Klein, Smith, & Martell, 2009), typical college athletes (Hummer, LaBrie, & Lac, 2009), high school coaches (Mastroleo, Marzell, Turrisi, & Borsari, 2012), fraternity/sorority members (Larimer, Turner, Mallett, & Geisner, 2004), resident assistants (Perkins, 2002a), and close friends (Patrick, Neighbors, & Lee, 2012). Research shows that participants tend to hold different injunctive norms towards different reference groups (Agostinelli et al., 2003; Neighbors et al., 2008; Patrick et al., 2012). For instance, Agostinelli and colleagues asked over 2,500 high school students to rank their perceived disapproval of drinking of various reference groups. Participants perceived that their best friends or other close friends had stronger feelings of disapproval towards alcohol use than students at their school and other schools (Agostinelli et al., 2003).

Research on injunctive norms held by student-athletes is limited. To the authors’ knowledge, only two studies have examined student-athlete perceptions of others approval of substance use. One study tested injunctive norms held towards a “typical athlete” reference group and found that the norms were a strong predictor for personal attitudes towards drinking (Hummer et al., 2009). The other study was a multiple discriminant function analysis that tested which of 15 different variables classified student-athletes as binge drinkers or non-binge drinkers. The study found that only a few

the variables were associated with binge drinking, including one's perceptions of their coaches' attitudes towards alcohol use (Lewis, 2008).

The purpose of the current study was to extend research on injunctive norms held by student-athletes. Specifically, this research was designed to test multiple reference groups' ability to predict personal substance use. Understanding which reference groups predict substance use could help health professionals improve social norms interventions by framing the interventions around meaningful reference groups in regards to student-athletes. Therefore, this study was conducted to answer the following research question: Do student-athlete perceptions of teammate and coach approval of substance use predict student-athlete substance use? The authors' hypothesized that student-athlete injunctive norms held towards teammates would be a better predictor of personal use when compared to injunctive norms held towards coaches. Although no previous studies have compared injunctive norms of teammates and coaches, the hypothesis was drawn from previous studies that examined college student injunctive norms held towards peers and parents. These studies suggested that injunctive norms held towards peers are a stronger influence towards drinking when compared to those held towards parents (Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Neighbors et al., 2008; Cail & LaBrie, 2010). Since coaches often play a mentor or "surrogate parent" role in the lives of student-athletes (Mastroleo et al., 2012; Short & Short, 2005), we hypothesized that injunctive norms held towards coaches would be similar in regard to norms held about parents.

## **Methods**

### *Recruitment*

Following IRB approval, college student-athletes were recruited during the Spring semester of 2012 from 54 NCAA colleges and universities. Schools were equally divided across competitive play (Divisions I, II, and III) and from each region of the United States (Table 7). Each school was invited to participate in the study with an incentive of receiving a free year's subscription to a web-based alcohol and other drug (AOD) prevention program (myPlaybook). Participating schools asked their incoming student-athletes (e.g., freshman and transfer students) to complete the study's online survey, which students completed immediately prior to participating in the myPlaybook curriculum. Participants were excluded from this study if they were 21 years of age or older and if they were not in their first year of athletic eligibility. Student-athletes were not offered an incentive to participate in the study.

### *Measures – Injunctive Norms*

Injunctive norms were measured by asking participants how their teammates and coaches would feel about the participant getting drunk frequently, using tobacco, and using marijuana. Specifically, participants were asked, "How would the following groups of people (Teammates/Coaches) feel about you (getting drunk frequently, using marijuana, using tobacco)?" Participants ranked their perceived acceptability on a 5-point Likert-scale (Strongly Disapprove, Somewhat Disapprove, Neither Approve nor Disapprove, Somewhat Approve, Strongly Approve). Injunctive norms were separated

into two measures: Injunctive norms of drunkenness and injunctive norms of a substance use. Injunctive norms of substance use was made into a composite using two items about perceived acceptability of the participant using tobacco and using marijuana. A correlation of .50 was found for the two items regarding the teammate reference group and a correlation of .34 was found for the two items regarding the coach reference group.

#### *Measures – Substance Use*

Drunkenness was measured as a discrete variable on a 0 to 30 scale through the survey item, “During the past 30-days, on how many days did you get drunk?” The composite score measured past 30-day substance use of cigarettes, smokeless tobacco (e.g., chewing tobacco, snuff, dip, or snus), and marijuana. Survey items measured past 30-day use on a 6-point scale (none, once, twice, 3-5 days, 6-9 days, 10 or more days).

#### *Plan of Analysis*

Multi-level modeling was used to control for the nesting of student-athletes in different divisions. The multi-level model included two levels: The first at the individual level (sex, race/ethnicity, age, seasonal status) and the second at the level of competitive play (Division I, II, III).

To test injunctive reference group prediction of personal substance use, a regression analysis was performed on each reference group and its related substance use behavior. Each regression included three models, with the first containing the teammate reference group, the second containing the coach reference group, and the third including both reference groups. The three models were conducted to tease apart each groups’

contribution to substance use behaviors and determine the unique effect of each group after controlling for the other group within the same model. Each model controlled for variables that have been shown to be associated with student-athlete substance use, including sex, race/ethnicity, age, seasonal status (e.g., in-season, off-season), and level of competitive play (Division I, II, III) (Cadigan, Littlefield, Martens, & Sher, 2013; Martens, Dams-O'Connor, & Duffy-Paiement, 2006; NCAA, 2012; Thombs, 2000; Wechsler et al., 1997; Yusko et al., 2008). Dummy codes were used in order to include categorical control variables in the regression models, including sex (reference group = female), race/ethnicity (reference group = White), season (reference group = out-of-season), and Division (reference group = Division I).

## **Results**

### *Demographics*

A total of 3,291 student-athletes completed the study's survey. The demographics of the sample reflect that of first-year NCAA student-athletes across the country (NCAA 2012). The majority of student-athletes identified themselves as White (74%) or Black (11.4%) and 18 (51.6%) or 19 (44.7%) years old. Half of the student-athletes were male (50.1%) and half female (49.9%). Just over half (55.8%) were in-season during the time of the pre-test survey (Table 8).

### *Difference in Norms*

There was a significant difference of injunctive norms held towards teammates and coaches in terms of getting drunk frequently,  $t(3243) = 35.93, p < .05$ , with

participants perceiving greater approval from teammates ( $M = 1.72, SD = 0.97$ ) as compared to coaches ( $M = 1.15, SD = 0.49$ ). There was a similar difference in injunctive norms regarding the substance use composite,  $t(3227) = 33.68, p < .05$ , with participants perceiving greater approval from teammates ( $M = 1.59, SD = 0.78$ ) as compared to coaches ( $M = 1.22, SD = 0.46$ ).

#### *Multilevel Models – Drunkenness*

The intraclass correlation (ICC) indicated that 5.7% of the variance of student-athlete drunkenness was due to variance across divisions. Three models were used to analyze how injunctive norms held towards teammates and coaches predict personal drunkenness (Table 9). In Model 1, norms held toward teammates were positively associated with past 30-day drunkenness ( $\beta = .69, p < .05$ ). Likewise, norms held towards coaches were positively associated with past 30-day drunkenness in Model 2 ( $\beta = .76, p < .05$ ). Contrary to our hypothesis, when both norms were included in Model 3, the teammate ( $\beta = .63, p < .05$ ) and coach reference groups ( $\beta = .33, p < .05$ ) both independently predicted past 30-day drunkenness.

#### *Multilevel Models – Substance Use Composite*

The ICC indicated that 1.7% of the variance of student-athlete substance use was due to variance across divisions. Three models were used to analyze how injunctive norms held towards teammates and coaches predict personal substance use (Table 10). In Model 1, norms held towards teammates were positively associated with past 30-day substance use ( $\beta = .20, p < .05$ ). Likewise, norms held toward coaches were positively

associated with substance use in Model 2 ( $\beta = .31, p < .05$ ). Contrary to our hypothesis, when norms held towards teammates and coaches were included in Model 3, both teammate ( $\beta = .15, p < .05$ ) and coach reference groups ( $\beta = .17, p < .05$ ) both independently predicted past 30-day substance use.

## **Discussion**

Although previous studies assessed the association of injunctive norms and substance use of student-athletes, research had yet to investigate injunctive norms held towards teammates or compare more than one injunctive norm reference group in the same study. By knowing which reference groups predict substance use, social norms interventions can be informed by research and framed around meaningful reference groups. To address this gap in the literature, injunctive norms held towards unique, relevant reference groups of student-athletes were examined using multi-level models that controlled for factors known to contribute to substance use of student-athletes (e.g., sex, race/ethnicity, seasonal status, division). Specifically, we tested the ability of teammate and coach injunctive norm reference groups to predict self-reported substance use of student-athletes.

This study supported past research regarding how perceptions of others' approval of substance use varies with different reference groups (Agostinelli et al., 2003; Neighbors et al., 2008; Patrick et al., 2012). Our findings indicated that student-athletes perceived that their teammates were more approving of drunkenness and substance use when compared to their coaches. This finding was logical, considering student-athletes

probably socialize and use substances with teammates more often than they might do with coaches.

The findings from this study also reflected a major assumption of the Social Norms Theory, in that the perception of others' approval of substance use is associated with personal behavior (Berkowitz, 2005). Based on past research comparing peer and parent norms, we hypothesized that participant perception of coach approval would be less predictive of substance use than the perception of teammate approval (Cail & LaBrie, 2010; Neighbors et al., 2007, Neighbors et al., 2008). However, after controlling for several key factors related to substance use among student-athletes, injunctive norms held towards both teammates and coaches predicted self-reported drunkenness and substance use behaviors. An explanation for injunctive norms held towards coaches acting as a predictor may be team substance use policies that are created and enforced by coaches. It is possible that by setting formal policies about substance use and outlining the consequences for breaking those policies (e.g., not participating in practice or competition), coaches may instill an awareness and belief in their student-athletes that substance use is a serious issue and are a real threat to interfering with participating in college sports.

#### *Implications for Practice and Research*

The study's findings have practical implications for future social norms interventions. Those considering implementing a social norms intervention among college student-athletes may want to frame the intervention around injunctive norms held

towards both teammates and coaches. Framing an intervention around a teammate reference group may be conducted best through a team-wide intervention, in which an entire team would be surveyed and informed about perceptions and actual substance use behaviors of teammates. Framing an intervention around a coach reference group might involve training coaches how to effectively communicate their views towards substance use with their student-athletes. This might also include working closely with coaches during an intervention by surveying their opinions towards substance use and sharing the results with the student-athletes.

This study also has important implications for future research. Although teammates and coaches are relevant reference groups to student-athletes, there are still other groups of people whose opinion may be important to substance use behaviors of student-athletes, such as athletic trainers (Burns, Schiller, Merrick, & Wolf, 2004), team captains (Thombs & Hamilton, 2002), and parents (Turrisi, Mastroleo, Mallett, Larimer, & Kilmer, 2007). Future studies should compare these multiple reference groups to determine the independent contribution of each group. By doing so, researchers and health professionals can gain an understanding of which reference groups to target when creating and implementing social norms interventions for student-athletes.

This study focused exclusively on student-athletes who were 20 years old or younger. It is possible that perceptions of teammate and coach approval may be different among older student-athletes. Future research should investigate how older student-

athletes perceive teammate and coach approval and how those perceptions related to personal substance use behaviors.

The findings from this study suggest that the perception of approval from one's coach may influence substance use behaviors. Future studies may want to investigate what aspects of coach behavior affect student-athlete perceptions of their coaches' approval for substance use. Past research indicates that a coach's substance use policies may impact student-athlete perceptions; however, the authors believe that other factors may also affect perceptions about substance use, including how often coaches talk about substances, coaches' own use of substances, and coaches' compliance with NCAA regulations. Determining which aspects of coach behavior impact perceptions held by student-athletes would inform injunctive norm interventions that focus on training coaches how to decrease student-athlete substance use.

Our study also has an implication for future research in terms of expanding studies on student-athlete injunctive norms outside of alcohol use. Previous studies on student-athlete injunctive norms have only examined perceptions of drinking (Hummer et al., 2009; Lewis, 2008). Understanding how student-athletes perceive others' approval of a wide variety of substances is important for creating effective, targeted prevention programming towards this population. As mentioned previously, student-athletes are also at high risk for other substances, including tobacco and marijuana use (Campos et al., 2003; NCAA, 2012; Yusko et al., 2008).

### *Limitations*

This study's findings should be read with caution due to several methodological limitations. First, the sample was not randomly selected, which limited the study's generalizability; however, the sample was representative of the nation's college student-athletes in terms of demographics and levels of competitive play (NCAA, 2012). Second, the study's design was cross-sectional, meaning that results from this study would only represent participant behaviors and perceptions at a single snapshot in time, which allows for making inferences about associations between variables but not about aspects of time-order (e.g., norms impacting behavior or behavior impacting norms). Finally, this study only included first year students. One longitudinal research study suggests that alcohol use increases as student-athletes progress from their first-year in college to their fourth-year (Cadigan, Littlefield, Martens, & Sher, 2013). Therefore, the current study was limited in that it may have not represented higher drinking rates that have been self-reported by older student-athletes.

### **Conclusion**

Despite its methodological limitations, this study contributed to the literature by comparing the ability of injunctive norm reference groups unique to college student-athletes to predict personal substance use. Although student-athletes perceived that teammates have a greater approval of drunkenness and substance use when compared to coaches, both teammate and coach reference groups independently predicted these behaviors. A possible explanation of the coach reference group acting as a predictor of

use may be a coach's role in forming team dynamics through recruitment, relationship, and policy formation. These findings have important implications for future research, such as considering several reference groups important to the lives of student-athletes (e.g., team captains, athletic trainers) that remain unstudied within injunctive norm research and considering substances other than alcohol for norms research, as tobacco and marijuana are also substances of concern among the student-athlete population.

Table 5. Demographic information of participating schools

School Demographics	<i>n</i>	%
Division		
I	17	31.5
II	21	38.9
III	16	29.6
Region		
South	17	31.5
Northeast	11	20.4
Midwest	16	29.6
West	10	18.5

Table 6. Demographic information of participants

Demographics	<i>n</i>	%
Sex		
Male	1647	50.1
Female	1640	49.9
Age		
17	2	<1
18	1699	51.6
19	1472	44.7
20	118	3.6
Race/Ethnicity		
White or Caucasian	2436	74.0
Black or African American	375	11.4
Hispanic or Latino	116	3.5
Other	364	11.1
Seasonal Status		
In-season	1834	55.7
Off-season	1454	44.2

Table 7. Multilevel model regression results for past 30-day drunkenness as a function of demographics and injunctive norms towards teammates and coaches

Predictor	Model 1	Model 2	Model 3
Intercept	0.18 (0.29)	0.70* (0.31)	-0.08 (0.30)
Level 1			
Teammate Norms	0.69* (0.05)		0.63* (0.05)
Coach Norms		0.76* (0.10)	0.33* (0.10)
Male	0.36* (0.10)	0.44* (0.10)	0.35* (0.10)
Age	-0.03 (0.09)	-0.08 (0.09)	-0.03 (0.09)
Black	-0.35 (0.19)	-0.47* (0.19)	-0.34 (0.19)
Hispanic	-0.33 (0.31)	-0.32 (0.32)	-0.31 (0.31)
Other	-0.39* (0.17)	-0.47* (0.17)	-0.40* (0.17)
Season	-0.40* (0.10)	-0.52* (0.10)	-0.41* (0.10)
Level 2			
Division II	-0.08 (0.22)	-0.11 (0.23)	-0.08 (0.22)
Division III	0.19 (0.22)	0.30 (0.23)	0.21 (0.22)

*Note.* Standard errors are in parenthesis. \* $p < .05$ . Reference groups for sex = female, race/ethnicity = White, season = out-of-season, Division = Division I.

Table 8. Multilevel model regression results for past 30-day substance use as a function of demographics and injunctive norms towards teammates and coaches

Predictor	Model 1	Model 2	Model 3
Intercept	-0.33* (0.06)	-0.38* (0.06)	-0.45* (0.06)
Level 1			
Teammate Norms	0.20* (0.01)		0.15* (0.02)
Coach Norms		0.31* (0.03)	0.17* (0.03)
Male	0.11* (0.02)	0.13* (0.02)	0.09* (0.02)
Age	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)
Black	-0.11* (0.04)	-0.12* (0.04)	-0.10* (0.04)
Hispanic	-0.12* (0.06)	-0.12* (0.06)	-0.11 (0.06)
Other	-0.09* (0.04)	-0.09* (0.04)	-0.09* (0.04)
Season	-0.03 (0.02)	-0.04 (0.02)	-0.03 (0.02)
Level 2			
Division II	-0.01 (0.03)	-0.02 (0.03)	-0.01 (0.03)
Division III	0.01 (0.04)	0.04 (0.04)	0.02 (0.03)

*Note.* Standard errors are in parenthesis. \* $p < .05$ . Reference groups for sex = female, race/ethnicity = White, season = out-of-season, Division = Division I.

CHAPTER V  
THE ROLE OF PROXIMAL-DISTAL DESCRIPTIVE NORM REFERENCE GROUPS  
ON COLLEGE STUDENT-ATHLETE SUBSTANCE USE

Student-athletes have a high prevalence of substance use, particularly of alcohol, tobacco, and marijuana (Doumas, Turrisi, Coll, & Haralson, 2007; Ford, 2007; Nelson & Wechsler, 2001; Wechsler, Davenport, Dowdall, Grossman, & Zanakos, 1997; Campos, Yonamine, & de Moraes Moreau, 2003; NCAA, 2012). In response, experts in the field have recommended that college leaders focus prevention efforts towards the student-athlete population (Martens, Dams-O'Connor, & Beck, 2006; Turrisi, Mallett, Mastroleo, & Larimer, 2006). An approach that has shown some promise in preventing substance use among student-athletes is interventions based upon Social Norms Theory (Doumas & Haustveit, 2008; Doumas, Haustveit, & Coll, 2010; LaBrie, Hummer, Grant, & Lac, 2010; Perkins & Craig, 2006).

According to Social Norms Theory, individuals often have exaggerated perceptions of the number of others who engage in problem behaviors. These perceptions, also known as descriptive norms, are well documented in literature. For instance, of the 100,000 college students who completed the National College Health Assessment in 2012, 80% perceived that the typical college student currently smoke cigarettes, when in reality only about 14% of college students who completed the survey reported being current smokers. This overestimation was similar for past 30-day use of

other substances as well, such as marijuana (82% perceived use vs. 16% actual use), hookah (68% perceived use vs. 8% actual use), and cocaine (33% perceived use vs. 1% actual use) (ACHA, 2012). Research studies have consistently shown that descriptive norms are a strong predictor of personal substance use behaviors, with higher perceptions being associated with higher rates of personal consumption (Borsari & Carey, 2001; Martens, Dams-O'Connor, Duffy-Paiement, & Gibson, 2006; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Perkins, Haines, & Rice, 2005; Perkins & Wechsler, 1996).

Although Social Norms Theory suggests that people overestimate others' use of substances, the theory does not specify who the "others" are (Berkowitz, 2005). Within the literature, research studies vary in how participants are surveyed regarding their perceptions about "others," also known as reference groups. For instance, the 2012 NCHA (ACHA, 2012) asked participants, "Within the last thirty days, how often do you think the typical student at your school used marijuana?" In this particular survey item, the reference group that participants were asked to estimate substance use of was "the typical student at your school." Other research projects have used even broader, or distal, reference groups in relation to participants, such as "typical college student" (Borsari & Carey, 2000) or "most students" (Haines, 1996), which imply the average college student from the entire nation as opposed to the average student attending a particular college. On the other hand, some studies have used survey items that refer to groups of people that are more relevant, or proximal, to the participants' lives. For example, studies have asked for participants' perceptions of substance use from their "best friend" (Baer & Carney, 1993)

or “closest friends” (Lee, Geisner, Lewis, Neighbors, & Larimer, 2007). Proximal reference groups have also been used in Social Norms Theory research on certain subpopulations, such as using a “Greek men” reference group for studies regarding fraternity members (Carter & Kahnweiler, 2000) and a “typical teammate” reference group for studies with a focus on student-athletes (Thombs, 2000).

Proximal and distal reference groups are an important issue in Social Norms Theory. Research studies indicate that participants often have varying perceptions of different reference groups used in survey items. Typically, participants perceive that distal reference groups consume substances more so than proximal reference groups (Agostinelli, Grube, & Morgan, 2003; Borsari & Carey, 2003; Carey, Borsari, Carey, & Maisto, 2006; Larimer et al., 2009; Martens, Dams-O'Connor, Duffy-Paiement, & Gibson, 2006). Different social theories (e.g., Social Identification Theory, Social Comparison Theory, Social Impact Theory) argue that people identify with groups they belong to and are better able to grasp and evaluate information regarding those groups as compared to groups of people they are unfamiliar with (Festinger, 1954; Hogg & Abrams, 1988; Latane, 1981; Tajfel & Turner, 1986), such as trying to imagine the “typical” college student and their substance use behaviors. Research also indicates that estimations of substance use for proximal reference groups, as compared to distal groups, tend to reflect the participants’ personal substance use behaviors. For instance, researchers in one study asked over 1,000 undergraduate students to estimate descriptive drinking norms of several reference groups ranging in proximity to the participants, including: typical

student, same gender, ethnicity, residence, and various combinations of certain groups. The study's results indicated that participants' perceptions of proximal groups, at any level, was more related to personal drinking behavior as compared to perceptions of more distal groups (Larimer et al., 2009).

Findings have been inconsistent in terms of how student-athletes view relevant proximal and distal reference groups (e.g., typical college athlete, athletes at your university, typical teammate, closest athlete friend, closest non-athlete friend). The findings from one study suggested that perceptions of proximal groups, versus distal, are more strongly associated with personal substance use of student-athletes. In the study, researchers found that student-athlete perceptions of their "closest athlete friend" drinking behaviors had the strongest relationship with personal alcohol use when compared to perceptions of their "closest non-athlete friend" drinking behaviors (Martens, Dams-O'Connor, Duffy-Paiement, & Gibson, 2006). On the other hand, the findings from a different study indicated that perceptions of distal reference group alcohol use may be better predictors of personal alcohol use. Dams-O'Connor, Martin, & Martens (2007) tested descriptive norms of four reference groups (closest athlete friend, closest non-athlete friend, typical athlete, typical non-athlete) and found that perceptions about the typical athlete reference group, more so than closest athlete friend, was the better predictor of personal alcohol use. Yet another research study suggested that proximal and distal descriptive norms are equivalent predictors of student-athlete drinking behaviors. In 2000, Thombs conducted a multiple discriminant function analysis on nearly 300 student-

athletes to assess the ability of norms to discriminate among different drinking patterns. Thombs found that the “typical teammate” and “typical student on campus” reference groups had nearly equal discriminatory power to the study’ function analysis (Thombs, 2000).

The purpose of the current study was to extend research on proximal-distal norms held by student-athletes. Specifically, this research aimed to answer the following research question: Do student-athlete perceptions of substance use by proximal and distal reference groups predict student-athlete substance use? The authors’ hypothesized that the proximal reference group (close friends) would predict substance use and that the distal reference group (college athletes in general) would not predict substance use. Although findings are mixed in terms of the proximal-distal reference group relationship with personal substance use of student-athletes, this hypothesis was drawn from previous studies on non-athlete college students that have shown consistency in proximal reference groups being better predictors of substance use than distal reference groups (Borsari & Carey, 2003; Carey, Borsari, Carey, & Maisto, 2006; Larimer et al., 2009).

## **Methods**

### *Recruitment*

Following IRB approval, college student-athletes were recruited during the 2010-11 academic year from 32 NCAA colleges and universities. Each school was invited to participate in the study with an incentive of receiving a free year’s subscription to a web-based alcohol and other drug (AOD) prevention program (myPlaybook). Participating

schools asked their incoming student-athletes (e.g., freshman and transfer students) to complete the study's online survey, which student-athletes completed immediately prior to participating in the myPlaybook curriculum. Student-athletes attended schools that were divided across competitive play (Divisions I, II, and III) and from each region of the United States (Table 11). Student-athletes were not offered an incentive to participate in the study.

#### *Measures – Descriptive Norms*

To measure the descriptive norms, participants were asked what percentage (0 to 100%) of close friends and college athletes used a variety of substances prior to being surveyed, including heavy episodic drinking, using smokeless tobacco, smoking cigarettes, and smoking marijuana. Descriptive norms were separated into two measures: Descriptive norms of heavy episodic drinking and descriptive norms of a substance use composite. The composite was created using the survey items about perceived student-athlete and close friend use of smokeless tobacco, cigarettes, and marijuana. A reliability of  $\alpha = .79$  was found for the student-athlete norm substance use composite score and  $\alpha = .72$  for the close friend norm substance use composite score.

#### *Measures – Personal Substance Use*

Heavy episodic drinking was measured by past 2-week heavy episodic drinking on a 6-point scale (none, once, twice, 3-5 times, 6-9 times, 10 or more times). Past 30-day use of cigarettes was measured on a 7-point scale (none, less than 1 cigarette a day, 1-5 cigarettes a day, 1/2 pack a day, 1 pack a day, 1 and 1/2 pack a day, 2 or more packs a

day). Past 30-day use of smokeless tobacco (e.g., chewing tobacco, snuff, dip, or snus) was measured on a 6-point scale (none, once, twice, 3-5 times, 6-9 times, 10 or more times). Past 30-day use of marijuana was measured from 0 to 30 in the survey item: “During the past 30-days, on how many different occasions have you used marijuana or hashish?” We calculated a composite score of the measures of smokeless tobacco, cigarettes, and marijuana by standardizing the measures (z-scores) and by calculating the average of the measures for each participant.

#### *Plan of Analysis*

Multi-level modeling was used to control for the nesting of student-athletes in different schools. The multi-level model included two levels: the first at the individual level (sex, race/ethnicity, age, seasonal status) and the second at the level of competitive play (Division I, II, III).

To test reference group prediction of personal substance use, a regression analysis was performed on heavy episodic drinking self-report and norms as well as on the substance use composite self-report and norms. Each regression included three models, with the first containing the distal reference group, the second containing the proximal reference group, and the third including both reference groups. The three models were conducted to tease apart each groups’ contribution to substance use behaviors and determine the unique effect of each group after controlling for the other group within the same model. Each model controlled for variables that have been shown to be associated with student-athlete substance use, including sex, race/ethnicity, age, seasonal status (e.g.,

in-season, off-season), and level of competitive play (Division I, II, III) (Cadigan, Littlefield, Martens, & Sher, 2013; Martens, Dams-O'Connor, & Duffy-Paiement, 2006; NCAA, 2012; Thombs, 2000; Wechsler et al., 1997; Yusko et al., 2008). Dummy codes were used in order to include categorical control variables in the regression models, including sex (reference group = female), race/ethnicity (reference group = White), season (reference group = out-of-season), and Division (reference group = Division I).

## **Results**

### *Demographics*

A total of 3,347 student-athletes completed the study's survey. The majority of student-athletes identified themselves as White (79.3%) or Black (12.9%) and either 18 (39.8%) or 19 (26.4%) years old. Half of the student-athletes were male (50.8%). Just over half (53.7%) were in-season during the time of the pre-test survey (Table 11).

### *Difference in Norms*

There was a small, significant difference in descriptive norms held towards college athletes and close friends in terms of heavy episodic drinking,  $t(2588) = 3.7, p < .05$ , with the average perception that 51% of college athletes engaged in heavy episodic drinking ( $SD = 0.97$ ) as compared to 49% of close friends ( $SD = 0.50$ ). There was a significant difference in descriptive norms held towards college athletes and close friends in terms of substance use,  $t(2584) = 33.45, p < .05$ , with the average perception that 27% of college athletes use substances ( $SD = 18.0$ ) as compared to 15% of close friends ( $SD = 18.0$ ).

### *Multilevel Models – Heavy Episodic Drinking*

The intraclass correlation (ICC) indicated that 4.9% of heavy episodic drinking variance was due to variance across schools. Three models were used to analyze how descriptive norms held towards a proximal (close friends) and distal (college athletes) reference group predict personal heavy episodic drinking (Table 12). In Model 1, descriptive norms held towards the distal reference group were positively associated with heavy episodic drinking ( $\beta = .06$ ,  $t(2486) = 8.30$ ,  $p < .05$ ). Likewise, descriptive norms held towards the proximal reference group were positively associated with heavy episodic drinking in Model 2 ( $\beta = .11$ ,  $t(2484) = 21.08$ ,  $p < .05$ ). When proximal and distal reference groups were included in Model 3, only norms held towards the proximal reference group positively predicted heavy episodic drinking ( $\beta = .01$ ,  $t(2509) = 19.43$ ,  $p < .05$ ).

### *Multilevel Models – Substance Use Composite*

The ICC indicated that 3.4% of substance use variance was due to variance across schools. Three models were used to analyze how descriptive norms held towards college athletes and close friends predicted personal substance use (Table 13). In Model 1, descriptive norms held towards the distal reference group were positively associated with past 30-day substance use ( $\beta = .04$ ,  $t(2378) = 4.89$ ,  $p < .05$ ). Likewise, descriptive norms held towards the proximal reference group were positively associated with past 30-day substance use in Model 2 ( $\beta = .11$ ,  $t(2465) = 13.25$ ,  $p < .05$ ). However, when athlete and close friends norms were included in Model 3, only norms held towards the proximal

reference group were positively associated with substance use ( $\beta = .11$ ,  $t(2462) = 12.29$ ,  $p < .05$ ).

## **Discussion**

Although previous studies assessed the association between descriptive norms and substance use of student-athletes, findings were mixed in terms of the ability of proximal and distal reference groups to predict use. To address this contradiction in the literature, this study examined proximal and distal reference groups using multi-level modeling that controlled for factors known to contribute to substance use of student-athletes (e.g., sex, race/ethnicity, seasonal status, division). Specifically, we tested the ability of close friend (proximal) and college athlete (distal) norm reference groups to predict personal substance use of student-athletes, with the hypothesis being that the proximal reference group would act as a predictor and that distal reference group would not act as a predictor.

The findings from this study supported previous research that suggests people tend to perceive a higher prevalence of substance use among distal reference groups as compared to proximal reference groups (Agostinelli et al., 2003; Borsari & Carey, 2003; Carey et al., 2006; Larimer et al., 2009), especially regarding the substance use composite score. The difference in student-athlete perception of proximal-distal substance use was considerable (15% of close friends vs. 27% of college athletes). On the other hand, the difference in student-athlete perception of proximal-distal heavy episodic drinking was very small (49% of close friends vs. 51% college athletes). Although the difference in

perception of drinking was statistically significant, the finding should be interpreted in consideration of the study's large sample size.

In terms of the substance use composite, the study's findings were consistent with previous research that suggests proximal norm reference groups are better predictors of substance use than distal norm reference groups (Agostinelli et al. 2003; Borsari & Carey, 2003; Carey et al., 2006; Grossbard et al., 2009; Larimer et al., 2009). As the authors hypothesized, when proximal and distal reference groups were included in the same model, and after controlling for several key factors related to substance use among student-athletes, only the proximal group was able to predict self-reported substance use behaviors. As mentioned earlier in the manuscript, certain social theories state that people are more capable of assessing information regarding groups that they belong to and identify with, as compared to groups of people in which there is a lesser sense of belonging (Festinger, 1954; Hogg & Abrams, 1988; Latane, 1981; Tajfel & Turner, 1986). Although participants in the current study may identify as being a student-athlete, it seems likely that they would identify stronger with a group of close friends than the general population of college athletes and estimate less extreme substance use behaviors of those friends. It is important to note that this finding does not suggest that the distal reference group norm was not important in relation to personal substance behaviors. When placed in a model of its own (Model 1), norms held towards the distal reference group significantly predicted substance use; however, when included in a model with norms held towards the proximal reference group (Model 3), the distal reference group no

longer acted as a predictor. This indicates that the distal reference group acted as a predictor, but may not have made any independent contribution after controlling for the proximal reference group.

In terms of heavy episodic drinking, the study's findings were not consistent with previous research on proximal-distal norms acting as predictors of substance use. Although the proximal norms were a significant predictor of drinking when both proximal-distal norms were included in the same model, the regression coefficient for the proximal norm was extremely small. Thus, from a practical standpoint, heavy episodic drinking was not predicted by either proximal or distal norms when included in the same model. It should be noted, however, that proximal and distal norms predicted heavy drinking when placed in their own models.

#### *Implications for Future Practice and Research*

The findings from this study are important from an intervention perspective. The goal of an intervention based on Social Norms Theory is to correct a target population's exaggerated perceptions of others' substance use, which is done by informing the target population about the discrepancy between their misperceptions and others' actual behavior regarding substance use. The reference group used to base the discrepancy will determine the amount of resources needed to gather information about that group's accurate substance use behaviors (Berkowitz, 2005). A distal reference group may require fewer resources to gather information about as compared to a proximal reference group. For instance, suppose that an intervention targeted towards student-athletes was framed

around accurate substance use behaviors of a distal reference group, such as college student-athletes in general. To gather information about substance use of student-athletes as a whole, one would have to go online and locate national data that is easily available. On the other hand, if that same intervention was framed around a more proximal reference group, such as student-athletes at the particular college of interest, then that reference group must be recruited and surveyed about their personal substance use behaviors. Once analyzed, the survey data can be used for the intervention. If the reference group is even closer in proximity to the target population, such as close friends, then each participant's close friends must be located and surveyed about personal substance use behaviors.

The study's results in Model 1 suggest that health professionals who lack the resources to conduct a proximal-framed intervention among student-athletes should not be dismayed to conduct an intervention using a distal-framed intervention. Published social norm interventions among student-athletes using a distal reference group have reported experiencing successful results in lowering student-athletes' exaggerated perceptions and substance use behaviors (Dumas & Haustveit, 2008; Dumas, Haustveit, & Coll, 2010; LaBrie, Hummer, Grant, & Lac, 2010; Perkins & Craig, 2006).

This study also has important implications for future research. Findings from this study regarding the substance use composite compliment findings from other studies that indicate proximal reference groups are better predictors of personal substance use than distal reference groups. However, this does not necessarily mean that social norms

interventions would be more effective by framing an intervention around a proximal norm as compared to a distal norm. Since the goal of social norm interventions is to lower misperceptions by showing the target audience the difference between their perception of others' substance use and the reality of others' use (Berkowitz, 2005), then if proximal norms are related to one's current substance use behaviors, then it would seem logical that framing an intervention around a proximal group might not produce large enough of a discrepancy between perception and behavior for the intervention's content. Future studies should explore if there is a difference in effectiveness between proximal-framed or distal-framed reference group interventions.

Our study also has an implication for future research in terms of expanding studies on student-athlete norms beyond that of alcohol and marijuana use. Previous studies on student-athlete norms have only examined perceptions around alcohol and marijuana use (Dams-O'Connor et al., 2007; Doumas et al., 2010; Frye, Allen, & Drinnon, 2010; Grossbard et al., 2009; Hummer et al., 2009; LaBrie et al., 2009; Page & Roland, 2004; Perkins & Craig, 2006). Since student-athletes are also at high risk for use of other substances, including tobacco, performance enhancing drugs, and nutritional supplements (Froiland, Koszewski, Hingst, & Kopecky, 2004; McCabe, Brower, West, Nelson, & Wechsler, 2007; NCAA, 2012; Sobal & Marquart, 1994; Yusko et al., 2008), then understanding how student-athletes perceive others' use of these substances is important for planning effective interventions targeted specifically towards this population.

### *Limitations*

This study has several limitations. First, the participants were not gathered as a random sample, which limited the generalizability of the study. Second, the study was cross-sectional in design, which only allowed us to make inferences about relationships between variables, not about issues regarding time-order (e.g., norms impacting behaviors or behaviors impacting norms). Third, since most of the participants were under 21 years old, the study may not have represented substance use behaviors of student-athletes as a whole, as past research suggests that use increases as student-athletes progress from their first-year in college to their fourth-year (Cadigan et al., 2013).

Table 9. Demographic information of participants and schools

Demographics	<i>n</i>	%
Sex		
Male	1376	50.8
Female	1332	49.2
Age		
17	16	<1
18	1083	39.8
19	718	26.4
20	453	16.6
21	311	11.4
22+	140	4.1
Race/Ethnicity		
White or Caucasian	2106	79.3
Black or African American	342	12.9
Hispanic or Latino	109	3.3
Other	790	4.5
Season		
In-season	1438	53.7
Out-of-season	1241	46.3
Division		
I	1879	70.2
II	521	19.5
III	276	10.3
Region		
South	996	29.8
Midwest	724	21.6
Northeast	1026	30.7
West	601	17.9

Table 10. Multilevel model regression results for heavy episodic drinking as a function of demographics and descriptive norms towards athletes and close friends

Predictor	Model 1	Model 2	Model 3
Intercept	-0.12 (0.09)	-0.28* (0.07)	-0.23* (0.08)
Level 1			
Athlete Norms	0.06* (0.01)		0.00 (0.00)
Close Friends Norms		0.11* (0.01)	0.01* (0.00)
Male	0.38* (0.04)	0.32* (0.03)	0.31* (0.03)
Age	0.08* (0.02)	0.07* (0.01)	0.06* (0.01)
Race: Black	-0.27* (0.06)	-0.14* (0.05)	-0.14* (0.05)
Race: Hispanic	-0.18 (0.09)	-0.10 (0.09)	-0.09 (0.09)
Race: Other	-0.12 (0.08)	-0.09 (0.07)	-0.09 (0.07)
Season	-0.08* (0.04)	-0.07 (0.03)	-0.07 (0.03)
Level 2			
Division II	-0.15 (0.10)	-0.10 (0.08)	-0.09 (0.08)
Division III	0.18 (0.11)	0.15 (0.10)	0.15 (0.10)

*Note.* Standard errors are in parenthesis. \* $p < .05$ . Reference groups for sex = female, race/ethnicity = White, season = out-of-season, Division = Division I.

Table 11. Multilevel model regression results for substance use as a function of demographics and descriptive norms towards athletes and close friends

Predictor	Model 1	Model 2	Model 3
Intercept	-0.24* (0.06)	-0.26* (0.05)	-0.25* (0.05)
Level 1			
Athlete Norms	0.04* (0.01)		0.00 (0.01)
Close Friends Norms		0.10* (0.01)	0.11* (0.01)
Male	0.29* (0.03)	0.20* (0.03)	0.20* (0.03)
Age	0.01 (0.01)	0.02 (0.01)	0.02 (0.01)
Race: Black	-0.12* (0.04)	-0.11* (0.04)	-0.11* (0.04)
Race: Hispanic	-0.10 (0.07)	-0.09 (0.07)	-0.08 (0.07)
Race: Other	0.02 (0.06)	0.01 (0.06)	0.01 (0.06)
Season	-0.01 (0.03)	-0.02 (0.03)	-0.02 (0.03)
Level 2			
Division II	-0.09 (0.06)	-0.07 (0.05)	-0.06 (0.05)
Division III	0.13 (0.07)	0.10 (0.07)	0.10 (0.07)

*Note.* Standard errors are in parenthesis. \* $p < .05$ . Reference groups for sex = female, race/ethnicity = White, season = out-of-season, Division = Division I.

## CHAPTER VI

### EPILOGUE

Traditionally, an epilogue acts as a summary section of a literary work that allows authors to round out major themes presented within a text. This epilogue will function as a platform for a deeper discussion and reflection of the dissertation's findings that may have been too lengthy or philosophical to be placed within Chapters IV and V. Below, I will present the overall evolution of the field of Social Norms Theory research, explain how my dissertation fits within the field's progression, and describe next steps in my future study in Social Norms Theory. In other words, this section will serve to show how my dissertation has contributed to the current trajectory of Social Norms Theory research and how my findings push the field forward.

#### **Evolution of the Field**

It is important to note the integral function of Social Norms Theory before painting an overall picture of its historical progression. It is clear that practical application is at the very core of Social Norms Theory. A major assumption of the theory is that if one's erroneous perceptions of others' problem behaviors are corrected, then that person will begin to change their own behaviors towards a healthy norm. This assumption suggests that intervention is the primary focus of Social Norms Theory. Research reflects this focus. In almost every publication in the field, authors related their findings to practical implications for social norms intervention programming. The common thread

found throughout the evolution of Social Norms Theory is how research findings can be used in programs to change participant perceptions and behaviors.

Chapter II of this dissertation presented the beginning of Social Norms Theory with Perkins and Berkowitz' groundbreaking study and how research on the theory has progressed into its current state. Essentially, as one reads through the literature, it becomes evident that the field of Social Norms Theory has evolved through its application to new populations, problem behaviors, reference groups, and interventions (Figure 3). Initially, Social Norms Theory research was conducted on the overall college student population. However, researchers soon began to apply the theory to specific subpopulations in the college arena and also to populations outside of the college context. For instance, Social Norms Theory has been used to study members of college Greek societies (e.g., fraternities, sororities), student-athletes, high school students, and non-student adults. Based from the intervention-focus of the theory, studying social norms among new populations has provided researchers with knowledge of how well the perceptions and behaviors of these new groups fit within Social Norms Theory and how future interventions can be fine-tuned among these specific groups.

The field has also evolved in research of Social Norms Theory within various problem behaviors. Perkins and Berkowitz initial study investigated unhealthy drinking practices among college students. Although alcohol use has remained the primary behavior studied in Social Norms Theory, research has begun to extend in other problem behaviors, such as risky sexual practices, body image issues, and gambling. Similar to

expanding the field among new populations, studying different problem behaviors has served a very practical purpose. By investigating certain behaviors from a Social Norms Theory perspective, researchers have been enabled to determine if the theory could act as an effective prevention approach to changing people's perceptions of these different behaviors.

A major progression in the field of Social Norms Theory has been the research of reference groups. An increased number of studies have begun to test which reference groups are better predictors of personal substance use. In terms of injunctive norms, studies have begun to explore a wide variety of reference groups that are specific in relation to the participants being studied. For instance, this dissertation examined reference groups that were likely to be important to the lives of student-athletes, but had yet to be studied. By examining reference groups specific to certain people groups, the field has continued in its understanding of which reference groups need to be addressed within social norms interventions framed from an injunctive norm perspective. Similarly, the field has begun to examine reference group differences in terms of descriptive norms, such as the different perceptions that participants hold towards proximal-distal reference groups. Researchers have also begun to compare injunctive and descriptive norms to each other. Most studies in the past have focused on each norm in its own respect. The progression of research on reference groups of injunctive and descriptive norms have provided researchers with knowledge of which types of norms are most impactful on participant perceptions and behaviors, which can be of practical use when framing an

intervention around those reference groups.

Finally, Social Norms Theory research has grown in its study of the effectiveness of different interventions. Initially, interventions based on Social Norms Theory were conducted as mass marketing campaigns that used flyers, student newspaper ads, student television/radio ads, and other promotional efforts to educate students about actual drinking rates and acceptability of drinking among their peers. Social norms intervention research soon spread into other modes of prevention programs, such as interactive computer-based and online curriculums, and also individual counseling sessions. The evolution of intervention research in Social Norms Theory has provided researchers with evidence of which methods of intervention show the most promise in creating change among certain subpopulations.

### **Contribution of Current Study**

Continuing in the trend of Social Norms Theory research, this dissertation extended the field in its study of reference groups that are relevant to a certain population (Figure 4). Specifically, the purpose of this dissertation was to test unstudied and contradictory reference group research findings of Social Norms Theory as it applies to college student-athletes. As mentioned in Chapter II, student-athletes are at-risk for use of certain substances. Although social norms interventions are considered a key individual-based prevention strategy for student-athlete substance use, gaps still existed in the literature regarding injunctive and descriptive norms held among this population. In terms of injunctive norms, the literature review suggested there was a dearth of research on

comparisons between norm reference groups specific to student-athletes. In terms of descriptive norms, the literature indicated mixed findings in terms of either proximal or distal reference groups being a stronger predictor of student-athlete substance use behaviors. This dissertation addressed these gaps by analyzing data from two large, national samples of NCAA student-athletes who were surveyed about their personal substance use behaviors, injunctive norms held towards teammates and coaches, and descriptive norms held towards close friend (proximal) and college athlete (distal) reference groups. The study's multi-level regression analysis indicated that norms held towards teammates and coaches acted as positive predictors of substance use and that, when placed in their own regression models, both proximal and distal norms acted as predictors of substance use.

True to the practical roots of Social Norms Theory research, the findings from this dissertation have potential implications for social norms interventions. It should be noted, first off, that any implications should be considered in light of the dissertation's methodological limitations. This study simply analyzed the association between student-athlete norms and substance use behaviors, which did not allow for making causal inferences. However, even though this study was cross-sectional, there are still aspects of the findings that could be gleaned for practical efforts in preventing substance use. For instance, the major finding in Chapter IV was that injunctive norms towards both teammates and coaches acted as predictors of substance use. In terms of practice, these findings indicate that health professionals who intend to conduct a social norms

intervention among student-athletes may want to consider programming that does not solely focus on peer norms, but one that also targets coach norms. This would mean working closely with coaches during an intervention by surveying their opinions towards substance use and sharing the results with their student-athletes.

The major finding in Chapter V was that, when placed in a regression model with no other norms, the athlete norms significantly predicted substance use; however, when included in a model with close friend norms, only the close friends norms acted as a predictor. These findings do not suggest that distal descriptive norms are not important in relation to personal behaviors; rather, this finding showed that athlete norms acted as predictors, but may have been washed out in the presence of close friend norms. This finding is noteworthy from a health programming standpoint. As mentioned in Chapter V, when compared to interventions based upon a distal reference group, interventions framed from a proximal reference group (e.g., close friends) would require much more time to gather substance use data for the intervention's content. Although findings suggest that interventions may be stronger if centered on a proximal group, a distal-based intervention may still have an impact on correcting perceptions and changing behaviors if necessary resources are not available to conduct a proximal-based intervention. Other studies reflect this sentiment, as several published distal-based social norm interventions for student-athletes have shown success in lowering student-athletes' exaggerated perceptions and substance use behaviors.

## **Next Steps**

Based from this dissertation and past Social Norms Theory research, there are a few next steps in research that I plan to take in order to extend the literature on college student-athlete norms (Figure 4). First, I will study student-athlete reference groups that have yet to be examined from a Social Norms Theory perspective, regarding both injunctive and descriptive norms. In terms of injunctive norms, I plan on studying the influence of norms held towards team captain, athletic trainer, athletic director, and parent reference groups on personal behavior. Understanding the influence of these reference groups on personal behavior will be important for deciding if these groups are worthwhile for including as references in intervention content. In terms of descriptive norms, I plan on comparing the influence of norms held towards team captains and regular teammates on substance use behavior. Although descriptive norms held toward team captains have been somewhat studied in past research, it is important to know if making a distinction between captains and regular teammates is something that needs to be considered when planning social norms interventions for student-athletes. Also, I plan on addressing the major unknown of whether injunctive or descriptive norms are better predictors of personal substance use behaviors among student-athletes. Studies comparing injunctive and descriptive norms have been conducted in other populations; however, this has yet to be researched among student-athletes. Knowing which type of norm is more powerful towards influencing behavior would be a great addition to the literature and a very practical finding in terms of framing an intervention around either injunctive norms,

descriptive norms, or both.

I also plan on furthering the literature by conducting a longitudinal study among student-athletes. Currently, it is unknown if faulty perceptions that are corrected by an intervention begin to creep in again over time. In other words, it is unknown if social norms interventions produce lasting or temporary change in perceptions and behaviors. By knowing how long perceptions remain corrected by an intervention, researchers would be able to predict how often a social norms intervention should be implemented in order to produce desired effects. For instance, if research findings suggest that misperceptions on a college campus return the year after an intervention, then college administrators would want to consider implementing social norms interventions on an annual basis to maintain healthy perceptions held by students.

Finally, I intend to study substances used by student-athletes that have yet to be addressed in Social Norms Theory. This dissertation extended the research by including tobacco in both Chapter IV and V's substance use composite score. Substances that are also relevant to student-athletes are the use of nutritional supplements and steroids. I hope to study student-athlete injunctive and descriptive norms of various reference groups regarding the use of both of these substances. Extending the research beyond alcohol, tobacco, and marijuana can be a practical value for interventions. Knowing the effect of injunctive and descriptive norms on personal use of these substances can be important when crafting interventions that are focused around the use of these drugs.

## **Final Conclusion**

Substance use among college student-athletes is an important public health issue, requiring the prevention efforts of health professionals. Interventions based upon the Social Norms Theory may be a viable option for college administrators interested in lowering and preventing substance use of their student-athletes. Research suggests that evidence-based interventions tend to be more effective than interventions that are not founded in the literature. The findings in this dissertation have contributed to the current conversation taking place in Social Norms Theory literature, especially in the area of reference groups. These findings may act as a resource for the planning of future interventions be used to guide the next steps in social norms research in the student-athlete population and for the field as a whole.

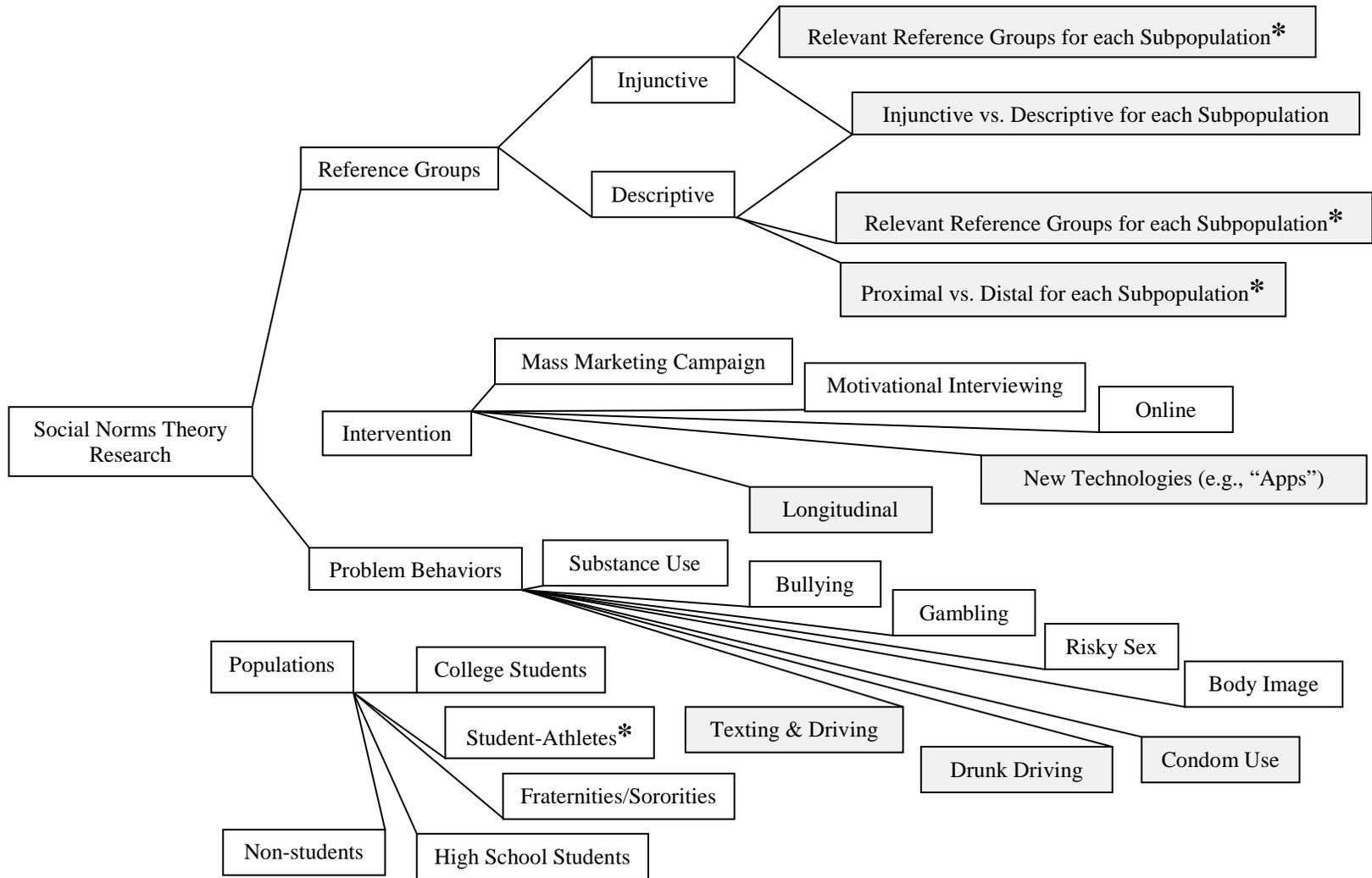


Figure 2. Evolution of Social Norms Theory. Asterisk = current study, gray color = next steps in research

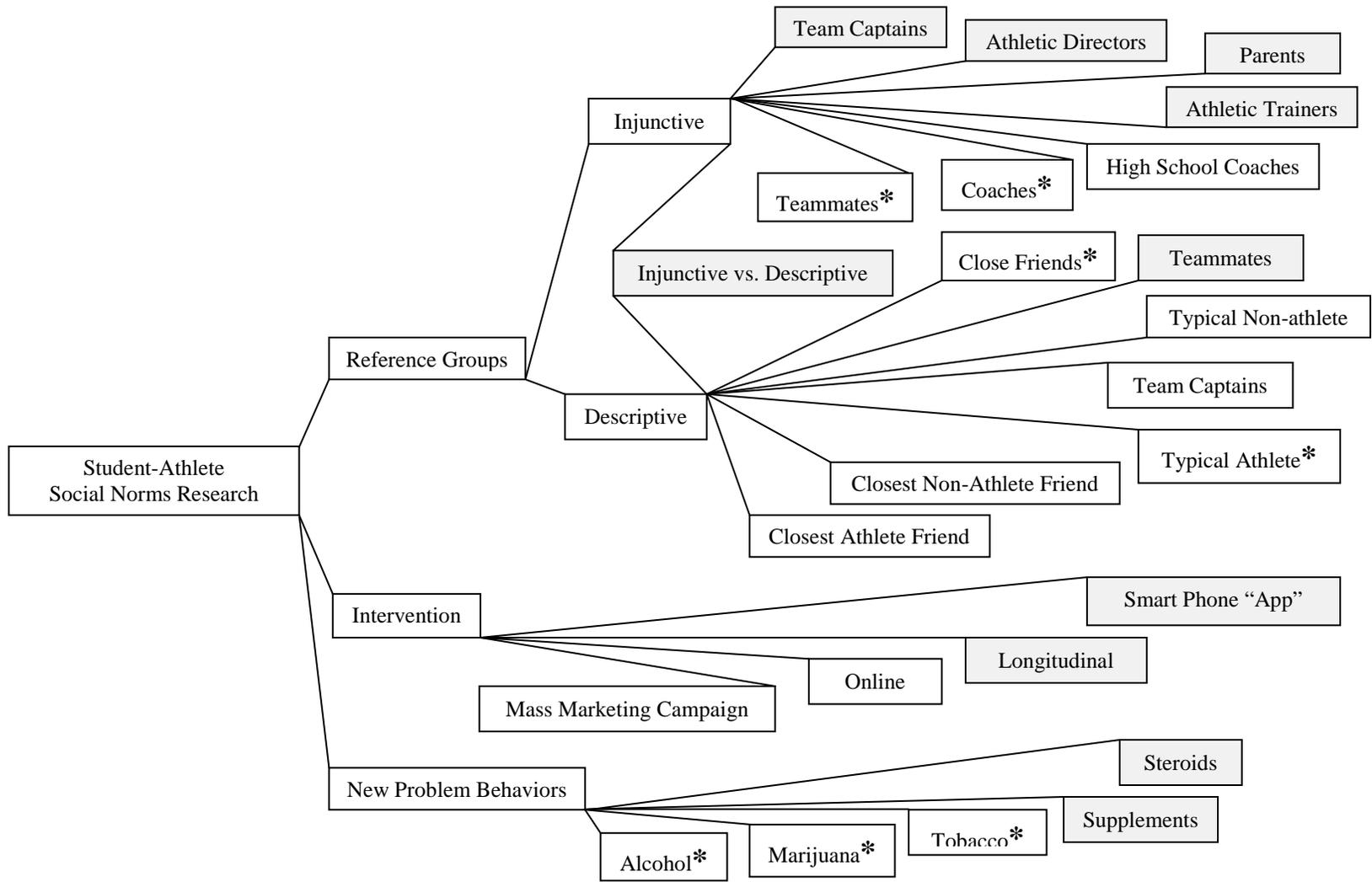


Figure 4. Evolution of Social Norms Theory for student-athletes. Asterisk = current study, gray color = next steps in research

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APPENDIX A

SURVEY ITEMS FOR RESEARCH QUESTION #1

**\*3. Please select your college or university.**

**4. What is your year of eligibility? (Mark one)**

- First year
- Second year
- Third year
- Fourth year
- Fifth year

**5. What is your sex?**

- male
- female

**6. MALE athletes only: Please select the sport in which you participate under the appropriate column. If you participate in multiple sports teams, select the one you are participating in now (or will be next).**

- Baseball
- Basketball
- Bowling
- Cheerleading
- Cross Country
- Fencing
- Football
- Golf
- Gymnastics
- Ice Hockey
- Lacrosse
- Rifle
- Rowing
- Skating
- Soccer
- Swimming/Diving
- Tennis
- Track and field, Indoor
- Track and field, Outdoor
- Water Polo
- Wrestling
- Volleyball

Other (please specify)

**7. FEMALE athletes only: Please select the sport in which you participate under the appropriate column. If you participate in multiple sports teams, select the one you are participating in now (or will be next).**

- Basketball
- Bowling
- Cheerleading
- Cross Country
- Fencing
- Field Hockey
- Golf
- Gymnastics
- Ice Hockey
- Lacrosse
- Rifle
- Rowing
- Skiing
- Soccer
- Softball
- Swimming/Diving
- Tennis
- Track and field, Indoor
- Track and field, Outdoor
- Water Polo
- Volleyball

Other (please specify)

**10. What is your age?**

- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25+

**11. Is your sport currently "in season" or "off season?"**

- In season (currently competing)
- off season (not currently competing)

**12. What is your race? Select all that apply.**

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic or Latino
- Native Hawaiian or Other Pacific Islander
- White or Caucasian

Other (please specify)

**14. During the PAST 30 DAYS, on how many days have you used the following?**

	I have never used/done this	I have used this but not in the past 30 days	Once	Twice	3-5 days	6-9 days	10+ days
cigarettes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
smokeless tobacco (ex, chewing tobacco, snuff, dip, or snus)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
marijuana	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**19. During the PAST 30 DAYS, on how many days did you get drunk?**

**23. How would the following groups of people feel about you getting drunk frequently?**

	Strongly disapprove	Somewhat disapprove	Neither approve nor disapprove	Somewhat approve	Strongly approve
Teammates	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coaches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Close friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**24. How would the following groups of people feel about you using marijuana?**

	Strongly disapprove	Somewhat disapprove	Neither approve nor disapprove	Somewhat approve	Strongly approve
Teammates	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coaches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Close friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**25. How would the following groups of people feel about you using tobacco?**

	Strongly disapprove	Somewhat disapprove	Neither approve nor disapprove	Somewhat approve	Strongly approve
Teammates	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coaches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Close friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX B

SURVEY ITEMS FOR RESEARCH QUESTION #2

**\*2. Please select your college or university.**

**3. What is your team's NCAA division? (Mark one)**

- I
- II
- III

**4. What is your year of eligibility? (Mark one)**

- First year
- Second year
- Third year
- Fourth year
- Fifth year

**5. What is your gender?**

- male
- female

**6. What is your age?**

- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24

**7. What is your ethnic origin?**

- American Indian/Alaskan Native
- Hispanic
- Asian/Pacific Islander
- White (non-Hispanic)
- Black (non-Hispanic)

Other (please specify)

**8. MALE athletes only: Please select the sport in which you participate under the appropriate column. If you participate in multiple sports teams, select the one you are participating in now (or will be next).**

- Baseball
- Basketball
- Bowling
- Cross Country
- Fencing
- Football
- Golf
- Gymnastics
- Ice Hockey
- Lacrosse
- Rifle
- Rowing
- Skiing
- Soccer
- Swimming/Diving
- Tennis
- Track and field, Indoor
- Track and field, Outdoor
- Water Polo
- Wrestling
- Volleyball

**9. FEMALE athletes only: Please select the sport in which you participate under the appropriate column. If you participate in multiple sports teams, select the one you are participating in now (or will be next).**

- Basketball
- Bowling
- Cross Country
- Fencing
- Field Hockey
- Golf
- Gymnastics
- Ice Hockey
- Lacrosse
- Rifle
- Rowing
- Skiing
- Soccer
- Softball
- Swimming/Diving
- Tennis
- Track and field, Indoor
- Track and field, Outdoor
- Water Polo
- Volleyball

**14. During the PAST 2 WEEKS, how many times have you had five or more drinks at a sitting?**

- None
- Once
- Twice
- 3 to 5 times
- 6 to 9 times
- 10 or more times

**17. During the PAST 30 DAYS, on how many different occasions (if any) have you used marijuana or hashish?**

- |  |                          |                          |
|--|--------------------------|--------------------------|
| <input type="radio"/> Never used marijuana | <input type="radio"/> 10 | <input type="radio"/> 21 |
| <input type="radio"/> 0                    | <input type="radio"/> 11 | <input type="radio"/> 22 |
| <input type="radio"/> 1                    | <input type="radio"/> 12 | <input type="radio"/> 23 |
| <input type="radio"/> 2                    | <input type="radio"/> 13 | <input type="radio"/> 24 |
| <input type="radio"/> 3                    | <input type="radio"/> 14 | <input type="radio"/> 25 |
| <input type="radio"/> 4                    | <input type="radio"/> 15 | <input type="radio"/> 26 |
| <input type="radio"/> 5                    | <input type="radio"/> 16 | <input type="radio"/> 27 |
| <input type="radio"/> 6                    | <input type="radio"/> 17 | <input type="radio"/> 28 |
| <input type="radio"/> 7                    | <input type="radio"/> 18 | <input type="radio"/> 29 |
| <input type="radio"/> 8                    | <input type="radio"/> 19 | <input type="radio"/> 30 |
| <input type="radio"/> 9                    | <input type="radio"/> 20 |                          |

**19. How frequently have you smoked cigarettes DURING THE PAST 30 DAYS?**

- Never smoked cigarettes
- Not at all in past month
- Less than one cigarette per day
- One to five cigarettes per day
- About one-half pack per day
- About one pack per day
- About one and one-half packs per day
- Two packs or more per day

**20. During the PAST 30 DAYS, on how many different occasions have you used smokeless tobacco (dip)?**

- Never used smokeless tobacco
- None in past month
- Once
- Twice
- 3 to 5 times
- 6 to 9 times
- 10 or more times

**38. What PERCENTAGE of college athletes do you think.... Enter a number between 0 and 100. Do not add % or "percent."**

currently drinks alcohol (at least once during the past 30 days)?

consumed 5 or more drinks in one sitting during the past 2 weeks?

currently smokes cigarettes (smoked during the past 30 days)?

currently uses smokeless tobacco (used during the past 30 days)?

currently uses marijuana (used during the past 30 days)?

**39. What PERCENTAGE of YOUR close friends.... Enter a number between 0 and 100. Do not add % or "percent."**

currently drinks alcohol (at least once during the past 30 days)?

consumed 5 or more drinks in one sitting during the past 2 weeks?

currently smokes cigarettes (smoked during the past 30 days)?

currently uses smokeless tobacco (used during the past 30 days)?

currently uses marijuana (used during the past 30 days)?

## APPENDIX C

### IRB APPROVAL

from: IRB <irbcorre@uncg.edu>  
to: dlwyrick@uncg.edu  
cc: cmseitz@uncg.edu,  
irbcorre@uncg.edu

date: Fri, Nov 9, 2012 at 3:41 PM  
subject: IRB Notice

RE: Notice of IRB Exemption  
Exemption Category: 4.Existing data, public or deidentified  
Study #: 12-0385  
Study Title: The Role of Proximal and Distal Social Norms on College Student-Athlete Substance Use

This submission has been reviewed by the above IRB and was determined to be exempt from further review according to the regulatory category cited above under 45 CFR 46.101(b).

#### Study Description:

This study will be a secondary data analysis of 12-0101. Student researcher will be analyzing data from survey questions regarding athlete substance use, athlete perceptions of peer substance use, and athlete perceptions of peer/coach approval/disapproval of substance use.

#### Investigator's Responsibilities

Please be aware that any changes to your protocol must be reviewed by the IRB prior to being implemented. The IRB will maintain records for this study for three years from the date of the original determination of exempt status.

CC:  
Christopher Seitz, Public Health Education  
ORC, (ORC), Non-IRB Review Contact

APPENDIX D

PERMISSION TO USE TABLE 1

from: Christopher Seitz <cmseitz@uncg.edu>  
to: info@hamptonpress.com  
date: Thu, Feb 28, 2013 at 12:47 PM  
subject: Permission to use table  
mailed-by: uncg.edu

Dear Editor of Hampton Press,

My name is Christopher Seitz. I'm a graduate student at the University of North Carolina at Greensboro. I'm working on my dissertation and was wondering if I could have your permission to use a table from one your publications. The table is from the book "Changing the Culture of College Drinking." The table is in Ch 13 on page 196 and is called "Assumptions of Social Norms Theory."

I have already contacted the author of the chapter (Alan Berkowitz) and he said I could use the table, but that I would probably need official permission from Hampton Press.

I look forward to hearing from you,

Chris  
cmseitz@uncg.edu

from: hamptonpr1@aol.com  
to: cmseitz@uncg.edu  
date: Thu, Feb 28, 2013 at 1:13 PM  
subject: Re: Permission to use table  
mailed-by: aol.com  
signed-by: mx.aol.com

Dear Chris

Please let this email serve as Hampton Press' permission for you to reprint the table described below in your dissertation. Please credit our publication appropriately.

Sincerely,

Barbara Bernstein  
President

from: Christopher Seitz <cmseitz@uncg.edu>  
to: hamptonpr1@aol.com  
date: Thu, Feb 28, 2013 at 2:06 PM  
subject: Re: Permission to use table  
mailed-by: uncg.edu

Dear Barbara,

I appreciate your permission to use the table. I will be sure to cite the publication in the dissertation.

Thanks again!

Chris