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## Athlete Alcohol Use and Alcohol-Related Consequences: The Role of Drinking Motives

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ATHLETE ALCOHOL USE AND ALCOHOL-RELATED CONSEQUENCES:  
THE ROLE OF DRINKING MOTIVES

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## Abstract

Intercollegiate athlete alcohol use, particularly in softball athletes, is higher compared to nonathletes and they experience greater alcohol-related consequences. Motivation to drink alcohol is a strong predictor of alcohol use and alcohol-related problems in college students, including collegiate athletes. Drinking motives are reasons why people consume alcohol, including reasons that are specific to the context of athletics. Two dimensions underlie drinking motives: positively or negatively reinforcing motives and internal or external motives (Cox & Klinger, 1988). In this study the influence of sport-related and general drinking motives on alcohol use and negative alcohol-related consequences was examined in 721 collegiate softball athletes from 62 teams in the United States. Athlete drinking motives clusters were formed to better understand what cluster membership places athletes at highest risk for heavy drinking or negative consequences. Athletes completed surveys online including demographics information, the Athlete Drinking Scale (ADS; Martens, Watson, Royland, & Beck, 2005), the Drinking Motives Questionnaire-Revised (DMQ-R; Cooper, 1994; Cooper, Russell, Skinner, & Windle, 1992), alcohol consumption and binge drinking items, and the Rutgers Alcohol Problems Index (RAPI; White & Labouvie, 1989). ADS subscales included Positive Reinforcement, Team, and Sport-Related Coping. DMQ-R subscales included Social, Enhancement, and Coping. Multilevel modeling, accounting for age of alcohol use onset and competitive division, revealed that Positive Reinforcement motives were associated with more alcohol use, binge drinking, and alcohol use consequences. Social motives predicted alcohol use, but not binge drinking or consequences, whereas Enhancement motives predicted binge drinking and consequences, but not alcohol use. Coping motives were associated with more consequences, but not alcohol use or binge drinking. The more athletes endorsed Conformity motives, the less alcohol they consumed

and the less negative consequences they experienced. Team and Sport-Related Coping motives were unrelated to alcohol use, binge drinking, and consequences. Notably, the between-team variance for alcohol use (26%), binge drinking (19%), and consequences (5%) were all significant, indicating team-level influences on drinking motives. A model-based cluster analysis of the seven drinking motives resulted in five clusters with three clusters comprised of moderate-level motives, one cluster with low motives, and one cluster with high motives. Overall, the clusters significantly predicted alcohol use, binge drinking, and negative consequences. The high motives cluster resulted in significantly higher binge drinking and consequences, compared to the other motive clusters. Implications for alcohol prevention programming are discussed in light of these results.

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My doctoral degree is dedicated in veneration of my mother,

Audrey Jean Lefebvre Pitts

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Athlete alcohol use and alcohol-related consequences:

The role of drinking motives

## **Chapter 1: Background**

### **Athlete Alcohol Use**

Alcohol consumption is widespread among student-athletes. In a recent national study of over 21,000 collegiate athletes, 81% reported alcohol use during the past year (National Collegiate Athletic Association [NCAA], 2014). Indeed, student-athletes are considered an at-risk subpopulation of college students because they drink significantly more alcohol and engage in binge drinking more often than their non-athlete counterparts (Martens, Dams-O'Connor, & Beck, 2006). Well-controlled studies comparing athletes and non-athletes indicate alcohol use among student-athletes is 3% to 5% higher (Leichliter, Meilman, Presley, & Cashin, 1998; Nelson & Wechsler, 2001; Wechsler, Davenport, Dowdall, Grossman, & Zanakos, 1997). Furthermore, binge drinking is common among alcohol using student-athletes: Approximately half of athletes engage in binge drinking compared to 42% for non-athletes (Ford, 2007; Leichliter et al., 1998; Nelson & Wechsler, 2001; Wechsler et al., 1997). Frequent binge drinking (defined as three or more binges within a two-week period) also occurs at a high rate, approximately 25% for female athletes during the competitive season and 35% during the off-season (compared to 15% - 20% for female non-athletes; Brenner & Swanik, 2007; Nelson & Wechsler, 2001; Wechsler et al., 1997).

Given the rates of alcohol use, it is not surprising that athletes experience a multitude of adverse health, social, and legal outcomes due to their drinking. Specifically, participation in collegiate athletics is correlated with experiencing negative consequences associated with

alcohol use (Leichliter et al., 1998; Nelson & Wechsler, 2001; Wechsler et al., 1997). As a result of alcohol use, athletes are more likely to drive or ride with someone under the influence of alcohol, have academic or relationship problems, and engage in unplanned or unprotected sex, in comparison to non-athletes. Intercollegiate athletes also reported experiencing negative consequences from alcohol use during the past year: 63% reported a hangover, 51% reported nausea or vomiting, 30% reported memory lapses and regret over an action, 23% reported getting into a fight, 14% reported driving under the influence, 9% reported getting in trouble with police or other college authorities, and 7% reported that they damaged property or pulled a fire alarm (NCAA, 2014). Moreover, athletes experience alcohol-related consequences as more aversive due to their status as a more monitored sub-population of college students. Athletes risk losing sport scholarships, may be formally sanctioned with legal or university citations, or may lose their status to participate in intercollegiate athletics altogether. Particularly problematic for student-athletes is the potential of alcohol to detrimentally impact physical and cognitive performance and result in deficits in athletic performance (Grossbard, Hummer, LaBrie, Pederson, & Neighbors, 2009).

### **Drinking Motives and Alcohol Use**

A growing body of research has identified drinking motives as an important predictor of alcohol use and related problems. Drinking motives represent a common pathway to alcohol use, and such pathways may inform development of effective prevention and intervention programs (Cooper, 1994; Cox & Klinger, 1988; Kuntsche, Knibbe, Gmel, & Engels, 2005). Understanding the factors that contribute to alcohol use is especially important in the collegiate athlete population, as a large percentage of athletes engage in risky drinking and may experience significant negative consequences as a result. Prevention of athlete high risk drinking may be

improved with a better understanding of the motivations for such drinking patterns, and ultimately enhance student-athletes' academic, emotional, and physical performance.

Alcohol expectancies provide a theoretical framework for understanding the relationship between environmental and cognitive influences, and drinking behaviors. Alcohol outcome expectancy approaches are based on social learning perspectives in which people drink due to learned expectations of the effects of alcohol. Expectancies precede drinking motives and are defined as personal beliefs about the positive or negative effects of consuming alcohol (Baer, 2002). These expectancies then drive the use of alcohol (Jones, Corbin, & Fromme, 2001). For instance, athletes' alcohol expectancies predicted heavy drinking, with positive expectancies accounting for a larger proportion of the variance compared to negative expectancies (Zamboanga, Horton, Leikowski, & Wang, 2006).

The notion that individuals drink to attain a valued outcome is referred to as *drinking motives* (Cooper, 1994; Cox & Klinger, 1988). In essence, drinking motives represent reasons to drink, or the function of alcohol use. Basic operant conditioning principles underlie people's motivations to drink alcohol, such that alcohol use may either enhance positive affect or reduce negative affect. Drinking expectancies explain the personal belief of how alcohol intake will affect behavior, emotion, and cognition, whereas drinking motives are responsible for the decision to drink alcohol (Cox & Klinger, 1988). Drinking motives are a subjective decisional framework for alcohol use based upon individual experience, situations, and expectancies (Carpenter & Hasin, 1998; Cox & Klinger, 1988).

Cox and Klinger (1988) conceptualized two underlying dimensions of drinking motives: internal or external source of motive and positively or negatively reinforcing motives. The sources of these expected effects could either be internal, personal affective change after alcohol

use, or external, the social environment. The valence of expected outcomes is to use alcohol to celebrate, enjoy yourself, or be sociable (e.g., enhance positive affect) or to cope or assist in regulating unpleasant emotions (e.g., reduce negative affect; McCarty & Kaye, 1984).

Accordingly, four drinking motives are generated in this model and constitute the final antecedents to drinking (Cooper, 1994): positively reinforcing internal motives (drinking to enhance positive mood states), positively reinforcing external motives (drinking to increase enjoyment in social situations), negatively reinforcing internal motives (drinking cope with a negative mood state), and negatively reinforcing external motives (drinking to avoid rejection from social group). This structure is frequently measured using the Drinking Motives Questionnaire-Revised (DMQ-R; Cooper, 1994), which measures four drinking motives that correspond to the model: enhancement, social, coping, and conformity. This structure is confirmed with young adults (Kuntsche et al., 2005; MacLean & Lecci, 2000) and adults (Crutzen, Kuntsche, & Schelleman-Offermans, 2013; Engels, Wiers, Lemmers, & Overbeek, 2005).

To delineate this model more thoroughly, enhancement motive represents drinking to enhance pleasant feelings and is internally generated with a positive expectancy (Kuntsche et al., 2005). Social motive is drinking to obtain a social reward and is externally generated with a positive expectancy. Coping motive represents attenuation or avoidance of negative emotions (or to feel sedated) and is internally generated with negative expectancy. Conformity motive is drinking to avoid social rejection or censure and is externally generated with a negative expectancy (Kuntsche et al., 2005). Individuals adopt the aforementioned reasons to use alcohol, thus establishing the decision to consume alcohol.

Drinking motives are positively correlated with alcohol outcomes among young adults. Reviews of the literature indicate that adolescents and young adults are most likely to drink for social or enhancement reasons (Kuntsche et al., 2005), which are also most associated with alcohol use, whereas coping motives are most highly associated with alcohol-related problems in both athletes and non-athletes (Cooper, 1994; Kuntsche et al., 2005, Martens, Dams-O'Connor et al., 2006; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). Conformity motives are related to heavier drinking problems (Bradizza, Reifman, & Barnes 1999; Carey & Correia, 1997; Lyvers, Hasking, Hani, Rhodes, & Trew, 2010). Generally, the internally generated motives (enhancement and coping) are more strongly related to alcohol outcomes compared to the externally generated motives (social and conformity; Kuntsche et al., 2005).

Drinking motives are applied to specified populations to explain drinking among populations in model-based frameworks. The relationship between drinking motives and alcohol-related outcomes have been examined among college athletes (Martens, Cox, & Beck, 2003; Martens, Cox, Beck & Heppner, 2003; Martens, Ferrier, & Cimini, 2007; Zhou & Heim, 2014). Consistent with college students, collegiate student-athletes endorse social and enhancement motives as their primary reasons for drinking (Doumas, & Midgett, 2015; Evans, Weinberg, & Jackson, 1992), and are strong predictors of athlete risky alcohol use even after controlling for other predictors of alcohol use such as gender and sport-type (Martens, Watson, & Beck, 2006; O'Brien, Hunter, Kypri, & Ali, 2008). Drinking to cope is the strongest predictor of alcohol-related consequences (Martens, Cox, & Beck, 2003) as it is most strongly related to more experiences of negative alcohol-related consequences, rather than predicting alcohol consumption itself (Martens, Cox, & Beck, 2003; Yusko, Buckman, White, & Pandina, 2008). In direct comparisons between student-athletes and non-athletes, student-athletes reported higher

levels of social motives (Wilson, Pritchard, & Schaffer, 2004) and had a stronger relationship between coping motives and alcohol-related consequences (Yusko et al., 2008).

It is generally surmised that student-athletes view alcohol use as important for team cohesion (Zhou, O'Brien, & Heim, 2014) and social motives are a particularly important predictor of alcohol outcomes (O'Brien et al., 2008; Wilson et al., 2004). However, only a few research groups have assessed social/team motives for student-athlete engagement in alcohol use (i.e., Martens et al., 2003, 2006, 2011; O'Brien et al., 2008; Wilson et al., 2004). Although previous research provides some insight into the influences of motives on alcohol use, a gap remains in identifying which students may be most vulnerable to risky alcohol use and consequences as a result of distinct profile patterns in drinking motives. Thus, a need has been identified for further investigation into team-related factors that may be influencing high rates of risky alcohol use among athletes (Martens, Dams-O'Connor, & Beck, 2006), and also investigation into the combination of drinking motives that may lead to alcohol use outcomes is warranted.

### **Purpose of the Present Study**

Given the various negative outcomes of alcohol use, an increased understanding of the factors contributing to heavy drinking in student-athletes is an important component in decreasing alcohol use and associated problems, thus enhancing academic, emotional, and physical outcomes. This study will examine the role of alcohol drinking motives among collegiate softball athletes. More specifically, this study concentrates on the measurement of different drinking motives and the possible consequences on alcohol use and alcohol-related negative consequences. Although a growing body of literature supports motivational drinking models as explanations for variance in alcohol use observed among student-athletes, the



relationship between drinking motives and alcohol use and related consequences have not been examined with a nested design. This poses a significant methodological innovation, especially considering the many socially motivated explanations of risky drinking in this population (Martens, Dams-O'Connor, & Beck, 2006). Furthermore, a drinking motives cluster-based modeling statistical approach in athletes is novel, and would assist in understanding what drinking motives profiles may place athletes at increased risk of heavy drinking or negative alcohol-related consequences. The following research questions (RQs) were investigated among a national sample of collegiate softball athletes:

RQ1: Do the measures of drinking motives (DMQ-R and ADS) adequately fit this sample?

RQ2: What is the relationship between drinking motives and alcohol outcomes (consumption, binge drinking, and negative consequences) and which motives are most salient for athletes?

RQ3: Are drinking motives influenced by the team?

RQ4: Are there athlete drinking motive clusters? Do these clusters predict alcohol outcomes?

## Chapter 2: Literature Review

Although student-athlete alcohol use has received considerable attention in the literature (e.g., Leichliter et al., 1998; Lisha & Sussman, 2010; Martens, Watson, & Beck, 2006; Mays, Gatti, & Thompson, 2011; Wechsler et al., 1997), it is still unclear as to why athletes are an at-risk group in regards to alcohol use (Ford, 2007; Martens, Dams-O'Connor, & Beck, 2006; Turrisi, Mallett, Mastroleo, & Larimer, 2006). While some researchers propose sport participation is protective against alcohol use (Lisha & Sussman, 2010), others believe the prominence of alcohol use among athletes is the result of involvement in athletics itself (Begg, Langley, Moffitt, & Marshall, 1996). Indeed, a number of factors are commonly implicated in explanations for higher alcohol use among athletes: Contextual factors, excessive pressures and stress, anxiety and negative psychological symptoms, and relational reasons.

Athlete alcohol use is associated with various contextual factors, including the culture of athletics, sport-type, competitive level, and seasonal status. The culture of athletics may reinforce the excessive use of alcohol (Nolt, Sachs, & Brenner, 2013). Most athletes experience frequent exposure to alcohol endorsements from commercials and other marketing techniques during sporting events (Lisha & Sussman, 2010), and athletic celebrations in the form of alcohol consumption frequently occur at collegiate sporting events. Intercollegiate team sport athletes drink significantly more compared to individual sport athletes (Brenner & Swanik, 2007; Kulesza, Grossbard, Kilmer, & Copeland, 2014). NCAA softball athletes have a higher rate of alcohol use (80% - 88%) compared to track and field or basketball athletes (64% - 79%; NCAA, 2014). Competitive level is associated with alcohol use, such that intercollegiate athletes drink more than intramural or club athletes (Lisha & Sussman, 2010; Serrao, Martens, Martin, & Rocha, 2008). Within competitive levels of NCAA divisions, alcohol use among Division III

athletes is highest (83%), followed by Division II (79%), and Division I (78%; NCAA, 2014). Interestingly, this pattern reverses for off-season athlete binge drinking, with a significantly higher percentage of Division I and II athletes binge drink than Division III athletes (78%, 76%, and 67.5%, respectively; Brenner & Swanik, 2007). Fewer athletes drink alcohol during the competitive season (Brenner & Swanik, 2007; Selby, Weinstein, & Bird, 1990): 35% of athletes binge drink in the competitive season, whereas 56% of athletes binge drink outside the competitive season (Martin, 1998). Lower alcohol consumption during the competitive season has been linked with athlete concerns that alcohol use may increase risk for athletic injuries (Martin, 1998).

Alcohol use among athletes is also explained in terms of excessive pressures and stress. Athletes are subjected to a variety of pressures as a result of balancing multiple roles as a student and as an athlete that result in higher levels of stress (Martens, Dams-O'Connor, & Beck, 2006). Athletes are routinely tested and evaluated on their athletic performance (Lisha & Sussman, 2010), with direct consequences specific to playing time and continued athletic status. Part of the trouble balancing roles is the sheer demand on their time to attend classes, athletic practices, weight lifting, games, travel for away games, sanctioned study hours, and for many athletes, physical therapy and part-time employment. These constant physical and mental demands inherent in athletics may directly contribute to psychological symptomatology as athletes experience elevated levels of anxiety and other negative psychological symptoms (Storch, Storch, Killiany, & Roberti, 2005). Notably, this link between athlete-specific stressors and psychological health was recognized over three decades ago (Heyman, 1986). Indeed, higher alcohol use among student-athletes is associated with psychiatric symptoms and depression (Miller, Miller, Verhegge, Linville, & Pumariega, 2002), and may result in physical and

cognitive functioning deficits in athletic performance (Grossbard et al., 2009). The heightened stress experienced by student-athletes is believed to precipitate psychiatric symptomatology and the use of alcohol as a coping mechanism; although results are mixed (Martens, Dams-O'Connor, & Beck, 2006) indicating that this relationship is not yet fully understood.

Lastly, athlete alcohol use is relationally motivated, and includes the influence of teammates and authority figures. Specific to teammate influences, social norms theories posit that athletes consume alcohol at higher rates when they perceive their teammates as drinking in a similar pattern (Perkins, 2002). Interestingly, this perception is often incorrect and teammates do not consume alcohol at the rates perceived by the individual surveyed. Athlete alcohol use can vary widely between athletic teams, demonstrating variability in the social climate of alcohol use on athletic teams. Furthermore, higher rates of alcohol use in team sport athletes supports a socially motivated hypothesis.

### **Drinking Motives**

On an individual level, athletes differ in regards to why they engage in using alcohol. Motivation for behavior has proven particularly fruitful when applied to the understanding of the alcohol use epidemic among college students, including student-athletes. The motivational components of alcohol use will be explored in more detail throughout this section.

#### **Drinking Motives Among College Students**

Endorsement of drinking motives is positively associated with alcohol use (Karwacki & Bradley, 1996; Weinberger & Bartholomew, 1996). Heavy drinkers endorse more motives than moderate drinkers, thus motives can differentiate between drinking levels (Montgomery, Benedicto, & Haemmerlie, 1993; Stewart & Power, 2002). This section will describe relationships with alcohol outcome variables for each of the four motives.

**Social motives.** Social motives predict a moderate level of drinking in college students. Social motives are external motives based on positive reinforcement (Colder & O’Conner, 2002). Drinking alcohol to celebrate or facilitate quality in relationships is the most prevalent drinking motive among college students in the United States (Johnson, Rodger, Harris, Edmunds, & Wakabayashi, 2005; Klein, 1992). Such use of alcohol for social facilitation is associated with moderate drinking (Cooper, 1994; Kairouz, Gliksman, Demers, & Adlaf, 2002; Kassel, Jackson, & Unrod, 2000; Martens, Rocha, Martin, & Serrao, 2008; Weinberger & Bartholomew, 1996; Windle & Windle, 1996). The social context exerts strong influence on the drinking of college students, and the social context in college drinking is often associated with heavy alcohol use that is relatively normative (Wechsler et al., 2002). This may be especially fitting within the drinking environment of collegiate athletes. Socially motivated college student alcohol use is less likely to be associated with excessive alcohol use and alcohol-related problems, compared to students drinking for enhancement or coping motives (Cooper, 1994; Karwacki & Bradley, 1996; Simons, Correia, & Carey, 2000; Stewart, Loughlin, & Rhyno, 2001; Windle & Windle, 1996). Although all motives have been associated with higher levels of drinking, social motives were the only motives associated with non-problematic alcohol use (Ham & Hope, 2003; Labouvie & Bates, 2002). Overall, social motives, along with enhancement motives, have the strongest relationship with alcohol use accounting for 8% to 14% of the variance in alcohol use in a sample of college students (Martens, Rocha, et al., 2008).

**Enhancement motives.** Enhancement motives predict drinking rates and also generally predict alcohol-related problems. The most common enhancement motive is to enhance mood, which is positively reinforced through operant conditioning. Frequent and heavy drinking patterns are associated with enhancement motives (Colder & O’Conner, 2002), accounting for

7% to 17% of the variance in alcohol use (Martens, Rocha, et al., 2008). Heavy drinkers have high enhancement motives compared to more moderate drinkers (McCabe, 2002; Kairouz et al., 2002). Indeed, enhancement motives discriminated better than other motives between moderate and heavy college drinkers (Billingham, Parrillo, & Gross, 1993). Enhancement motives are associated with the experience of alcohol problems in some studies (Cooper, 1994; Cooper, Agocha, & Sheldon, 2000; Labouvie & Bates, 2002; Martens, Rocha, et al., 2008), but not others (Read, Wood, Kahler, Maddock, & Palfai, 2003; Simons et al., 2000). One explanation of these findings is that enhancement motives are associated with alcohol-related problems because they are mediated by coping motives. When coping motives are controlled, the direct association between enhancement motives and alcohol problems lessens or even vanishes (Kuntsche et al., 2005).

**Coping motives.** Coping motives are internal motives for drinking to reduce tension based on negative reinforcement due to decreases in negative internal states. Coping motives accounted for 3% to 6% of the variance in alcohol use in a sample of college students (Martens, Rocha, et al., 2008). Most studies find that coping motives are associated with heavy drinking (Cooper et al., 2000; Labouvie & Bates, 2002; Rutledge & Sher, 2001), but one study did not (McCabe, 2002). Coping motives are particularly associated with alcohol problems (Cooper, Frone, Russell, & Mudar, 1995; Martens, Rocha, et al., 2008; Simons et al., 2000; Windle & Windle, 1996). An extensive review of the drinking motives literature found that stress- or anxiety-based alcohol use is associated with increased drinking rates and negative consequences. Thus, using alcohol to manage negative affect is associated with greater problems compared to drinking as a result of social motives (Baer, 2002). Further, college students that endorse coping motives had significantly higher drinking problems, a pattern that was not associated with social

or enhancement motives (Kassel et al., 2000). While effective in the short term, drinking as a coping mechanism can lead to adverse long-term consequences as it appears to attempt to compensate for a lack of other adaptive coping (Cooper et al., 1995; Kassel et al., 2000).

**Conformity motives.** Conformity motivated alcohol consumption is to avoid some type of social rejection and is a negative social motive (Cooper, 1994). Conformity motives have small correlations with alcohol use, and are moderately correlated with alcohol-related problems (Martens, Rocha, et al., 2008). Conformity motives accounted for 1% to 3% of the variance in alcohol use and negative alcohol-related consequences in one sample (Martens, Rocha et al., 2008). Research on conformity motives are often neglected in the drinking motives literature. There are few research findings to report, compared to the aforementioned motive categories. Furthermore, more recent validity studies utilizing the conformity motive (Martens, Rocha, et al., 2008; Martens, Cox, Beck, & Heppner, 2003) indicated that this motive does not meaningfully contribute to predicting alcohol use as it did among adolescent samples in which it was initially conceptualized and validated.

### **Drinking Motives Among College Athletes**

Similar patterns of findings occurred upon examination of the relationship between general drinking motives and alcohol outcomes among college athletes (Martens, Cox, & Beck, 2003; Martens, Cox, Beck, & Heppner, 2003). Social and enhancement motives are the primary motives reported by student-athletes as reasons for drinking (Doumas, 2013; Evans et al., 1992). Among student-athletes, enhancement and coping motives were most strongly related to alcohol use and were uniquely associated with several quantity and frequency measures of alcohol use. In contrast, social motives were not uniquely associated with alcohol use outcomes (Martens, Cox, Beck, & Heppner, 2003). The relationship between the enhancement motive and alcohol

use is speculated to be a result of research indicating that student-athletes are more likely than non-athletes to engage in risky behaviors (Nattiv, Puffer, & Green, 1997). This research suggests that athletes have a greater motive to experience the stimulation associated with alcohol use, and thus could explain the relationship to the enhancement motive, which is more endorsed among student-athletes (Martens, Cox, Beck, & Heppner, 2003). Drinking to relax, akin to coping motive, is not significantly different between student-athletes and non-athletes (Wilson et al., 2004), as similar levels of coping-related drinking motives are endorsed among athletes (Martens et al., 2005) compared with the general college student samples (Doumas, 2013; Lecci, MacLean, & Croteau, 2002; Stewart, Zeitlin, & Samoluk, 1996). Coping motives are also associated with alcohol-related consequences among athletes, as they were among the non-athlete counterparts (Doumas, 2013; Martens, Rocha et al., 2008). Indeed, the relationship between coping motives and alcohol use is consistent with the assumption that athletes may use alcohol as a coping mechanism because of their susceptibility to experiencing an elevated level of stressors.

In general, research on the four motives, as applied to collegiate athletes, has demonstrated that the conformity motive is not as effective in predicting alcohol outcomes as the other three motives. The conformity motive is designed to assess externally generated and negatively reinforcing motivations (Cooper, 1994). However, some items included to assess this motive appear to be internally generated and may explain its psychometric weakness. However, one study (Doumas, 2013) found that conformity motives were associated with negative alcohol-related consequences for student-athletes. The conformity motives in tandem with coping motives corresponded to the highest levels of drinking among athletes in the sample (Doumas, 2013). Notably, the study sample was restricted to freshman athletes only and results might be



explained by considering the unique transition into collegiate athletics and pressures to “fit in” for new students. However, a later study with freshman student-athletes found no relationship between conformity motives and alcohol use, but did find a predictive relationship between conformity motives and alcohol-related problems among non-white athletes only (Doumas & Midgett, 2015). This suggests that there may be unspecified variables that are moderating the relationship between conformity motives and alcohol outcomes in the young adult age group.

As demonstrated, research by Martens and his colleagues (Martens, Cox, & Beck, 2003; Martens, Cox, Beck, & Heppner, 2003) have found that positively reinforcing (e.g., social) and negatively reinforcing (e.g., coping) drinking motives are useful predictors of alcohol use and alcohol-related problems, similar to the findings presented from among the college student population. Although this inquiry to support the importance of general college student factors in collegiate athlete alcohol use is important, it provides very limited information that might also contribute to understanding the motives associated with the higher level of drinking present in athletes. Indeed, this construct as specific to athletes has also been examined.

**Sport-specific drinking motives.** More recently, researchers have addressed the concept of sport-related drinking motives, or motives that are unique to athletes (Martens et al., 2005; Martens, LaBrie, Hummer, & Pedersen, 2008; O’Brien et al., 2008). Such motives include sport-related positive reinforcement, team/group, and sport-related coping. These three motives are assessed specifically within the context of athletics and sport participation. Positive reinforcement motive is a direct or indirect use of alcohol as a means of obtaining a pleasing reward or feeling, generally related to one’s activity as an athlete. Positive reinforcement motive is conceptually similar to enhancement motive. Team/group motive is the use of alcohol within the context of an athletic group, and is conceptually similar to social motive. Sport-related

coping is the use of alcohol to deal with sport-related problems (Martens et al., 2005), and is conceptually similar to coping motive.

Sport-related positive reinforcement motives were uniquely associated with alcohol use and with negative consequences. Positive reinforcement and sport-related coping have the strongest individual unique relationships with alcohol use, with sport-related coping showing a relationship with multiple measures of alcohol-related problems (Martens, LaBrie, et al., 2008). Team/group motive was not uniquely associated with alcohol outcomes (Martens et al., 2005).

Athlete-specific motives are identifiable from other general college student motives. Student-athlete scores on scales measuring these motives were associated with alcohol outcomes when controlling for the effects of other types of drinking motives, such as motives measured by the DMQ-R (Martens et al., 2005; Martens, LaBrie, et al., 2008). Results also indicated that when scores on each of the sport-specific subscales were entered simultaneously into regression analyses, sport-related positive reinforcement motives were uniquely associated with both alcohol use and alcohol consequences, whereas sport-related coping was uniquely associated with alcohol consequences. In sum, athlete-specific drinking motives appear to be useful predictors of alcohol outcomes among student-athletes. One study (Martens et al., 2005) examined the incremental validity of sport-specific drinking motives in predicting alcohol outcomes above and beyond the effects of general drinking motives. Indeed, sport-related positive reinforcement and sport-related coping motives were associated with alcohol use and alcohol consequences above and beyond the effects of the general drinking motives.

A model-based examination was conducted with structural equation modeling and found that the inclusion sport-specific drinking motives resulted in an improved explanation of alcohol use and alcohol consequences above and beyond the effects of general drinking motives

(Martens, Pedersen, Smith, Stewart, & O'Brien, 2011). Both sport-related positive reinforcement motives and sport-related coping motives demonstrated a direct relationship with alcohol use and accounted for an additional 19% of the variance in the model. Sport-related positive reinforcement had a direct relationship with alcohol consequences and both sport-related motives had indirect relationships with alcohol consequences, although the increase in variance accounted for was very modest over the model that did not include sport-related drinking motives (Martens et al., 2011). Again, these findings support the validity of utilizing sport-specific drinking motives in understanding alcohol-related outcomes among student-athletes.

Only a few studies have assessed team motives for alcohol use and generally surmise that drinking is viewed by athletes as an important component of team cohesion (Zhou & Heim, 2014). Findings suggest that the relationship between general and sport-related drinking motives is not fully understood, yet athlete-specific drinking motives are useful predictors of alcohol outcomes among student-athletes. Further exploration of how athlete drinking motives may place student-athletes at risk for heavy alcohol use is warranted (Martens, Dams-O'Connor, & Beck, 2006).

### **Measurement of Drinking Motives**

There is enormous heterogeneity in the measurement of drinking motives. Researchers have developed their own multidimensional questionnaires to measure drinking motives (Bradley, Carman, & Petree, 1991; Carpenter & Hasin, 1998; Kairouz et al., 2002; Karwacki & Bradley, 1996; Labouvie & Bates, 2002; Stewart & Power, 2002; Weinberger & Bartholomew, 1996; Windle & Windle, 1996). In sum, these scales consist of up to 40 items and are grouped into between 2 and 10 dimensions (Kuntsche et al., 2005). The psychometric properties of such measures have not been established.

While there is a long history of research into motives underlying alcohol use, a small group of established scales are available and are commonly used for research purposes. These scales are the Drinking Motive Questionnaire (DMQ, Cooper et al., 1992), the Drinking Motive Questionnaire Revised (DMQ-R, Cooper, 1994), the Reasons for Drinking Questionnaire (RFDQ, Farber, Khavari, & Douglass, 1980), the Reasons for Drinking Scale (RDS, Carpenter & Hasin, 1998), and the Social Context of Drinking Scales (SCDS, Thombs, Beck, & Pleace, 1993). Among these instruments, the Drinking Motive Questionnaire, in the original form or revised form, is the most commonly used (Kuntsche et al., 2005).

Analysis of the available multidimensional questionnaires demonstrates that all studies utilized a coping dimension in conjunction with one or more other dimensions (Kuntsche et al., 2005). Social and enhancement motives were also frequently included in the scales, providing justification of the salience of these motive categories among researchers. The Drinking Motive Questionnaire Revised (DMQ-R) assessed each of these motive areas in addition to assessing the drinking motive of conformity, as it was developed and based on a specific model of alcohol use (i.e., the Motivational Model of Alcohol use; Cox & Klinger, 1988). Furthermore, the DMQ-R has been psychometrically confirmed in different samples, including college students and collegiate athletes (MacLean & Lecci, 2000; Martens, Rocha, et al., 2008; Stewart, et al., 2001).

The DMQ-R four-factor model was tested for its psychometric fit in a sample of college athletes, results indicated that its fit was less adequate compared to a three-factor model that excluded the conformity subscale (Martens, Cox, Beck, & Heppner, 2003). The conformity subscale may not be as applicable to a college student population as it was originally validated in an adolescent sample with ages ranging from 13 to 17 years old, indicating that conformity may not be as meaningful for college student drinking as it is during the high school adolescent years.

The modified three-factor DMQ-R model has acceptable construct validity, internal consistency, and convergent validity among intercollegiate athletes (Martens, Cox, Beck & Heppner, 2003).

**Sport-specific measures.** Currently there is only one scale that has been psychometrically developed to measure drinking motives specific to athletes, the Athlete Drinking Scale (ADS; Martens et al., 2005; Martens, LaBrie, et al., 2008). The ADS has demonstrated adequate convergent and concurrent validity with measures of drinking and general drinking motives (Martens, LaBrie, et al., 2008), and specifically in samples of collegiate athletes. This scale measures the three drinking motives specific to athletes outlined in the previous section. Athlete-specific drinking motives are more salient during the competitive season (Martens & Martin, 2010), suggesting drinking motives measurement should occur during the season of competition, as proposed in this study.

Previous research findings suggest that the best way to conceptualize reasons for athlete alcohol use is a combination of general college student drinking motives, which are likely similar across the entire population of college students, and factors that are related specifically to the sport experience and environment (Martens et al., 2005).

### **Significance of Examining Drinking Motives**

Relatively few studies have assessed predictors of alcohol-related outcomes among athletes (Martens, Dams-O'Connor, et al., 2006). Even fewer have examined the relationship between drinking motives and alcohol-related outcomes among college athletes (e.g., Martens, Cox, & Beck, 2003; Martens, Cox, Beck & Heppner, 2003; Martens et al., 2011; O'Brien et al., 2008). One important area for further exploration and clarification is the use of general drinking motives and sport-related drinking motives in predicting athlete alcohol use and alcohol-related problems.

Additionally, there is an identified need for further research into team-related factors in the context of student-athlete's drinking (Martens, Dams-O'Connor, et al., 2006), and an examination of the relationship between individual and group-level drinking motivations and alcohol outcomes is warranted (Zhou & Heim, 2014). Homogenous risk groups should be targeted with specific prevention approaches tailored to their needs and deficits (Kuntsche & Gmel, 2004) and drinking motives are of particular importance in this respect as they are the most proximal antecedent of alcohol use (Cooper, 1994; Cox & Klinger, 1988; Kuntsche et al., 2005). Such investigations will increase the understanding of the role of alcohol in shaping the social lives of student-athletes (Zhou & Heim, 2014).

## Chapter 3: Methods

### Participants

Participant data was previously collected at approximately mid-season in the spring of 2014 and was funded by the Graduate Student Research Grant from the National Collegiate Athletics Association Sport Science Institute. This data has not been previously published.

Because contextual variables may impact alcohol use, a single sport was investigated: softball. This sport was selected for several reasons. First, investigations included in this study depend on nested data based on team membership, thus it is imperative to select a sport that has an adequate number of student-athletes on each team. Softball teams typically have over ten student-athletes making the team size adequate for this study. Second, softball teams have moderate to high drinking rates compared to other female sports (NCAA, 2014). Lastly, the softball competitive season occurs in the spring, which aligned with the data collection period per the funding cycle of the grant.

Participants included 721 softball female student-athletes on 62 NCAA softball teams from across the nation (see Table 1, which includes demographics information on the full sample, and the sample randomly split in half for statistical analyses further described in the Data Analyses section). Inclusionary criteria included being 18 years of age or older and current status as a student-athlete on their respective university's softball roster. Additionally, participants that reported they had never consumed alcohol ( $n = 176$ ) were excluded from the analyses in this study (original sample size was 897), consistent with past research on athlete drinking motives (Martens, Cox, Beck, & Heppner, 2003).

Of the student-athletes included in this study, 621 (86.1%) self-identified as European American, 44 (6.1%) as Latin American, 21 (2.9%) as multi-ethnic, 17 (2.5%) as other, 9 (1.2%)

as African American, and 9 (1.2%) as Asian American. The ethnic categories represented in this sample are similar to the 2013 to 2014 NCAA softball student-athlete ethnicity data (NCAA, 2015). This sample was comparatively comprised of approximately 2% more student-athletes that self-identified as Caucasian, 1.4% less identifying as African American, and 1.2% less identifying in the “other” category. All other categories differed by less than 1%.

Average age of the participants was 19.97 years ( $SD = 1.22$  years, range = 18 to 23 years). The mean number of years of experience playing softball was 12.17 years ( $SD = 3.91$  years, range = 1 to 20 years). The mean of years playing softball on their current team was 2.24 years ( $SD = 1.08$  years, range = 1 to 5 years). Of the 721 participants that reported using alcohol in their lifetime, the mean age of drinking onset was 17.72 years ( $SD = 1.55$  years, range = 9 to 21 years). Sixty-eight percent (490) drank alcohol on at least one occasion in the previous 30 days and 51% (368) binge drank on at least one occasion in the previous 30 days.

The participants represented all three NCAA divisions with 116 (16%) Division I athletes, 249 (35%) Division II athletes, and 356 (49%) Division III athletes. Student-athletes represented 62 teams from across the country, 12 (19%) were from NCAA Division I, 18 (29%) from Division II, and 32 (52%) from Division III. The distribution of athletes across divisions within this sample is skewed with a higher representation of teams in Divisions III and less of a representation of teams within Division I, compared to the number of softball teams in each NCAA division. Approximately 10% fewer teams from Division I, less than 1% more teams from Division II, and 9% more teams from Division III participated in this study, compared to the number of softball teams within each division in 2013 (NCAA, 2013). However, such direct comparisons are rough, at best. Direct comparisons of the number of student-athletes by division is not possible as NCAA data is not made available regarding the number of athletes within each



division at any given time point. Regardless, it is promising that the representation of teams per division is within a 10% for each division.

As stated, 176 participants reported that they have never used alcohol and thus were excluded from analyses. The 176 lifetime abstainers represent 19.6% of the sample, which is a rate similar to the number of student-athletes reporting that they never used alcohol in the most recent NCAA survey (16.2%; NCAA, 2013), although the comparison is not exact as the NCAA data include all sport-types.

Table 1

*Participant Demographics*

Variable	Samples		
	1	2	Full
Age (years)	19.94 (1.22)	19.99 (1.23)	19.97 (1.22)
Division (%)			
Division I	17.5	14.7	16.1
Division II	31.9	37.1	34.5
Division III	50.6	48.2	49.3
Ethnicity (%)			
European American	83.3	88.9	86.1
Latin American	7.5	4.7	6.1
Multi-ethnic	3.6	2.2	2.5
Other	2.6	2.2	1.2
African American	1.9	0.6	1.2
Asian American	1.1	1.4	1.2
Total	360	361	721

*Note.* Standard deviations in parentheses.

## Measures

After study consent was obtained electronically, all questionnaires and other measures were completed on the online survey system software (Qualtrics). All participants completed a

demographics questionnaire with information about their age, ethnicity, year in school, and age of onset for alcohol use.

Alcohol and binge drinking frequency questions were adapted from two large-scale survey instruments that assess alcohol use: the 2012-2013 NCAA National Study of Substance Use Habits of College Student-Athletes questionnaire which is a nationwide study of college student-athlete experiences with alcohol and other drugs (NCAA, 2012), and the Core Institute alcohol and drug survey which is a federally funded service to document college students' alcohol and drug use and constitutes the largest database on alcohol at post-secondary educational institutions (CORE Institute, 2015). Binge drinking was defined as consuming four or more drinks at a time, a commonly used binge drinking measure in college student females (Meilman, Cashin, McKillip, & Presley, 1998). Specifically, questions assessed the frequency of alcohol use and the frequency of binge drinking in the previous 30 days, and the typical frequency of alcohol use and binge drinking in a 30-day period in the off-season. To address high levels of skewness and consistent with previous research (Zamboanga & Ham, 2008), participants' responses to the frequency of both alcohol use and binge drinking in the previous 30 days were converted to a 5-point scale (1 = *never*, 2 = *1 to 2 days*, 3 = *3 days*, 4 = *4 days*, and 5 = *5 or more days*).

Participant drinking motives were assessed using two measures. The Motivational Model of Alcohol Use (Cox & Klinger, 1988) stipulates a four-dimensional model of drinking motives according to the valence (positive or negative) and source (internal or external) of the outcomes individuals expect to achieve by drinking. The Drinking Motive Questionnaire-Revised (DMQ-R) was created based on this model (Cooper, 1994) and is the most frequently used and validated questionnaire on this topic (Kuntshe, 2005; MacLean & Lecci, 2000; Martens, Rocha, et al.,

2008). The scale includes 20 items with 5 items measuring each of four motive categories: Social (e.g., “To celebrate special occasions with friends”), Enhancement (e.g., “Because it gives you a pleasant feeling”), Conformity (e.g., “Because your friends pressure you to drink”), and Coping (e.g., “To forget about your problems”). Participants are asked, “Thinking of all the times you drink, how often would you say that you drink for each of the following reasons.” Response options are on a five-point scale ranging from 1 (*almost never/never*) to 5 (*almost always/always*). Responses are averaged to create a score for each subscale. The scale has good factorial validity and acceptable predictive validity for alcohol consumption and alcohol-related problems and in college students (Cooper et al., 1992; MacLean & Lecci, 2000; Martens, Rocha, et al., 2008). For collegiate athletes, this measure has adequate construct validity and internal consistency (Social, Enhancement, and Coping; Martens, Cox, Beck, & Heppner, 2003).

The second measure of drinking motives is the Athlete Drinking Scale (ADS; Martens et al., 2005; Martens, LaBrie, et al., 2008) that assessed sport-related drinking motives. Athlete-specific drinking motives help explain alcohol use beyond that of the general drinking motives useful for college students. The ADS is a 19-item scale that asks participants how much they agree with the items on a scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). It contains three subscales relevant to intercollegiate athletes: Positive Reinforcement (9 items; e.g., “After a game it is important for me to go out and celebrate with alcohol”), Team/Group (7 items; e.g., “I drink to ‘fit in’ with my teammates”), and Sport-Related Coping (3 items; e.g., “I drink to help me deal with poor performances”). The ADS is associated with multiple alcohol use and negative consequence measures demonstrating support for its construct validity (Martens et al., 2005; Martens, LaBrie, et al., 2008) and factorial validity for use with intercollegiate

athletes (Martens & Martin, 2010). It also has adequate concurrent validity with measures of general drinking motives (Martens, LaBrie, et al., 2008).

Problems experienced as a result of drinking alcohol were assessed using the Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989). The RAPI is a 23-item measure of both consequences more frequently present in college student populations (e.g., missing class, inability to complete schoolwork, going to school drunk), and other general consequences (e.g., tolerance, withdrawal, physical dependence). Response options range from 0 (*never*) to 4 (*more than 10 times*), and assess the extent to which participants' have experienced each negative consequence due to alcohol use in the previous 12 months. Item responses are summed and averaged for a single total score. This scale has been recommended for use with collegiate athletes to measure negative alcohol-related consequences (Martens, Watson, et al., 2006). The RAPI is a valid measure of alcohol-related problems (White & Labouvie, 1989), has good internal consistency (Neal & Carey, 2004), test-retest reliability (Miller, Neal, et al., 2002), and has been correlated significantly with several drinking variables (White & Labouvie, 1989).

### **Design and Procedure**

The university's Institutional Review Board approved this research study. Softball head coaches ( $N = 990$ ) at NCAA institutions were contacted by email early in the softball season requesting permission for their team to participate in the study. Eighty-five head coaches (8.6%) expressed interest in study participation and 63 head coaches (6.4%) ultimately facilitated the participation of their team of athletes in this study. If the head coach agreed to participate, each athlete on their team was emailed an electronic survey link through the online survey system, which could then be completed in private and at their convenience. A total of 1,210 athletes were sent a survey link and 897 completed the survey, for a response rate of 74%. Team response rate

percentages ranged from 17% to 100% ( $M = 79\%$ ) of the team completing the survey. Student-athlete participants were also eligible to enter a drawing for a \$20 gift card upon completion of the questionnaire.

All data collection occurred exclusively during the competitive season for several reasons. First, athlete-specific motives are more salient during the competitive season (Martens & Martin, 2010). Second, athletic performance may be impaired by alcohol use and may result in higher incidences of injury (Wechsler et al., 2002), indicating that in-season alcohol use is riskier for the athletes.

## **Chapter 4: Data Analyses**

The data analyses investigate several foci. First, the measures assessing drinking motives (DMQ-R and ADS) underwent analyses on their adequacy of fit with the current sample. Next, the influence of drinking motives on alcohol use variables, including consumption, binge alcohol use, and negative alcohol-related consequences were investigated. One variable of particular interest was the team itself, thus the nested structure of the data was investigated to determine potential differences in drinking motives between teams. Lastly, the data was examined to determine whether athlete drinking motives clusters were present and how these clusters may be associated with alcohol outcome variables.

The retrospective data was obtained online (Qualtrics) and subsequently downloaded and analyzed using SPSS, unless otherwise stated.

### **Hypotheses**

Before presenting the statistical analyses, the research questions (RQs) and hypotheses are listed:

RQ1: Do the measures of drinking motives (DMQ-R and ADS) adequately fit this sample?

Hypotheses: The DMQ-R has been tested in numerous studies which have provided support for the measure's factorial validity in college student, as well as athlete, samples. Although these studies included samples with a variety of sports, because the findings were robust across studies and samples, it is expected that the DMQ-R will have adequate fit for the data in this sample. The ADS was the focus of several research articles that conducted an exploratory factor analysis (Martens et al., 2005) and confirmed the factor structure on a second sample (Martens, Labrie, et al., 2008). There were similarities among the two samples utilized, primarily in the restriction to Division I athletes. Like the studies with

the DMQ-R, a variety of sports were included in the samples. Due to less robust findings and fewer studies assessing this measure, it is less likely that this measure will have adequate fit for the current sample, however, there is no theoretical evidence to support any hypotheses about how the fit with the current sample may differ from previous findings. Thus, it is still predicted that the factor structure of the ADS will have adequate fit in this sample.

RQ2: What is the relationship between drinking motives and alcohol outcomes (consumption, binge drinking, and negative consequences) and which motives are most salient for athletes?

Hypotheses: Significant between group differences in the dependent variables are expected, and thus multilevel modeling is the most appropriate technique in order to account for data nested within teams. It is hypothesized that all seven drinking motives subscales will be associated with both alcohol consumption and binge drinking. In regards to negative consequences of alcohol use, it is expected that the coping motives will predict negative alcohol-related consequences. It is predicted that athlete-specific motives of Positive Reinforcement and Team will be most highly endorsed in athletes because these motives are both positively reinforcing and perhaps more descriptive of the athlete experience, compared to the general drinking motives.

RQ3: Are drinking motives influenced by the team?

Hypothesis: Several of the hypothesized drinking motives are socially oriented (i.e., DMQ-R social motives subscale and conformity motives subscale; ADS team motives subscale) and, consequently, would be expected to be influenced by the immediate social group of the athlete. It is predicted that drinking motives, and therefore alcohol outcomes, vary

between teams which would be evidenced by significant between-team variance in the drinking motives multilevel model of alcohol outcomes.

RQ4: Are there athlete drinking motive clusters? Do these clusters predict alcohol outcomes?

Hypotheses: This analysis is exploratory in nature and, thus, it is difficult to hypothesize cluster memberships. However, several gross hypotheses can be formed based on drinking motives theory. First, seven clusters may form which correspond to the seven drinking motives subscales across the DMQ-R and ADS. Second, the clusters may form based on underlying positive (social, enhancement, and positive reinforcement) or negative reinforcement (conformity, coping, and sport-related coping). Third, the clusters may form based on whether they are internally (enhancement, positive reinforcement, coping, and sport-related coping) or externally generated motives (social and conformity).

### **Factorial Validity of Drinking Motives**

To address RQ1, analyses were conducted to establish the internal factor structure of the drinking motives scales (DMQ-R and ADS) using CFA and to determine the internal consistency reliabilities of the subscales. To accomplish this, the sample was randomly split into two halves ( $n = 360$ ;  $n = 361$ ) for an initial CFA on one half and a second CFA to confirm the structure on the other half (Reis & Judd, 2000). The demographic characteristics of both samples (Sample 1 and Sample 2) are available in Table 1. The DMQ-R and ADS were examined separately. Several global indices of fit were used to evaluate the measurement including: Satorra-Bentler scaled  $\chi^2$ , non-normed fit index (NNFI), comparative fit index (CFI), standardized root mean-square residual (SRMR), and root mean-square error of approximation (RMSEA). Although  $\chi^2$  is used as an indicator of model fit, the test typically results in a lack of fit in larger sample sizes. Conventional CFI values of .90 or higher, SRMR values of .08 or lower, and RMSEA cut-off



value close to .06 or an upper limit of .07 (Steiger, 2007) are indicative of acceptable model fit (Hu & Bentler, 1999).

**DMQ-R.** A CFA with Robust ML estimation procedures because of non-normality in the data (multivariate kurtosis normalized estimate = 51.59) with all factors allowed to correlate was conducted with Sample 1. The measurement model for the DMQ-R provided adequate fit to the current sample (see Figure 1). One case was removed from this analysis due to missing data ( $n = 360$ ). The Satorra-Bentler scaled  $\chi^2$ , and robust fit indices and standard errors were examined: Sattora-Bentler scales  $\chi^2 (164) = 481.31, p < .001, NNFI = .91, CFI = .93, SRMR = .09, RMSEA = .07$ . Next, the model was cross validated on Sample 2 (see Figure 2) with a CFA with Robust ML estimation procedures because of non-normality in the data (multivariate kurtosis normalized estimate = 38.70) with all factors allowed to correlate. Adequate fit was demonstrated: Sattora-Bentler scales  $\chi^2 (164) = 500.74, p < .001, NNFI = .91, CFI = .92, SRMR = .09, RMSEA = .08$ . The internal consistency reliabilities (Cronbach's Alpha) on the full sample ( $N = 721$ ) ranged from .84 (Coping) to .91 (Social).

As predicted, the DMQ-R adequately fits the current sample as evidenced by adequate fit in Sample 1 and confirmed in Sample 2. Furthermore, the internal consistency reliabilities for the DMQ-R subscales ranged from good to excellent.

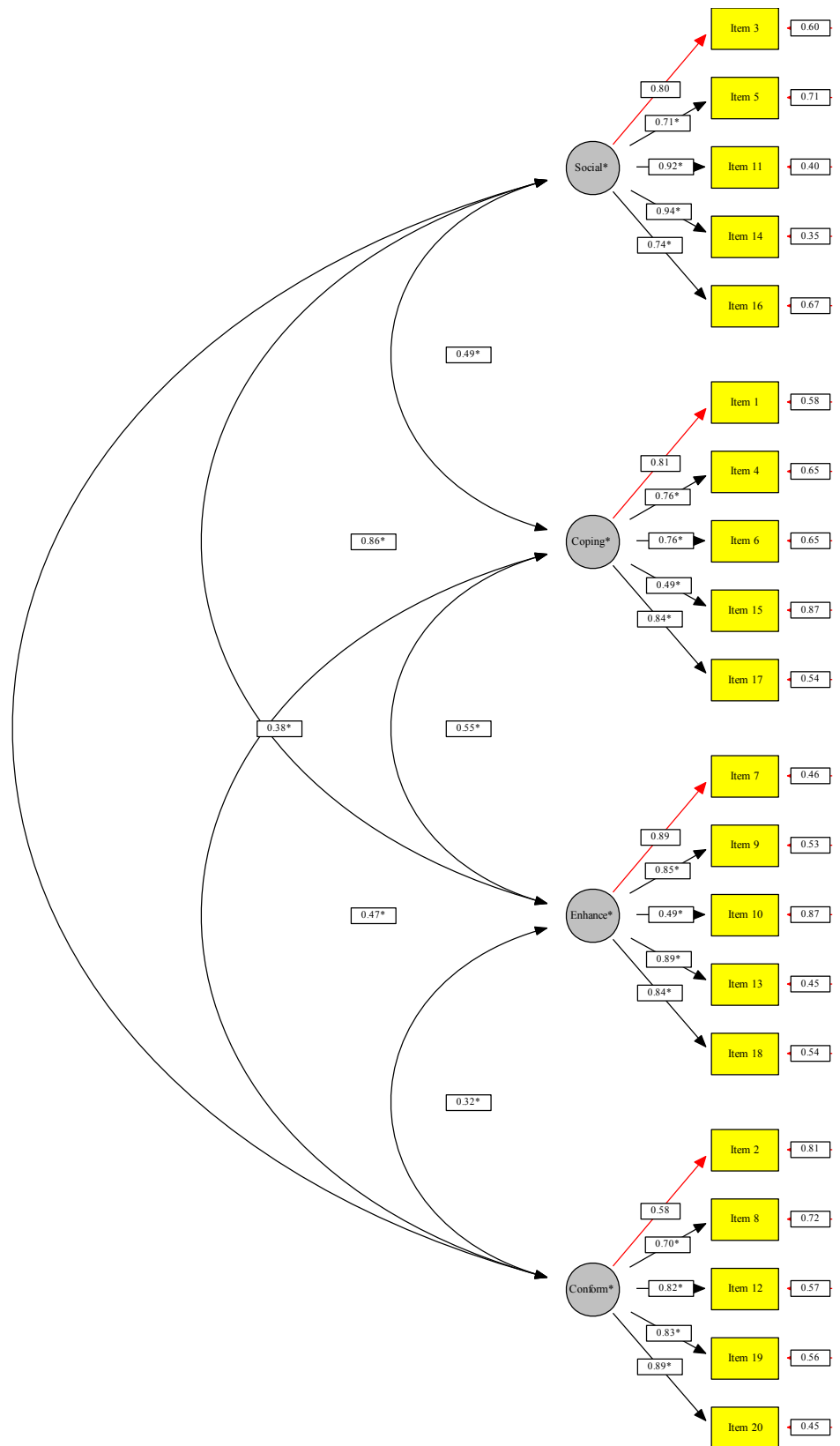


Figure 1. CFA Model for DMQ-R in Sample 1

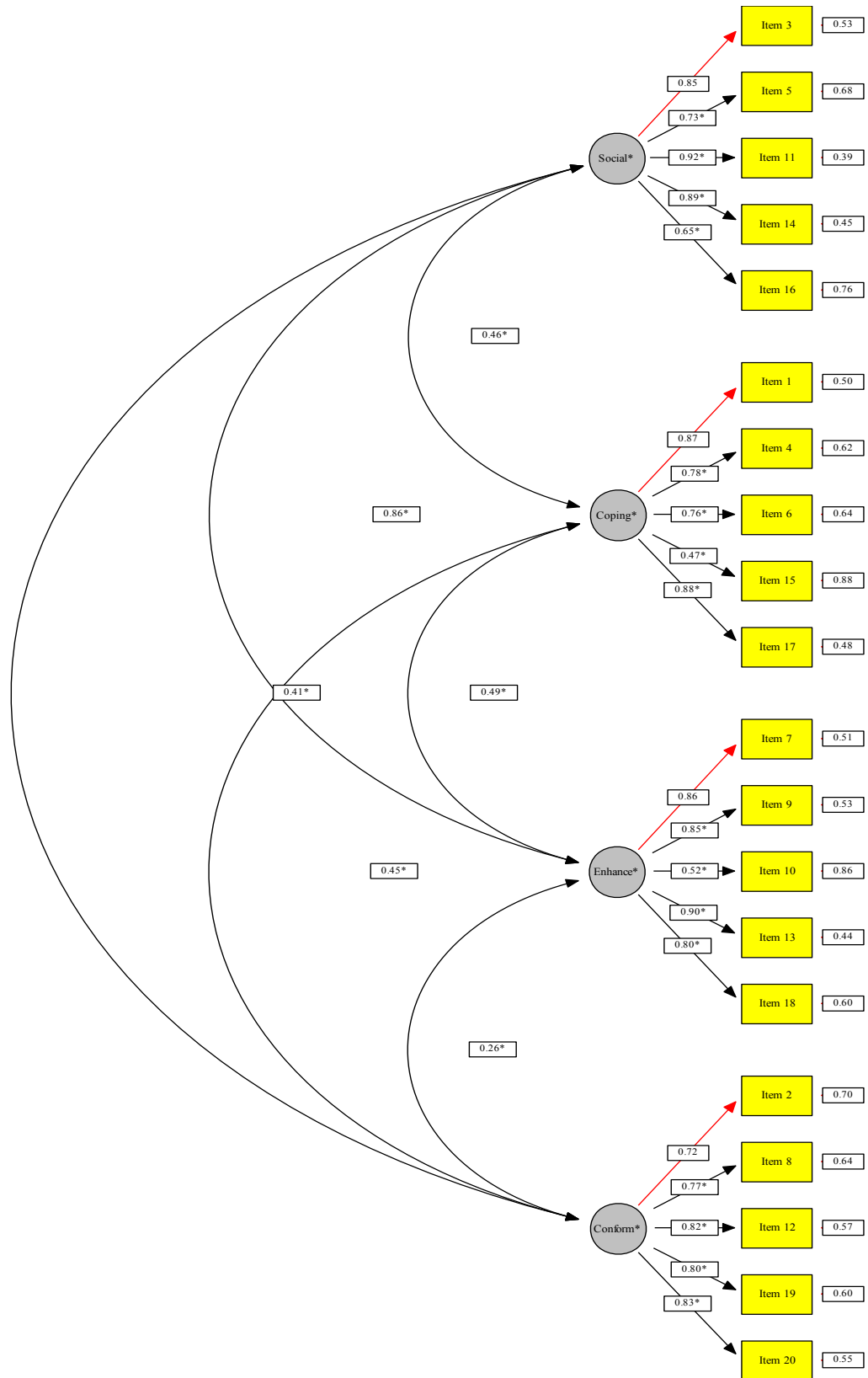


Figure 2. CFA Model for DMQ-R in Sample 2

**ADS.** A full model CFA with Robust ML estimation procedures (multivariate kurtosis normalized estimate = 37.01) with all 19 items and 3 factors was initially examined on Sample 1. This model resulted in an inadequate model fit:  $\chi^2 (149) = 607.74, p < .001, NNFI = .85, CFI = .87, SRMR = .08, RMSEA = .09$ . The internal consistency reliabilities (Cronbach's Alpha) on the full sample ( $N = 721$ ) ranged from .73 (Sport-Related Coping) to .91 (Positive Reinforcement).

The factor structure of the ADS was examined with an exploratory factor analysis (EFA) on sample 1 (half of the sample,  $n = 360$ ). Principal axis factoring extraction and oblique rotation was utilized. KMO (.90) and Bartlett's Test ( $p < .001$ ) met minimum standards for suitability for factor analysis. Examination of eigenvalues greater than 1.0, Scree plot, and theory substantiated three factors, with the first factor composed of items from positive reinforcement subscale, the second factor composed of items from the team/group subscale, and the third factor composed of items from the sport-related coping factor.

Communalities were examined and all remained under .80 (Table 2). Items 16, 17, and 12 from Factor 2 had loadings of .37, .34, and .37 on that factor, and cross-loaded onto Factor 1 with loadings of .61, .51, and .44. These three items were subsequently dropped, resulting in four items remaining on that factor which was renamed Team. All item loadings exceeded the minimum of .32 with the lowest loading at .36 (item 7 from Factor 2). The three factors accounted for 64% of the variance in the model. A CFA with Robust ML estimation procedures because of non-normality in the data (multivariate kurtosis normalized estimate = 34.74) with all factors allowed to correlate resulted in a final measurement model (see Figure 3) for the ADS in Sample 2 that included 16 items and 3 factors: Sattora-Bentler scales  $\chi^2 (101) = 346.46, p < .001, NNFI = .89, CFI = .91, SRMR = .07, RMSEA = .08$ .

Contrary to predictions, the ADS did not adequately fit the current sample. However, after conducting an EFA with Sample 1 and confirming the revised structure on Sample 2, the ADS provides an adequate fit to the data. Furthermore, the internal consistency reliability of the ADS subscales ranged from acceptable to excellent.

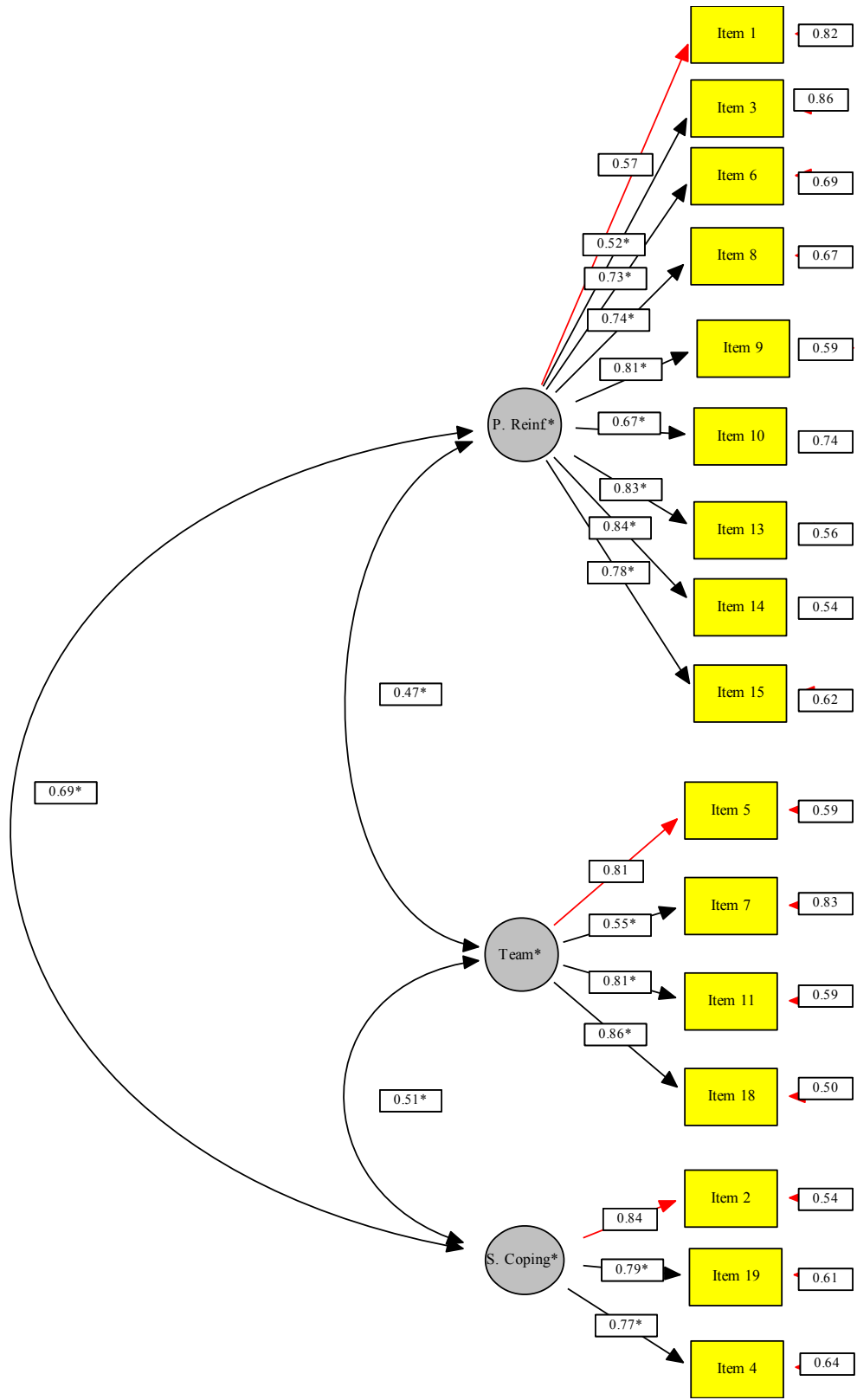


Figure 3. CFA Model for ADS in Sample 2

Table 2

*Exploratory Factor Analysis Pattern Factor Loadings for Athlete Drinking Scale in Sample 1 (n = 360)*

Item		Factor			h <sup>2</sup>
		1	2	3	
9	I drink to celebrate athletic victories	<b>.84</b>	-.01	.02	.68
14	Winning or performing well is a good reason to go out and drink	<b>.83</b>	.02	-.02	.71
13	If I've performed well, I feel like I can go out and drink a little more than usual	<b>.74</b>	.05	-.10	.67
8	Because I work so hard at my sport, I should be able to drink and have a good time	<b>.73</b>	.02	-.06	.59
10	I get a rush out of becoming drunk	<b>.67</b>	-.02	.01	.44
15	I drink because I believe in the "work hard-play hard" lifestyle	<b>.66</b>	.11	-.09	.58
1	I enjoy the feeling of getting drunk	<b>.66</b>	-.13	-.01	.40
3	I drink to have a good time with my teammates	<b>.63</b>	.02	.09	.35
6	After a game/match/meet, it is important for me to go out and celebrate with alcohol	<b>.56</b>	.15	-.17	.55
18	I drink because my teammates expect me to drink with them	.14	<b>.80</b>	.06	.68
11	I feel pressure from my teammates to drink alcohol	-.05	<b>.80</b>	.09	.58
5	I drink to "fit in" with my teammates	-.05	<b>.69</b>	-.11	.52
7	When drinking alcohol with teammates, it becomes a competition	.08	<b>.36</b>	-.25	.30
2	I drink to help me deal with poor performances	-.01	-.05	<b>-.83</b>	.67
4	I drink to deal with sport-related stress	.04	-.04	<b>-.79</b>	.65
19	I tend to drink more when I'm not performing well athletically	.08	.11	<b>-.69</b>	.61

*Note.* h<sup>2</sup> = communality. Salient factor pattern matrix coefficients are in boldface. Factor 1 = Positive Reinforcement. Factor 2 = Team. Factor 3 = Sport-Related Coping.

### Drinking Motives and Alcohol Use and Consequences

To answer RQ2, three separate multilevel model analyses were conducted using HLM 6 Hierarchical Linear and Nonlinear Modeling software: motives subscales predicting alcohol use, motives subscales predicting binge drinking, and motives subscales predicting negative alcohol-related consequences. Additionally, means were examined to provide insights into which motives were most endorsed.

Model building for each multilevel analysis involved three steps. First, an unconditional model was imposed with no Level-1 or Level-2 predictors. Second, the Level-1 model was formed where the individual level parameters could vary or remain fixed at Level-2. Third,

Level-2 variables were entered to predict individual level parameters. The primary purpose of fitting the unconditional model was to determine the amount of variation in alcohol consumption that existed between teams (ICC).

**Preliminary analyses.** The relationships among demographic variables, drinking motives, and outcome variables were examined with correlations (Table 3). Additionally, a multivariate analysis of variance (MANOVA) was utilized to examine the relationships between the division and the seven drinking motives subscales, alcohol use days, binge drinking days, and the RAPI. This analysis revealed significant multivariate effects of division,  $F(20, 1414) = 4.16$ ,  $p < .001$ ; Wilks'  $\lambda = 0.89$ , partial  $\eta^2 = 0.56$ , based on alcohol days, binge drinking days, and drinking motives (Social, Enhancement, Coping, Sport-Related Coping, with Positive Reinforcement approaching significance). Based on these preliminary analyses, age of onset and division will be added to the model to control for their effects.

Social ( $M = 3.00$ ,  $SD = 1.08$ ) and Enhancement ( $M = 2.54$ ,  $SD = 1.05$ ) motives were the most endorsed motives from the DMQ-R, with participants reporting they drink approximately “half of the time” for these reasons. Positive Reinforcement motive ( $M = 2.96$ ,  $SD = 1.07$ ) was the most endorsed motive from the ADS, with participants reporting they “slightly disagree” that they drink to enhance an already positive sport-related experience. This pattern indicates that participants most highly endorsed motives based on positive reinforcement compared to negative reinforcement. Consistent with expectations Positive Reinforcement was a more endorsed motive, and Team motive did not appear to be as endorsed as had been expected. Instead, Social and Enhancement were more endorsed, relative to other motives, which match the prediction that more positively reinforcing motives would be more endorsed by participants compared to negatively reinforcing motives.



Table 3

Means, Standard Deviations, and Correlations Among Demographic, Drinking Motive, and Outcome Variables ( $N = 721$ )

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	19.97	1.22	-											
2. Alcohol Onset	17.72	1.55	.28*	-										
3. Social	3.00	1.08	.08 <sup>+</sup>	-.19*	<i>.91</i>									
4. Coping	1.91	0.86	.03	-.17*	<i>.53*</i>	<i>.84</i>								
5. Enhancement	2.54	1.05	-.01	-.28*	<i>.78*</i>	<i>.57*</i>	<i>.89</i>							
6. Conformity	1.48	0.70	-.04	-.02	<i>.36*</i>	<i>.43*</i>	<i>.26*</i>	<i>.88</i>						
7. Pos. Reinforcement	2.96	1.07	.07	-.23*	<i>.62*</i>	<i>.47*</i>	<i>.67*</i>	<i>.28*</i>	<i>.91</i>					
8. Team	1.95	0.94	-.08 <sup>+</sup>	.01	<i>.23*</i>	<i>.26*</i>	<i>.15*</i>	<i>.68*</i>	<i>.40*</i>	<i>.81</i>				
9. Sport-Related Coping	2.06	1.08	.09 <sup>+</sup>	-.14*	<i>.31*</i>	<i>.62*</i>	<i>.33*</i>	<i>.33*</i>	<i>.59*</i>	<i>.42*</i>	<i>.73</i>			
10. Alcohol Days	2.56	1.51	.18*	-.15*	<i>.32*</i>	<i>.23*</i>	<i>.35*</i>	<i>.04</i>	<i>.48*</i>	<i>.07</i>	<i>.29*</i>	-		
11. Binge Days	1.92	1.22	.06	-.19*	<i>.34*</i>	<i>.28*</i>	<i>.41*</i>	<i>.10*</i>	<i>.51*</i>	<i>.13*</i>	<i>.30*</i>	<i>.73*</i>	-	
12. RAPI	4.73	7.12	.03	-.28*	<i>.30*</i>	<i>.44*</i>	<i>.41*</i>	<i>.29*</i>	<i>.42*</i>	<i>.18*</i>	<i>.41*</i>	<i>.34*</i>	<i>.38*</i>	<i>.92</i>

Note. +  $p < .05$ . \*  $p < .01$ , 2-tailed. Internal consistency values are in italics.

**Multilevel model for alcohol use.** Results from the unconditional model revealed that there was a significant amount of variance in alcohol use between teams ( $u_0 = 0.59$ ,  $\chi^2 = 297.48$ ,  $p < .001$ ). Specifically, the ICC was .26, which indicated that 26% of the variance in athlete alcohol use was due to between-team differences, whereas 74% of the variance was due to within-team differences. The full multilevel model for alcohol use is presented in Table 4. Accounting for athlete age of onset of alcohol use and NCAA division, Social motives ( $\gamma = 0.19$ ,  $SE = 0.06$ ,  $t = 3.02$ ,  $p < .01$ ) and Positive Reinforcement motives ( $\gamma = 0.47$ ,  $SE = 0.08$ ,  $t = 5.78$ ,  $p < .001$ ) emerged as significant and positive predictors of alcohol use, while Conformity motive was a significant and negative predictor ( $\gamma = -0.24$ ,  $SE = 0.08$ ,  $t = -2.82$ ,  $p < .01$ ). That is, the higher Social and Positive Reinforcement motives reported by athletes, the more days they consumed alcohol, and the higher Conformity motive reported by athletes, the fewer days they

consumed alcohol. Coping, Enhancement, Team, and Sport-Related Coping motives were all unrelated to alcohol use, however Team was trending toward significance ( $\gamma = -0.13$ ,  $SE = 0.07$ ,  $t = -1.80$ ,  $p = .07$ ). Division II ( $\gamma = 0.50$ ,  $SE = 0.17$ ,  $t = 3.01$ ,  $p < .01$ ) and Division III ( $\gamma = 0.81$ ,  $SE = 0.19$ ,  $t = 4.24$ ,  $p < .001$ ) athletes reported more alcohol use compared to Division I athletes. The age at which an athlete began drinking alcohol was trending toward significance ( $\gamma = -0.06$ ,  $SE = 0.03$ ,  $t = -1.82$ ,  $p = .07$ ), with the younger an athlete began regularly drinking alcohol the more the athlete reported drinking alcohol currently.

Contrary to prediction, only some of the drinking motives predicted alcohol use, namely Social, Conformity, and Positive Reinforcement. Indicating that higher Social and Positive Reinforcement motives were associated with more alcohol use. In contrast, higher Conformity motives is associated with less alcohol use, a relationship that was predicted to be positive rather than inverse.

Table 4

*Multilevel Model for Alcohol Use (N = 721)*

Fixed Effect	Coefficient	SE	t
Intercept	2.01	0.11	18.60***
Division II	0.50	0.17	3.01**
Division III	0.81	0.19	4.24***
Age of Alcohol Onset	-0.06	0.03	-1.82
Social	0.19	0.06	3.02**
Coping	0.02	0.08	0.20
Enhancement	-0.00	0.08	-0.01
Conformity	-0.24	0.08	-2.82**
Positive Reinforcement	0.47	0.08	5.78***
Team	-0.13	0.07	-1.80
Sport-Related Coping	0.11	0.06	1.68
Random Effect	Variance Component	df	$\chi^2$
Intercept	0.55	59	349.22***
Social Slope	0.03	61	75.45
Coping Slope	0.03	61	86.42*
Level-1 effect	1.27		

Note. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Multilevel model for binge drinking.** Results from the unconditional model revealed that there was a significant amount of variance in binge drinking between teams ( $u_0 = 0.28$ ,  $\chi^2 = 218.82$ ,  $p < .001$ ). Specifically, the ICC was .19, which indicated that 19% of the variance in athlete binge drinking was due to between-team differences, whereas 81% of the variance was due to within-team differences. Table 5 presents the results of the full multilevel model for binge drinking. Accounting for athlete age of alcohol onset and NCAA division, Positive Reinforcement ( $\gamma = 0.40$ ,  $SE = 0.06$ ,  $t = 6.42$ ,  $p < .001$ ) and Enhancement ( $\gamma = 0.16$ ,  $SE = 0.06$ ,  $t = 2.67$ ,  $p < .01$ ) motives were significant positive predictors of binge drinking. That is, the higher Positive Reinforcement and Enhancement motives reported by athletes, the more days they binge

drank alcohol. Social, Coping, Conformity, Team, and Sport-Related Coping were unrelated to binge drinking. Division II ( $\gamma = 0.29$ ,  $SE = 0.12$ ,  $t = 2.52$ ,  $p < .05$ ) and Division III ( $\gamma = 0.47$ ,  $SE = 0.13$ ,  $t = 3.65$ ,  $p < .01$ ) athletes reported more binge drinking than Division I athletes. The younger an athlete began drinking the more binge drinking the athlete reported ( $\gamma = -0.06$ ,  $SE = 0.03$ ,  $t = -2.01$ ,  $p < .05$ ). Overall and contrary to predictions, only Enhancement and Positive Reinforcement motives predicted binge drinking.

Contrary to prediction, only some of the drinking motives predicted binge drinking, namely Enhancement and Positive Reinforcement. Indicating that higher Enhancement and Positive Reinforcement motives were associated with more binge drinking.

Table 5

*Multilevel Model for Binge Drinking (N = 721)*

Fixed Effect	Coefficient	SE	t
Intercept	1.59	0.08	21.09***
Division II	0.29	0.12	2.52*
Division III	0.47	0.13	3.65**
Age of Alcohol Onset	-0.06	0.03	-2.01*
Social	-0.02	0.06	-0.28
Coping	0.03	0.07	0.47
Enhancement	0.16	0.06	2.67**
Conformity	-0.07	0.07	-1.11
Positive Reinforcement	0.40	0.06	6.42***
Team	-0.07	0.06	-1.08
Sport-Related Coping	0.05	0.08	0.67
Random Effect	Variance Component	df	$\chi^2$
Intercept	0.28	59	292.78***
Social Slope	0.04	61	82.32*
Coping Slope	0.09	61	136.83***
Level-1 effect	0.81		

Note. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

**Multilevel model for negative alcohol-related consequences.** Results from the unconditional model revealed that there was a significant amount of variance in negative consequences between teams ( $u_0 = 2.51, \chi^2 = 96.54, p < .01$ ). Specifically, the ICC was .05, which indicated that 5% of the variance in athlete alcohol-related negative consequences was due to between-team differences, whereas 95% of the variance was due to within-team differences. Table 6 presents the results of the full multilevel model for negative consequences. Accounting for athlete age of alcohol onset and NCAA division, Positive Reinforcement ( $\gamma = 1.12, SE = 0.29, t = 3.87, p < .001$ ), Enhancement ( $\gamma = 1.10, SE = 0.37, t = 2.98, p < .01$ ), Conformity ( $\gamma = 1.71, SE = 0.63, t = 2.70, p < .01$ ), and Coping ( $\gamma = 0.85, SE = 0.37, t = 2.33, p < .05$ ) motives emerged as significant and positive predictors of negative consequences. Social, Team, and Sport-Related Coping were unrelated to negative consequences. Division II and Division III athletes did not report more negative consequences compared to Division I athletes. The younger an athlete began drinking the more negative alcohol-related consequences the athlete reported ( $\gamma = -0.63, SE = 0.14, t = -4.52, p < .001$ ).

The hypotheses were partially confirmed with Coping predicting negative consequences as expected, while Sport-Related Coping was unrelated to consequences. Additionally, higher Enhancement, Conformity, and Positive Reinforcement motives were associated with more negative consequences, which was not predicted in advance.

Table 6

*Multilevel Model for Negative Consequences (N = 721)*

Fixed Effect	Coefficient	SE	t
Intercept	4.38	0.52	8.45***
Division II	0.20	0.55	0.36
Division III	0.45	0.55	0.82
Age of Alcohol Onset	-0.63	0.14	-4.52***
Social	-0.45	0.32	-1.41
Coping	0.85	0.37	2.33*
Enhancement	1.10	0.37	2.98**
Conformity	1.71	0.63	2.70**
Positive Reinforcement	1.12	0.29	3.87***
Team	-0.63	0.39	-1.61
Sport-Related Coping	0.55	0.39	1.43
Random Effect	Variance Component	df	$\chi^2$
Intercept	5.08	52	202.16***
Age of Alcohol Onset Slope	0.33	54	83.63**
Social Slope	0.88	54	77.39*
Enhancement Slope	2.96	54	102.70***
Conformity Slope	11.47	54	151.65***
Team Slope	2.42	54	103.51***
Sport-Related Coping	2.48	54	100.05***
Level-1 effect	20.67		

Note. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

### Team Based Drinking Motives

Multilevel modeling was also utilized to determine whether drinking motives, and therefore alcohol outcomes, varied between teams to answer RQ3. Alcohol use, binge drinking, and negative alcohol-related consequences all significantly varied between-teams, as predicted. Between-team variance in alcohol use was 26%, binge drinking was 19%, and negative consequences was 5%, providing support for team differences in drinking motives. This suggests

that team membership may directly influence drinking motives of individual athletes.

### **Drinking Motives Groups**

A model-based clustering technique was utilized to form athlete drinking motives clusters to address RQ4. A model-based cluster analysis combines model-based hierarchical clustering, EM for Gaussian mixture models, and Bayesian Information Criterion (BIC) to determine the best model. First, one participant was deleted from this analysis due to missing data on the DMQ-R. The model-based clustering algorithm was implemented using the *mclust* package in R (Fraley & Raftery, 2002; Fraley, Raftery, Murphy, & Scrucca, 2012). The drinking motives subscales of the DMQ-R and ADS were utilized as the clustering variables. The best fitting model involved a five-cluster ellipsoidal, varying volume, shape, and orientation (VVV) solution BIC = -9,522.75, with mixing probabilities .208 ( $n = 152$ ), .060 ( $n = 45$ ), .279 ( $n = 207$ ), .371 ( $n = 256$ ), and .083 ( $n = 60$ ) in the order of Clusters 1 through 5. Initially, the best fitting model involved a seven-cluster variable orientation (VEV) model, which was deemed an overextraction of components, especially given that a high number of models were unable to converge.

The five clusters included a *moderate/typical motives* group (Cluster 1,  $n = 152$ ), characterized by means hovering around the subscale means for the whole sample with small spikes in Social motive and Positive Reinforcement motive (both commonly endorsed motives), a *low/moderate Team* motives group (Cluster 2,  $n = 45$ ), characterized by means below the subscale means for the whole sample with the exception of Team motive which was higher than the mean, *moderate motives* group (Cluster 3,  $n = 207$ ), characterized by motives means hovering around the mean for the whole sample but without spikes on any motives, a *high motives* group (Cluster 4,  $n = 256$ ), characterized by the highest means on all seven motives, and a *low motives* group (Cluster 5,  $n = 60$ ), characterized by the lowest means on all 7 drinking

motives. The means for all five clusters are available in Table 7.

Table 7

*Means of Drinking Motives, Alcohol Use, Binge Drinking, and Consequences by Cluster*

Drinking Motives	Cluster					Full Sample
	1	2	3	4	5	
Social	3.18	1.55	2.81	3.63	1.39	3.00
Coping	1.77	1.07	1.55	2.60	1.02	1.91
Enhancement	2.57	1.27	2.48	3.10	1.42	2.54
Conformity	1.28	1.28	1.00	2.08	1.03	1.48
Pos. Reinforcement	3.18	2.22	2.74	3.47	1.39	2.96
Team	1.66	2.38	1.46	2.61	1.01	1.95
Sport-Related Coping	2.10	1.59	1.50	2.78	1.00	2.06
Alcohol Use	2.80(1.54) <sup>ac</sup>	1.64(1.26) <sup>b</sup>	2.46(1.44) <sup>a</sup>	2.86(1.53) <sup>c</sup>	1.65(1.07) <sup>b</sup>	
Binge Drinking	1.92(1.16) <sup>a</sup>	1.27(0.72) <sup>b</sup>	1.81(1.09) <sup>ac</sup>	2.32(1.39) <sup>d</sup>	1.15(0.36) <sup>b</sup>	
Consequences	4.78(5.02) <sup>a</sup>	0.87(1.42) <sup>b</sup>	2.88(3.94) <sup>abc</sup>	7.86(9.77) <sup>d</sup>	0.58(1.37) <sup>bc</sup>	
N	152	45	207	256	60	720

*Note.* Within each row, means that do not share a superscript differ from each other at  $p < .05$  using Tukey's *post hoc* tests.

**Drinking motives groups correlates.** Three one-way analysis of variance (ANOVA) were conducted to evaluate the null hypothesis that there is no difference in clusters based on alcohol use, binge drinking, and negative alcohol-related consequences ( $n = 720$ ).

**Alcohol use.** The assumption of homogeneity of variance was tested using Levene's Test,  $F(4, 715) = 11.72, p < .001$ , indicating a violation of this assumption and that robust tests of equality of means should be utilized (i.e., Brown-Forsythe; Howell, 2010). The Brown-Forsythe ANOVA was significant  $F(4, 486.61) = 16.53, p < .001, \eta^2 = .08$ . Thus, there is significant evidence to reject the null hypothesis and conclude there is a significant difference in drinking motive clusters on alcohol use. A measure of strength of effect indicated that 8% of the variance



in alcohol use can be attributed to differences in drinking motives cluster membership ( $\eta^2 = .08$ ). Descriptive statistics for the drinking motives clusters are also available in Table 7.

A Tukey HSD post-hoc test (Keppel, 1991) was used to examine differences in mean alcohol use among drinking motives clusters. The differences in alcohol use were significant between clusters 1 and 2 ( $M = 1.16, p < .001$ ), 1 and 5 ( $M = 1.15, p < .001$ ), 2 and 3 ( $M = -0.81, p < .01$ ), 2 and 4 ( $M = -1.22, p < .001$ ), 3 and 4 ( $M = -0.40, p = .025$ ), 3 and 5 ( $M = 0.81, p < .01$ ), and 4 and 5 ( $M = 1.21, p < .001$ ). This information is also plotted in Figure 4.

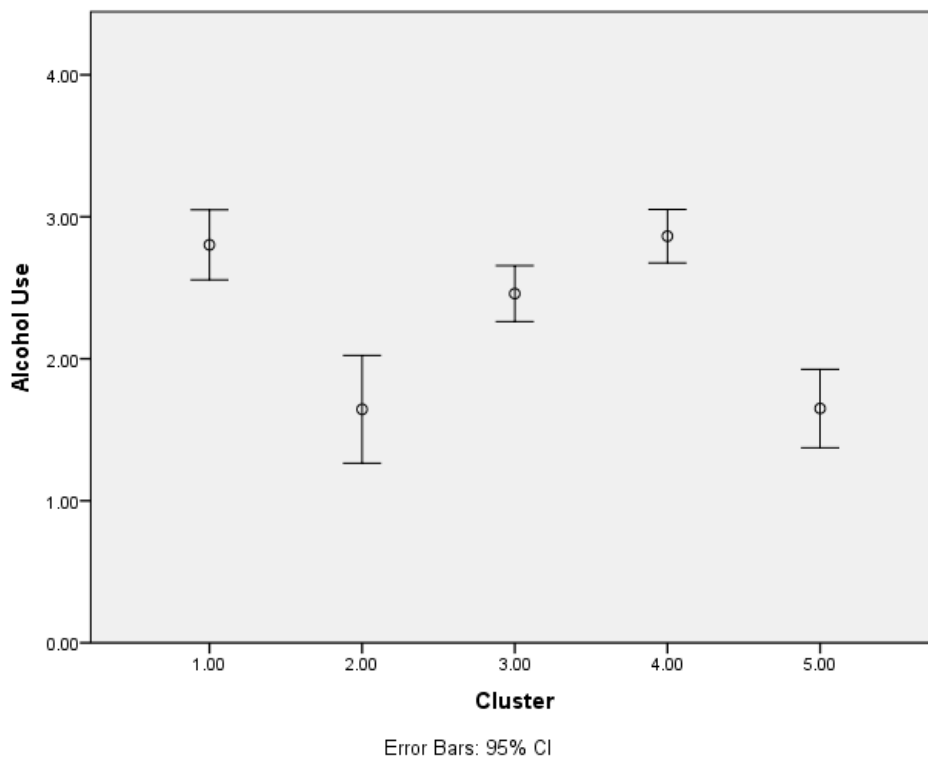


Figure 4. Alcohol Use by Cluster

**Binge drinking.** The assumption of homogeneity of variance was tested using Levene's Test,  $F(4, 715) = 24.43, p < .001$ , indicating a violation of this assumption and that robust tests of equality of means should be utilized. The Brown-Forsythe ANOVA was significant  $F(4,$

623.03) = 25.99,  $p < .001$ ,  $\eta^2 = .09$ . Thus, there is significant evidence to reject the null hypothesis and conclude there is a significant difference in drinking motive clusters based on binge drinking. A measure of strength of effect indicated that 9% of the variance in binge drinking can be attributed to differences in drinking motives cluster membership ( $\eta^2 = .09$ ). Descriptive statistics for the drinking motives clusters are available in Table 7.

A Tukey HSD post-hoc test was used to examine differences in binge drinking among drinking motives clusters. The differences in binge drinking were significant between clusters 1 and 2 ( $M = 0.65$ ,  $p = .01$ ), 1 and 4 ( $M = -0.40$ ,  $p < .01$ ), 1 and 5 ( $M = 0.76$ ,  $p < .001$ ), 2 and 3 ( $M = -0.55$ ,  $p = .04$ ), 2 and 4 ( $M = -1.05$ ,  $p < .001$ ), 3 and 4 ( $M = -0.51$ ,  $p < .001$ ), 3 and 5 ( $M = 0.66$ ,  $p < .01$ ), and 4 and 5 ( $M = 1.17$ ,  $p < .001$ ). See Figure 5.

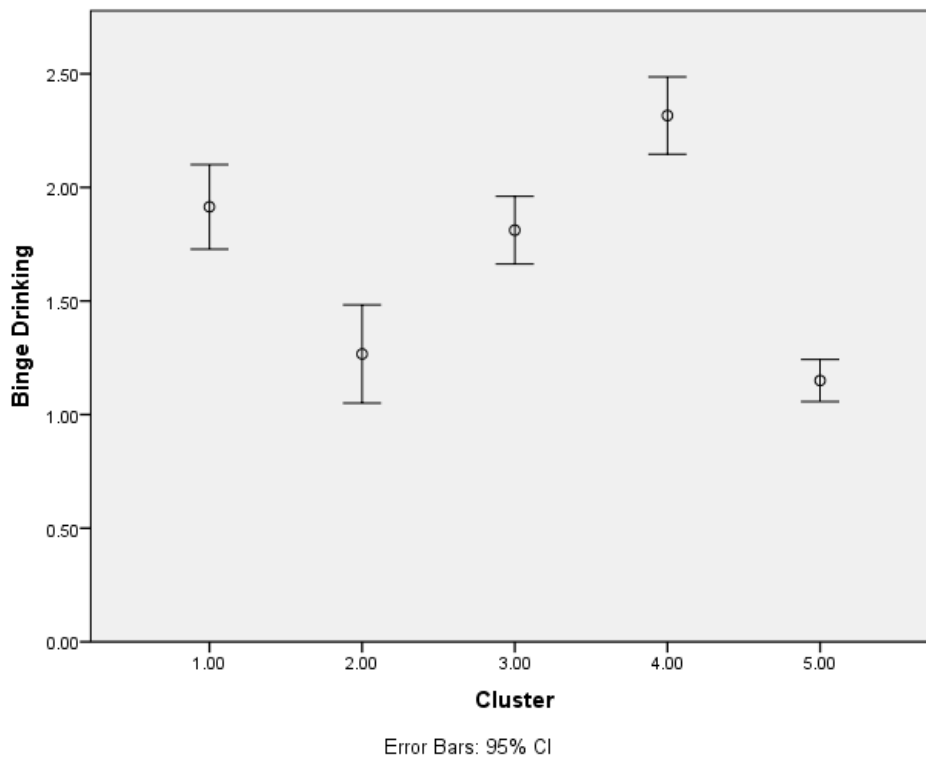


Figure 5. Binge Drinking by Cluster

*Negative alcohol-related consequences.* The assumption of homogeneity of variance was tested using Levene's Test,  $F(4, 714) = 39.59, p < .001$ , indicating a violation of this assumption and that robust tests of equality of means should be utilized. The Brown-Forsythe ANOVA was significant  $F(4, 505.38) = 51.06, p < .001, \eta^2 = .14$ . Thus, there is significant evidence to reject the null hypothesis and conclude there is a significant difference in drinking motive clusters based on binge drinking. A measure of strength of effect indicated that 14% of the variance in binge drinking can be attributed to differences in drinking motives cluster membership ( $\eta^2 = .14$ ). Descriptive statistics for the drinking motives clusters are available in Table 7.

A Tukey HSD post-hoc test was used to examine differences in mean alcohol use among drinking motives clusters. The differences in alcohol use were significant between clusters 1 and 2 ( $M = 3.91, p < .01$ ), 1 and 4 ( $M = -3.08, p < .001$ ), 1 and 5 ( $M = 4.20, p < .001$ ), 2 and 4 ( $M = -6.99, p < .001$ ), 3 and 4 ( $M = -4.98, p < .001$ ), and 4 and 5 ( $M = 7.28, p < .001$ ). See Figure 6.

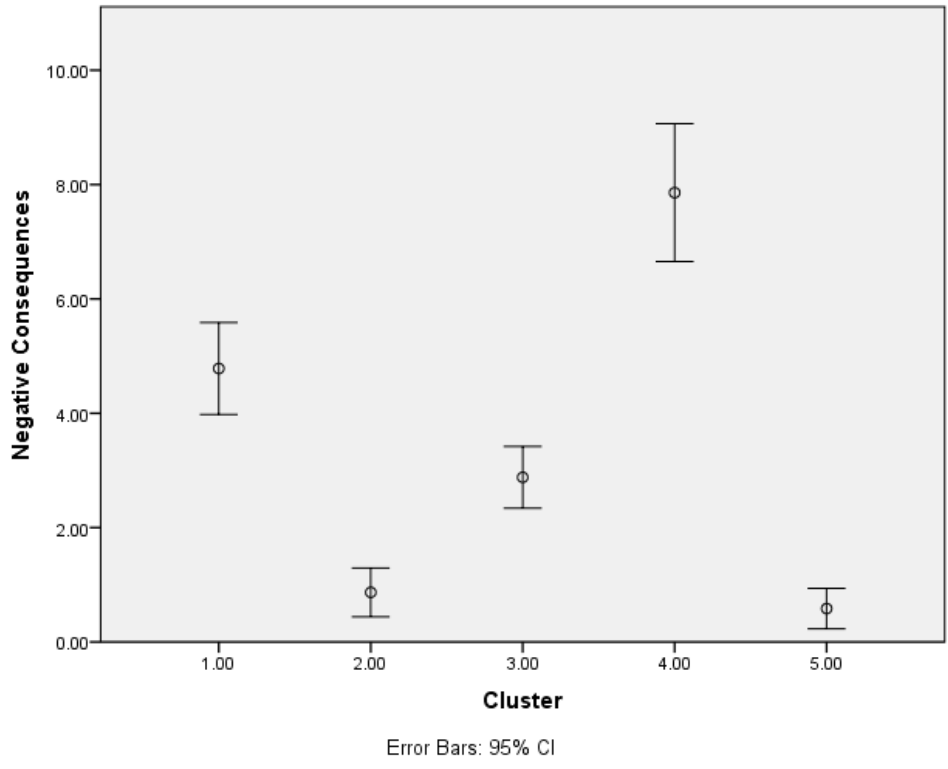


Figure 6. Negative Consequences by Cluster

## Chapter 5: Discussion

The purpose of this study was to examine the relationship between drinking motives and alcohol use outcomes among college softball teams. Athletes comprise a unique subpopulation of college students and prior research has concluded that general and athlete-specific motives, in combination, best capture the construct of drinking motives in this population (Martens et al., 2005). This investigation confirms that neither general drinking motives or athlete-specific motives alone predict alcohol use, binge drinking, or negative alcohol-related consequences. Indeed, a combination of general drinking motives and sport-specific drinking motives appear to be the most appropriate way to conceptualize the reasons for athlete alcohol use.

This study diverges from previous investigations of drinking motives in athletes in several noteworthy and methodologically advantageous ways. First, this study examined the relationship between drinking motives and alcohol outcomes, accounting for the naturally nested structure present when surveying athletes (who are nested within athletic teams). To my knowledge, this is the first such study to account for nested data, despite numerous studies that surveyed from a small number of universities, likely resulting with data nested within teams. Second, this study restricted participation to one gender and one sport-type in order to reduce extraneous variables that may influence the relationships of interest. This approach is uncommon in research on alcohol use in athletes, despite being warranted by numerous studies documenting significant differences in alcohol use between sport-types and an even larger body of literature attesting to gender differences in alcohol use. Lastly, data collection occurred exclusively during the competitive season, as athlete-specific drinking motives are more salient during this period (Martens & Martin, 2010). Additionally, most institutions have policies pertaining to athlete alcohol use during the competitive season which could impact athlete alcohol use patterns if

surveying athletes at various time points throughout the year. Furthermore, the potential deleterious consequences posed by risky alcohol use on athletic performance are prominent concerns for coaching staff and athletic departments, and these are only present within the season of competition.

This study also diverges from previous investigations of drinking motives by its findings which differed in a number of ways. First, fewer of the drinking motives were associated with alcohol outcomes than would be expected based on previous findings. However, the majority of previous findings were correlational, whereas the current study use regression-based methods. Additionally, this result could have been influenced by constraining the study to data collection during the competitive season only, examining this relationship across all divisions (a large proportion of previous research only sampled division I athletes), or surveying in one sport-type only.

Consistencies and inconsistencies between the current study and prior research will be highlighted below in regards to general drinking motives. Consistent with previous research, Coping correlated with alcohol outcomes (Doumas & Midgett, 2015; Martens, Cox, Beck & Heppner, 2003; Martens, Rocha, et al., 2008) and significantly predicted consequences (Doumas, 2013; Doumas & Midgett, 2015). However, Coping motive did not predict alcohol use or binge drinking in the multilevel model, which differed from one recent finding (Doumas & Midgett, 2015). Social motive was significantly and consistently correlated with alcohol outcomes, which replicated prior findings (Martens, Cox, Beck, & Heppner, 2003; Martens, Rocha, et al., 2008). However, Social motive only significantly predicted alcohol use, not binge drinking or negative consequences. Enhancement motive consistently and significantly correlated with alcohol outcomes and additionally significantly predicted binge drinking and consequences, but not

alcohol use. In contrast, Doumas and Midgett (2015) found that Enhancement motive predicted alcohol use but did not predict alcohol-related problems. One possible explanation, is that the other motives included in the analyses in this study (e.g., Positive Reinforcement motive from the ADS) better predicted alcohol outcomes compared to Enhancement motive, whereas in Doumas and Midgett's study, athlete-specific motives were not included in the model. Separately, Enhancement motive has previously correlated with alcohol use and binge drinking (Martens, Cox, Beck, & Heppner, 2003; Martens, Rocha, et al., 2008). The results for Conformity motive differed between the relationships revealed in a correlation and that of the multilevel model. Conformity motive was uncorrelated with alcohol use, had a significant but very small ( $r = .10$ ) correlation with binge drinking, and had a moderate correlation with consequences. The multilevel model revealed a significant, but inverse, relationship between Conformity motive and alcohol use, no relationship with binge drinking, and a significant positive relationship with consequences. In contrast, previous findings have observed that alcohol use is significantly correlated with Conformity motive, albeit small in magnitude (Martens, Cox, Beck & Heppner, 2003; Martens, Rocha, et al., 2008). Consistent with current findings, Conformity motive was significantly correlated with consequences (Martens, Rocha, et al., 2008), and predicted negative consequences (Doumas, 2013). Overall, the relationship between Conformity motive and alcohol use is mixed, with current findings (inverse relationship) contributing to the unclear nature of this relationship. The relationship between Conformity motive and negative alcohol-related consequences has more routinely been associated with this motive, a finding confirmed by this study.

Next, consistencies and inconsistencies between the current study and prior research will be highlighted in regards to athlete-specific drinking motives. Consistent with previous research,

Positive Reinforcement motive was associated with alcohol use, binge drinking, and consequences (Martens et al., 2005; 2011; Martens, Labrie, et al., 2008; Martens & Martin, 2010). Sport-Related Coping motive significantly correlated with all three alcohol outcomes with moderate magnitudes, a finding consistent with some previous studies (Martens, Labrie, et al., 2008; Martin & Martens, 2010). However, Sport-Related Coping motive was not predictive of the dependent variables in the multilevel models, which is inconsistent with prior findings of a significant relationship with alcohol use in an SEM (Martens et al., 2011) and with consequences in a regression analysis (Martens et al., 2005). Overall, findings regarding the relationship of Sport-Related Coping motive to various alcohol outcomes is mixed, and this study further supports the inconsistent nature of findings with this motive. In the current study, Team motive was not correlated with alcohol use, and had significant but small correlations with binge drinking and consequences, whereas one study found Team/group motives correlated with alcohol use and consequences (Martens & Martin, 2010). Team motive was not predictive of any outcomes in the multilevel model which is consistent with a previous finding that utilized a regression analysis (Martens et al., 2005).

Aside from differences in sampling characteristics and methodology, the pattern of results in this study can be discussed in light of low levels of endorsement of drinking motives as well as lower rates of heavy alcohol use. It is not surprising that fewer relationships between motives and alcohol outcomes emerged from this study, when a large proportion of athletes reported little to no recent alcohol use and therefore were not endorsing motives for alcohol use. This type of response pattern truncates the range of responses on the variables of interest and may impact the results, obscuring the true relationships between variables among the athletes who may be strongly influenced by drinking motives.



This study was the first study to apply model-based clustering to drinking motives in athletes. The results revealed five drinking motives clusters: moderate/typical (cluster 1), low/moderate Team (cluster 2), moderate (cluster 3), high (cluster 4), and low (cluster 5). *Moderate/typical motives* group consisted of moderate means on the drinking motives with higher means on Social and Positive Reinforcement motives which are both commonly endorsed drinking motives. *Low/moderate Team motives* group consisted of lower than average motives with exception of Team motive which was higher than the study mean. *Moderate motives* group consisted with motives close to the mean for all motives subscales. *High motives* group consisted of the highest means on all seven motives subscales, whereas the *low motives* group had the lowest means on all 7 drinking motives. Overall, cluster membership was associated with athlete alcohol use, binge drinking, and negative alcohol-related consequences.

Cluster 4, followed by cluster 1, emerged as most predictive of alcohol use, binge drinking, and negative consequences. There was no significant difference between these clusters on alcohol use. However, significant differences emerged in binge drinking and negative consequences. Cluster 4 is clearly the riskiest group as the athletes in this group consume comparatively high amounts of alcohol, binge drink more, and experience more alcohol-related negative consequences. Considering cluster 4 is comprised of athletes with the highest levels of drinking motives across all seven subscales, it is not surprising that these athletes are consuming more alcohol and binge drinking more. However, it is concerning that the type of alcohol use occurring among this group of athletes is resulting in significantly higher negative consequences as a result, compared to all the other drinking motives groups.

Ultimately, this investigation may raise more questions than it can answer. Additional research is compulsory in order to decipher whether the pattern of differences observed in this

study (compared to past research) is the result of differences in methodological approaches or a pristine interpretation of the relationship among these variables, or some combination. It is apparent that alcohol use in athletes is a common occurrence, and this study certainly contributes to our understanding of the motives that are likely to lead to increased alcohol use and negative consequences. This study raises further questions about the factors that may account for the athletes that do not succumb to increased alcohol use, especially if surrounded by teammates that may pressure them to conform to a culture of heavy alcohol use. What motives enable some athletes to resist pressure from teammates or, altogether, dissuade them from engaging in a common pastime among American college students? More recent research aims to illuminate the motives for non-use of alcohol (Milroy et al., 2014). Future research would be advantaged by concurrently measuring athlete drinking motives as well as athlete alcohol non-use motives.

### **Limitations**

Although the present study holds promise in helping move research on athlete drinking motives forward, it certainly has limitations that warrant mention. First, this study was restricted to softball athletes only (females) with a primarily European American sample composition. Therefore, generalizability to other sports, genders, or ethnicities should be done with caution. Although all NCAA softball teams in the United States were contacted for participation in this study, the sample was collected by convenience. Future research should replicate this investigation with other sports and extend upon findings by utilizing a longitudinal design of repeated measures to examine drinking motives across the competitive season and off-season.

Other considerations with the use of survey data include data that rely on self-report and retrospective reporting. Self-reported alcohol use is common and accepted practice in studies examining alcohol use among college students. Finally, cause and effect relationships between

drinking motives and alcohol use cannot be drawn from cross-sectional data.

### **Study Implications**

Findings from the present investigation support drinking motives as a significant variable that influences alcohol outcomes in college softball players, and that athletes can be grouped into drinking motive clusters which then predict alcohol outcomes. Assessing general and sport-related motives in the competitive season provide important information that can be drawn on for alcohol prevention efforts. Results demonstrated the importance of alcohol use as a mechanism of rewarding oneself for hard work or a good athletic performance during the competitive season. Thus, attempts to control alcohol use among college athletes should emphasize alternative methods of positive reinforcement or methods to celebrate personal or team victories.

This is the first study to examine the relationship between drinking motives and alcohol use between teams with multilevel modeling. The between-team variance in alcohol outcomes provide unique insights into the variability in patterns of alcohol use between athletic teams. Such variability implies contextual effects of the team environment impacting the alcohol use of individual players. Consideration of team-level influences on player alcohol use might be a worthy topic of inclusion in alcohol prevention programming, which most often addresses individual-level factors.

Of particular importance are the potential implications for athlete performance and safety of alcohol use during the competitive season. The findings outlined above have implications for prevention and intervention efforts aimed at decreasing drinking and alcohol-related consequences for student-athletes. Clearly, athletes who more highly endorse drinking motives constitute a group that binge drinks more and experiences more consequences as a result. Online prevention programs for alcohol use are commercially available and are cost-effective and easy

to disseminate to large groups of students. The provision of personalized feedback based on drinking motives could increase student-athlete self-understanding of the role of alcohol use in their lives and perhaps lead to corrective action to curb alcohol use. Alternatively, counselors working with student-athletes could assess athlete motives as part of routine care to identify student-athletes at higher risk for alcohol-related consequences. The higher risk athletes may benefit from targeted prevention strategies that provide information about the motivational framework of alcohol use and embed alternatives to drinking or other coping mechanisms.

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## Curriculum Vitae

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### EDUCATION

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**Ph.D.**, Clinical Psychology, University of Nevada, Las Vegas (APA-Accredited) Expected 2017  
**Dissertation:** Athlete alcohol use and alcohol-related consequences: The role of drinking motives  
Chair: Brad Donohue, Ph.D.

**M.A.**, Psychology, University of Nevada, Las Vegas August 2014  
**Thesis:** Development and testing of the Home Safety and Beautification Checklist with mothers  
referred for child neglect and substance abuse  
Chair: Brad Donohue, Ph.D.

**B.A.**, Psychology, University of California, Santa Barbara June 2008  
Graduated with Honors

### PRE-DOCTORAL INTERNSHIP

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**VA Boston Healthcare System Psychology Internship Training Program** Aug. 2016 – Aug. 2017  
**Brocton Substance Abuse Spectrum match rotation**  
Boston, MA

### PRACTICUM TRAINING

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**VA Southern Nevada Healthcare System,** July 2015–Present  
**Polytrauma Clinic** Supervisor: Carl D. Williams, Ph.D.  
Las Vegas, NV 16 to 20 hours per week

- Implemented brief evidence-based treatments for concomitant mental health and traumatic brain injury, as well as medical pain and diminished physical capacity.
- Therapeutic approaches utilized: CBT, CBT for Insomnia, Cognitive Processing Therapy, and Motivational Interviewing.
- Mental health consultation and liaison services to screen, increase motivation, and refer for longer-term or specialty mental health treatment. Interprofessional team approach to care with treatment team and case conference meetings.
- Integrated screening and treatment monitoring assessments such as the BAI, BDI-II, and PCL-S.
- Conducted neuropsychological assessments with clients at varying severity of brain injury.
- Weekly individual supervision. Training in and supervision of diagnostic interviews, treatment planning, and session notes within the CPRS medical records system.

**VA Southern Nevada Healthcare System,** Aug. 2014–July 2015  
**Addictive Disorders Treatment Program** Supervisor: Carl D. Williams, Ph.D.  
Las Vegas, NV 16 to 20 hours per week

- Implemented evidence-based treatments for substance use disorders, post-traumatic stress disorder, and other co-occurring diagnoses. Therapeutic approaches utilized: CBT for Substance Use Disorders and adapted for Gambling Use Disorder, Cognitive Processing Therapy, DBT, Motivational Interviewing, and Seeking Safety.
- Co-led several weekly groups including Gambling Group, Seeking Safety group for co-occurring PTSD and substance use, and Pain Management for psychiatric inpatients.

- Frequently utilized screening and treatment monitoring assessments such as the BDI-II, PTSD Checklist, and South Oaks Gambling Screen.
- Conducted comprehensive psychological assessments with a wide range of referral questions including differential diagnoses for personality assessments, ADHD, Autism Spectrum, dementia, and psychological competency.
- Weekly individual and group supervision. Training in and supervision of diagnostic interviews, treatment planning, and session notes within the CPRS medical records system. Supervision also included in-vivo and group therapy observations.

**VA Southern Nevada Healthcare System,  
Primary Care Integration Program**  
Las Vegas, NV

Aug. 2013–Aug. 2014  
Supervisor: Sarah Raymond, Ph.D.  
14 to 16 hours per week

- Implemented evidence-based treatments for a range of mental health and medical concerns in a comprehensive care model. Approaches emphasized: CBT, Cognitive Processing Therapy, DBT, and MI.
- Conducted clinical intake assessments and collaborative treatment planning.
- Co-led a 10-week DBT skills group for female veterans with Jeffrey Wood, Psy.D.
- Weekly individual supervision for individual and, separately, group therapy, and weekly case conference meetings.

**Departmental Community Mental Health Clinic**  
University of Nevada, Las Vegas  
Las Vegas, NV

Aug. 2012–Aug. 2013  
Supervisor: Jason Holland, Ph.D. August-May  
Noelle Lefforge, Ph.D. May-August  
12 to 16 hours per week

- Long-term individual therapy with a caseload of approximately 5-8 clients per week in an outpatient psychology department-sponsored mental health training clinic. Diagnoses included personality disorders, affective disorders, anxiety disorders, and adjustment disorders. Primary theoretical approach utilized included DBT and interpersonal process therapy.
- Supervision consisted of weekly individual and group meetings with digital video review. Also attended weekly practicum seminars, which included didactic, group supervision, and case conference components.

**Psychological Assessment & Testing Clinic**  
University of Nevada, Las Vegas  
Las Vegas, NV

Aug. 2012–May 2015  
Supervisor: Michelle G. Paul, Ph.D.  
Secondary Supervisor: Stephen Benning, Ph.D.

- Conducted neuropsychological, psychoeducational, personality, and intellectual assessments using a flexible battery with adults and children referred from the community and the School of Medicine in an outpatient psychology department-sponsored mental health training clinic.
- Further responsibilities included interviewing, scoring, interpretation, integrated report writing, differential diagnosis, and provision of feedback to clients.
- Comprehensive integrated assessment cases completed with a range of referral questions including ADHD, psychopathy, oppositional defiant disorder, and intellectual giftedness.
- Supervision included reviewing cases, joint determination of assessment battery and interpretation of results, report revisions, and discussion of feedback.

**SUPPLEMENTAL PRACTICUM TRAINING**

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**Las Vegas Recovery Center**  
Las Vegas, NV

May 2015–Aug. 2015  
Supervisor: Daniel Shiode, Psy.D.  
10 hours per week

- Implemented brief and milieu-based therapies for clients in residential treatment for chronic pain recovery and addiction to opiate-based pharmacological treatments. Primary approaches utilized: DBT and Motivational Interviewing to address a variety of client needs for pain recovery and concomitant personality, anxiety, and affective disorders.
- Co-led weekly Pain Recovery group with head physician, Mel Pohl, M.D.
- Supervision consisted of weekly individual and interprofessional group meetings.

**Surgical Weight Control Center**

Las Vegas, NV

Aug. 2014–July 2015

Supervisor: Lindsey Ricciardi, Ph.D.

Up to 4 hours per week

- Conducted pre-operative psychological evaluations for bariatric surgery candidates focused on psychological and behavioral wellness and medical adherence.
- Led monthly therapeutic group with clientele at various stages post-bariatric surgery. Focused on behavioral and emotional aspects related to adherence to long-term post surgery recommendations.
- Supervision consisted of individual meetings.

**The Optimum Performance Program in Sports**

University of Nevada, Las Vegas

Aug. 2012–July 2014

Supervisor: Brad Donohue, Ph.D.

Up to 10 hours per week

- Assisted in development and refinement of a significant-other supported behavioral treatment for collegiate athletes with substance use disorders as part of a NIDA-funded RCT.
- Conducted manualized 12 session evidence-based treatment (Family Behavior Therapy) to control substance use and improve athletic performance for Division I athletes.
- Weekly individual and group supervision, as well as audiotape review for treatment adherence.

**PROVISION OF SUPERVISION**

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**Departmental Community Mental Health Clinic**

University of Nevada, Las Vegas

Summer, 2014 and 2015

Supervisors: Michelle Paul, Ph.D.

and Noelle Lefforge, Ph.D.

*Supervisor-in-Training*

- Supervised two beginning practicum students for two consecutive summer terms. Concurrent enrollment in Intro to Supervision course in the summer of 2014.
- Received weekly supervision of supervision, group supervision of supervision, and utilized digital video review of my provision of supervision.

**RESEARCH**

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**Family Research and Services**

University of Nevada, Las Vegas

August 2011–Present

Advisor: Brad Donohue, Ph.D.

Study (dissertation): NCAA athlete alcohol use grant

- Project development and grant application of a study examining general and athlete-specific drinking motives in predicting profiles of heavy alcohol use and alcohol-related negative consequences among collegiate softball athletes.
- Multilevel modeling techniques to examine drinking motives within and between teams.
- Responsibilities also included IRB application, participant recruitment, survey development, and data analyses. Participant recruitment activities resulted in 897 student-athlete participants.
  - Sub-study: Creation and initial psychometric validation of a novel measure to assess head coach attitudes and behaviors regarding athlete alcohol use.
    - Study examined the influence of coach attitudes and behaviors on the alcohol use of athletes on their teams.

Study: Evaluation of Family Behavior Therapy in collegiate athletes (NIDA funded R01 grant, 1R01DA031828)

- Research coordinator for study evaluating the efficacy of Family Behavior Therapy for substance abuse adapted for collegiate athletes. Supervised data management, outcomes assessments, treatment adherence, IRB, participant incentives, quality assurance, and research meetings.
- Supervised and mentored a team of undergraduate research assistants.
  - Sub-study: Alcohol prevention for freshman athletes (Alcohol Beverage Medical Research funded).
    - Assisted in participant recruitment, collected participant pre- and post-intervention data, assisted in the development of the prevention intervention, and implemented alcohol prevention intervention with athletes.

Study: Concurrent drug abuse treatment and HIV prevention in child neglecting mothers, NIDA funded R01 grant (DA020548-01A1)

- Assisted in preparing data and intervention components for dissemination of study evaluating treatment for substance-abusing mothers identified by Child Protective Services to participate in a therapeutic program.
- Assisted in grant writing to further develop and study the outcomes of Family Behavior Therapy in different populations. Mentored undergraduate research assistants.
  - Sub-study (thesis): Examination of the psychometric properties of a novel home safety assessment to utilize in treatment planning for remediation of child safety hazards in the homes of mothers involved in CPS treatment services for child neglect.

### **Central Recovery Services**

Las Vegas, NV

May 2013–October 2013

Advisor: Noelle Lefforge, Ph.D.

- Provided assistance in data consultation project on assessment of program outcomes of substance abuse and chronic pain recovery treatment. Consulted on improvements for measurement of outcomes and program sustainability.

## **GRANT INVOLVEMENT**

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### **Family Behavior Therapy for Collegiate Athletes (1R01DA031828)**

*Grant Coordinator*

Funding Agency: National Institutes on Drug Abuse. Principal Investigator: Brad Donohue, Ph.D.  
\$1,998,000.

### **Athlete Alcohol Use Graduate Student Research Grant**

*Student Investigator*

Funding Agency: National Collegiate Athletics Association Sport Science Institute  
\$7,500.

### **Great Plays Alcohol Abuse Prevention**

*Prevention Educator*

Funding Agency: Alcohol Beverage Medical Research. Principal Investigator: Brad Donohue, Ph.D.  
\$30,000.

### **Concurrent Drug Abuse Treatment and HIV Prevention in Child Neglecting Mothers (1R01DA020548)**

*Project Coordinator*

Funding Agency: National Institutes on Drug Abuse. Principal Investigator: Brad Donohue, Ph.D.  
\$1,350,000.

## **PUBLICATIONS AND PRESENTATIONS**

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### **Manuscripts Published**

- Donohue, B., **Pitts, M.**, Chow, G., Benning, S., Soto-Nevarez, A., Plant, C., & Allen, D. N. (2015). Development and initial psychometric examination of the Home Safety and Beautification Assessment in mothers referred to treatment by child welfare agents. *Psychological Assessment*. Advance online publication. doi.org/10.1037/pas0000197
- Pitts, M.**, Donohue, B., Schubert, K. N., Chow, G. M., Loughran, T., & Gavrilova, Y. (2015). A systematic case examination of The Optimum Performance Program in Sports in a combat sport athlete. *Clinical Case Studies, 14*, 178-190.
- Donohue, B., Chow, G. M., **Pitts, M.**, Loughran, T., Schubert, K. N., Gavrilova, Y., & Allen, D. N. (2015). Piloting The Optimum Performance Program in Sports: A family-supported approach to concurrently enhancing mental health and sport performance in athletes. *Clinical Case Studies, 14*, 159-177.
- Chow, G. M., Donohue, B., **Pitts, M.**, Loughran, T., Schubert, K. N., Gavrilova, Y., & Diaz, E. (2015). Results of a single case controlled study of The Optimum Performance Program in Sports in a collegiate cheer and dance athlete. *Clinical Case Studies, 14*, 191-209.
- Donohue, B., **Pitts, M.**, Gavrilova, Y., Ayarza, A., & Cintron, K. (2013). A culturally sensitive approach to treating substance abuse in athletes using evidence-supported methods. *Journal of Clinical Sport Psychology, 7*, 98-119.

### **Book Chapters**

- Urgelles, J., **Pitts, M.**, & Gorog, L. (in press). Hispanic children and integrated care. In L. T. Benuto & B. Leany (Eds.), *Enhancing behavioral health in Hispanic populations: Eliminating disparities through integrated behavioral and primary care*. New York, NY: Springer.

### **Conference Verbal Presentations**

- Chow, G. M., **Pitts, M.**, & Yang, Y. (2015, October). *The influence of collegiate softball coaches on the alcohol use of their athletes*. Paper presented at the annual conference of the Association for Applied Sport Psychology, Indianapolis, IN.
- Pitts, M.**, Donohue, B., Chow, G., Loughran, T., Schubert, K., & Gavrilova, Y. (2014, October). Case study examination of the Optimum Performance Program in Sports in a collegiate athlete. In B. Donohue, M. Pitts, & K. Schubert (Chairs), *Development and initial examination of the Optimum Performance Program in Sports: Bridging the gap between mental health and sport performance*. Symposium conducted at the annual conference of the Association for Applied Sport Psychology, Las Vegas, NV.
- Schubert, K., & **Pitts, M.** (2014, April). Evidence-based substance abuse treatment tailored for the culture of college athletics. In B. Donohue (Chair), *Process of developing a non-stigmatizing, positive environmental context for the Optimum Performance Program in Sports: An alternative to the traditional campus counseling approach to addressing mental health*. Symposium conducted at the

annual convention of the Western Psychological Association, Portland, OR.

Urgelles, J., **Pitts, M.**, Wilks, C., Ayarza, A., & Donohue, B. (2012, August). *Integrating behavioral interventions in family therapy to manage triggers to drug use*. In M. Kenny & J. Urgelles (Chairs). Skills-building session conducted at the annual convention of the American Psychological Association, Orlando, FL.

**Pitts, M.**, & Urgelles, J. (2012, April). Initial evaluation of a standardized goals intervention in the treatment of mothers referred for substance abuse and child neglect. In J. Urgelles (Chair), *Behavioral treatment innovations in the treatment of concurrent substance abuse and child neglect*. Symposium conducted at the annual convention of the Western Psychological Association, San Francisco, CA.

Lynch, S., Bradshaw, K., **Pitts, M.**, & Donohue, B. (2012, April). *Family-supported contingency management*. Technical workshop conducted at the annual Joint Meeting on Adolescent Treatment Effectiveness, Washington D.C.

### **Other Verbal Presentations**

Donohue, B., Ayarza, A., **Pitts, M.**, & Bradshaw, K. (2012, March). *Family Behavior Therapy: An evidence-based approach for adolescent substance abuse and associated problems*. Training conducted for the Nevada Psychological Association, Las Vegas, NV.

### **Conference Poster Presentations**

Loughran, T., Soto-Nevarez, A., **Pitts, M.**, Schubert, K., Gavrilova, Y., Chow, G., & Donohue, B. (2015, November). *Evaluation of a goal-oriented alcohol prevention program in student-athletes*. Poster presented at the annual convention of the Association for Behavioral and Cognitive Therapies, Chicago, IL.

**Pitts, M.**, & Chow, G. (2015, August). *Relationship between general and sport-related drinking motives and athlete alcohol use and problems*. Poster presented at the annual convention of the American Psychological Association, Toronto, ON.

Plant, C. P., Torres, A., Dowd, A., **Pitts, M.**, & Donohue, B. (2015, April). *Examination of a family based behavioral goals intervention on child maltreatment in mothers who abuse illicit drugs*. Poster presented at the annual convention of the Western Psychological Association, Las Vegas, NV.

Loughran, T., Chow, G., **Pitts, M.**, Schubert, K., Gavrilova, Y., & Donohue, B. (2014, October). *Frequency of alcohol use as a predictor of mental health symptoms in collegiate athletes*. Poster presented at the annual conference of the Association for Applied Sport Psychology, Las Vegas, NV.

Chow, G. M., Donohue, B., Diaz, E., **Pitts, M.**, Loughran, T., Schubert, K. N., & Gavrilova, Y. (2014, October). *A sport-specific Family Behavior Therapy for athletes: A multiple-baseline case study of a collegiate cheer and dance athlete*. Poster presented at the annual conference of the Association for Applied Sport Psychology, Las Vegas, NV.

**Pitts, M.**, Chow, G., Schubert, K., Soto-Nevarez, A., & Donohue, B. (2014, April). *The concordance among three measures of depression in college athletes*. Poster presented at the annual convention of the Western Psychological Association, Portland, OR.

**Pitts, M.**, El Ansari, K., Gavrilova, Y., Schubert, K., & Donohue, B. (2014, April). *Are client preferences for intervention components consistent with treatment dosage? Results from an intervention outcome study in a sample of college athletes*. Poster presented at the annual convention of the Western Psychological Association, Portland, OR.

Brouwers, V. P., Diliberto, R., & **Pitts, M.**, & Barchard, K. (2014, April). *Examining the psychometric*

- properties of the empathic concern scale.* Poster presented at the annual convention of the Western Psychological Association, Portland, OR.
- Soto-Nevarez, A., Dowd, A., Swarzman, E., **Pitts, M.**, Chow, G., & Donohue, B. (2014, April). *Examination of a home safety and home appearance scale in a sample of neglected children.* Poster presented at the annual convention of the Western Psychological Association, Portland, OR.
- Gavrilova, Y., Armenta, S., Palou, Q., Torres, A., Schubert, K., **Pitts, M.**, & Donohue, B. (2014, April). *Development and dissemination of administrative procedures of an evidence-supported clinic.* Poster presented at the annual convention of the Western Psychological Association, Portland, OR.
- Diaz, E., Kong, P., Swarzman, E., Gonzalez-Bueno, A., Gavrilova, Y., Loughran, T., **Pitts, M.**, Chow, G., Kelleher, L., & Donohue, B. (2012, October). *Factors that interfere with sport performance and alcohol use among collegiate athletes.* Poster presented at the annual conference of the Association for Applied Sport Psychology, New Orleans, LA.
- Urgelles, J., **Pitts, M.**, Wilks, C., & Donohue, B. (2012, April). *An empirically supported method for gaining employment within the context of adolescent drug abuse.* Poster presented at the annual Joint Meeting on Adolescent Treatment Effectiveness, Washington D.C.
- Urgelles, J., Wilks, C., **Pitts, M.**, & Donohue, B. (2012, April). *Factors associated with discontinuance of child custody in mothers referred by child protective services.* Poster presented at the annual convention of the Western Psychological Association, San Francisco, CA.
- Sullivan, K., **Pitts, M.**, Tawalbeh, S., & Cosden, M. (2011, August). *Web-based surveys, personal interview, or methods triangulation: What best measures college students' alcohol and drug use?* Poster presented at the annual convention of the American Psychological Association, Washington D.C.
- Sullivan, K., Cosden, M., **Pitts, M.**, & Tawalbeh, S. (2011, February). *High school to college drinking trajectories: Risk factors and implications for intervention.* Poster presented at the convention for the National Association for School Psychologists, San Francisco, CA.

## **EDITORIAL EXPERIENCE**

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**Journal of Child and Adolescent Substance Abuse**

May 2012-September 2013

*Editorial Assistant*

### **Ad Hoc Reviews**

Clinical Case Studies

Clinical Psychology Review

Journal of Adolescent Health

Journal of Child and Adolescent Substance Abuse

Journal of Developmental and Physical Disabilities

## **TEACHING**

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**Introduction to Psychology, PSY 101, University of Nevada Las Vegas**

August 2014-May 2015

*Instructor*

Supervisor: Wayne Weiten, Ph.D.

Instructor of two sections of live classroom Psychology 101 courses each semester. Developed syllabi, planned courses, prepared and presented lectures, facilitated class discussions, developed online content pages, and wrote and graded exams. Concurrently enrolled in Teaching of Psychology with a supervisory component for the initial semester of teaching.

**University Success Course, ED 20, University of California Santa Barbara** Spring 2010  
*Discussion Leader* Supervisor: Don Lubach, Ph.D.  
 Led weekly discussion section exploring lecture topics with 22 first-year college students. Planned class exercises, graded assignments, and fostered a positive learning environment. Directly supervised and mentored two undergraduate student co-leaders.

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## LEADERSHIP AND SERVICE

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**American Psychological Association of Graduate Students (APAGS)** March 2014-Present  
*State Advocacy Coordinator (Nevada)*

- Representative to APAGS for all psychology students in Nevada. Advocates for graduate students, the psychology profession, psychological research, and social justice issues.
- Plans and coordinates several events including educational series and diversity-related discussion groups.
- Acts as a resource of information on legislative issues, monitors listservs for related issues, and submits monthly reports of advocacy efforts. Attends monthly legislative committee meetings.

**UNLV Clinical Psychology Doctoral Student Committee**

*Chair* August 2015–Present  
*Cohort Representative and Treasurer* August 2012–August 2013

- Liaison between graduate students and faculty, advocates for student needs, coordinates incoming student interview day, and plans graduate student social functions.

**Outreach Undergraduate Mentoring Program** Fall 2012-Present

*Graduate Student Mentor*

- Mentor psychology undergraduates from underrepresented backgrounds complete undergraduate degrees, prepare graduate school applications, and explore potential career paths in psychology.

**American Psychological Association of Graduate Students (APAGS)** May 2013–March 2014  
*Campus Representative*

- Disseminated information from APAGS to graduate students, and collected information from students to assist APAGS in addressing student needs.
- Mobilized efforts on campus to respond to legislative advocacy alerts.
- Coordinated with the Nevada Psychological Association to assist in garnering student support for state initiatives and planned events for legislation and member education.

**Active Minds Mental Health Advocacy Student Organization** 2008  
 Founding Member and Secretary, University of California Santa Barbara

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## PROFESSIONAL AFFILIATIONS

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Association for Applied Sport Psychology	2013–Present
Association for Behavioral and Cognitive Therapies	2015–Present
American Psychological Association	2012–Present
Nevada Psychological Association	2012–Present
Western Psychological Association	2011–Present

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## OTHER RELEVANT WORK AND TRAINING

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**Diversity Graduate Assistantship** August 2015–Present  
 Las Vegas, NV Supervisor: Noelle Lefforge, Ph.D.



- Graduate Assistant responsible for departmental diversity initiatives to enhance knowledge and awareness of issues surrounding diversity and multiculturalism in research, teaching, and clinical training.
- Initiatives include increasing the number of faculty and graduate students from underrepresented backgrounds, increasing the integration of diversity-related material into psychology coursework, and hosting diversity-related events.
- Coordinate departmental undergraduate mentoring program of approximately 40 students from underrepresented backgrounds; program provides assistance on how to enter graduate training for professions in psychology. Personally mentor 12 students.

**CBT for Treating Late Life Depression and Caregiving Stress** Fall 2015, 3 hours  
 Larry Thompson, Ph.D., & Dolores Gallagher Thompson, PhD.  
 Training on CBT treatment and techniques with older adults with depression. Training on stress in caregivers of adults with dementia and an evidence-based caregiver CBT skills treatment program.

**Gottman Method Couples Therapy Training** Fall 2015, 6 hours  
 Scott Wolfe, Ph.D.  
 Training on the nine components of healthy relationships, infidelity in relationships, sexual intimacy, and Gottman interventions to address these areas in treatment.

**Diagnosing Autism and Related PDDs, Pediatric Bipolar Disorder, ADHD, and Applications of BASC-2 in Behavioral RTI: An Advanced Training on the BASC-2** Spring 2013, 7 hour  
 Cecil Reynolds, Ph.D.  
 Training on diagnostic issues and the use of behavioral rating scales, the components of the BASC-2, and the use of special norms and scaling for differential diagnosis.

**Motivational Interviewing Training** Spring 2013, 13 hours  
 Kamilla Venner, Ph.D., University of New Mexico  
 Two-day training on basic principles and underlying spirit of MI. Learned core skills of this dynamic counseling approach, and outcome research reviewed. The use of role-plays and vignettes were incorporated for an active and skill-based training approach.

**Alcohol Behavioral Couple Therapy Training** Spring 2013, 6.5 hours  
 Barbara McCrady, Ph.D., University of New Mexico  
 Training on evidence-based treatment for individuals with substance use disorders and their intimate partners. This cognitive-behavioral approach was reviewed with treatment targets, techniques to achieve treatment outcomes, and strategies for involving intimate partners in treatment.

**Dialectical Behavior Therapy Training** 2013, 54 hours  
 Alan Fruzzetti, Ph.D.  
 Comprehensive 8-day training to address theory and structure of DBT treatment, treatment strategies, skills training and coaching, and consultation on the development of a DBT program.

**The Adolescent Community Reinforcement Approach Training** Spring 2012, 6.5 hours  
 Robert J. Meyers, Ph.D., University of New Mexico  
 Training on evidence-based substance use behavioral intervention to replace environmental contingencies supporting substance use with prosocial activities and behaviors for recovery. Reviewed program efficacy, treatment procedures, functional analysis, prosocial behavior, and substance use goal planning.

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## **AWARDS AND SCHOLARSHIPS**

Edward Lovinger Award (\$1,400), College of Liberal Arts, UNLV	2016
APAGS State Leader of the Year Award	2015
Sterling Scholarship (\$5,000), UNLV	2015
APAGS Excellence in State Leadership: Grassroots Mobilization Award	2015
Summer Session Scholarship (\$2,000), UNLV	2014
College of Liberal Arts Student Summer Research Award (\$3,000), UNLV	2013
Patricia Sastaunik Scholarship (\$2,500), UNLV	2013
Summer Session Scholarship (\$2,000), UNLV	2013
Family Research and Services Outstanding Graduate Student Research Award	2012

**GRANTS**

<b>Graduate Student Research Grant</b>	2014
National Collegiate Athletics Association Sport Science Institute (\$7,500)	