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# Relationships Between Participation in Athletics and Substance Use Among School Students

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Relationships Between Participation in Athletics and  
Substance Use Among School Students

by

Kevin M. Stockslager

A thesis submitted in partial fulfillment  
of the requirements for the degree of  
Education Specialist  
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Relationships Between Participation in Athletics and  
Substance Use Among High School Students

Kevin M. Stockslager

ABSTRACT

Substance use among high school students has become an increased concern for administrators, parents, and community members. Previous research has demonstrated relationships between adolescent substance use and numerous negative outcomes. This study investigated the relationship between athletic participation and substance use using self-report data from a sample of 139 high school students. Specifically, the current study examined the relationship between frequency and setting of participation in athletic activities (e.g., football, baseball, soccer) and multiple types of substance use (e.g., alcohol, tobacco, marijuana, other illicit drugs) in adolescents. The results of this study indicate that nonathletes reported significantly more marijuana use than athletes when gender, ethnicity, SES, and grade were controlled for in the analyses. Additionally, there was a significant relationship between students' grade and substance use. Specifically, 12<sup>th</sup> grade students reported significantly higher rates of alcohol use than 10<sup>th</sup> grade students. Implications for school psychologists and directions for future research are presented.

## Chapter One

### Introduction

#### *Statement of the Problem*

Substance use, defined as the use of a drug, medication, or toxin (DSM-IV-TR, American Psychiatric Association, 2000), among high school students has become an increased concern for school administrators, parents, and community members in the United States for many reasons. Substance use among adolescents has been associated with numerous negative outcomes, including reductions in educational attainment (Chatterji, 2006a; Chatterji, 2006b; Cox, Zhang, Johnson, & Bender, 2007; The Substance Use and Mental Health Services Administration, 2006), susceptibility to peer pressure, and low self-esteem (Dielman, 1987). Additionally, adolescents who engage in substance use are at an increased risk for developing a substance use disorder (SUD) as an adult (Offord & Ogborne, 2000), as well as numerous health risks, including substance overdose, impaired driving, and HIV infection (National Institute on Alcohol Abuse and Alcoholism, 1997).

Data collected from the 2006 National Institute on Drug Abuse survey pertaining to substance use among adolescents in grades 8, 10, and 12 indicate that nationally, 40% of 8<sup>th</sup> graders, 60% of 10<sup>th</sup> graders, and approximately 75% of 12<sup>th</sup> graders have at least tried alcohol (Johnston, O'Malley, Bachman, & Schulenberg, 2007). Also, over 30% of 10<sup>th</sup> and 12<sup>th</sup> graders reported using alcohol in the 30 days prior to the survey.

Additionally, about 30% of 10<sup>th</sup> graders and half of 12<sup>th</sup> graders reported at least trying cigarettes, with almost 22% of 12<sup>th</sup> graders smoking at least some in the prior month. Regarding high school students' use of illicit substances at some point in their lifetime, adolescents in the 12<sup>th</sup> grade indicated using the following substances one or more times in their lifetime: marijuana (42.3%), cocaine (8.5%), inhalants (11.1%), and ecstasy (MDMA) (6.5%). Prior research indicates that adolescents who use illicit substances at an early age have an increased risk for developing lifelong substance use disorders (SUDs) compared to individuals who begin using substances later in life (Miller, Davies, & Greenwald, 2000). Given the known risks involved with adolescent substance use, it is important that the predictors of early-onset substance use be identified so that appropriate preventative measures can be designed.

Recent research has examined the role of several demographic characteristics in adolescents' substance use. The 2006 National Institute on Drug Abuse survey found that while males exhibit somewhat higher rates of illicit drug use and are much more likely to use smokeless tobacco and steroids, rates of heavy drinking and cigarette smoking are fairly consistent across genders (Johnston et al., 2007). Additionally, the study found that differences in the use of certain drugs (i.e., cigarette smoking, binge drinking, and cocaine) by socioeconomic class are very small and the gap between socioeconomic groups continues to narrow. Regarding race/ethnicity, White students reported higher rates of illicit drug, alcohol, and cigarette use than Black adolescents (Johnston et al., 2007). This finding is contradictory to the popular assumption that Black adolescents exhibit higher rates of substance use than White adolescents.

Previous research focused on risk factors associated with adolescent substance use. Hawkins, Catalano, and Miller (1992) defined several risk factors, such as laws and norms favorable toward drug use, the availability of drugs, economic deprivation, early behavior problems, a family history of alcoholism and drug use, academic failure, peer rejection, and the early initiation of drug use associated with adolescents' peer groups and families. Other researchers also found that parent substance use and attitudes towards illicit drugs (Halebsky, 1987) and associating with peers who use substances (Musher-Eizenman, Holub, & Arnett, 2003) are factors that place adolescents at risk for using substances themselves.

Educational factors that have been found to predict students' substance use include academic underachievement (Bryant, Schulenberg, Bachman, O'Malley, & Johnson, 2000) and participation in athletics (Fredricks & Eccles, 2006; Naylor, Gardner, & Zaichkowsky, 2001). Bryant et al. (2000) found that lower levels of academic achievement contributed to increased levels of cigarette use between 8<sup>th</sup> and 10<sup>th</sup> grades and again between 10<sup>th</sup> and 12<sup>th</sup> grades. Additionally, previous studies have demonstrated the relationship between adolescent alcohol use (Chatterji, 2006a) and recent marijuana use (Chatterji, 2006b) and reductions in educational attainment. Regarding athletic participation, Naylor et al. (2001) found that interscholastic athletes were significantly less likely than nonathletes to smoke cigarettes and use cocaine or psychedelics. However, previous studies of athletic participation in relation to adolescent substance use are limited by their examination of athletic participation as a whole, ignoring potential differences between frequency and settings of athletic participation (Harrison & Narayan, 2003; Moore & Werch, 2005). Additionally, most research examining substance use has

been conducted using a college student population (Jones, Oeltmann, Wilson, Brener, & Hill, 2001; Lucey, Marel, Smith, Frank, & Schmeidler, 1999) or has examined only one type of substance (e.g., alcohol, tobacco, marijuana) as the outcome variable (Carr, 1990). Nevertheless, previous research has elicited valuable information demonstrating that students' participation in athletics is related to substance using behaviors. Additional research is needed to examine multiple aspects of participation in athletic activities in predicting multiple types of substance use in adolescents.

### *Athletic Participation*

The current study was designed to address the limitations of prior investigations of the relationship between substance use and athletic participation. Specifically, athletes were defined as students who participated on any state-sanctioned interscholastic athletic team (Naylor et al., 2001). Students who reported participating in athletics in only recreational settings were not considered athletes for the purpose of this study. Furthermore, the frequency and settings of involvement in various athletic activities was measured. For example, students' participation in various athletic activities (e.g., football, basketball, baseball/softball, hockey, soccer, golf, swimming) was evaluated by how frequently students participate in each activity and in which setting students participate in each activity. Participants replied to each activity by describing how often they are involved in that activity, ranging from never, to three or more times a week. Participants also reported the settings in which they typically participate in each activity (i.e., recreational, club teams, school teams).

### *Substance Use*

This study focused on adolescents currently enrolled in grades 9-12, who are not legally allowed to engage in substance using behaviors (e.g., consuming alcohol or using tobacco products). Substance use within this study encompassed a wide range of substances. This study examined substances in four categories: (a) alcohol (wine, beer, and liquor), (b) tobacco (cigarettes and cigars), (c) marijuana, and (d) other drugs (i.e., inhalants, prescription drugs not prescribed to you, ecstasy, hallucinogens, stimulants, barbiturates, and cocaine).

### *Purpose of the Current Study*

The current study expands on the aforementioned research on the relationship between athletic participation and substance use (e.g., Fredricks et al., 2006; Naylor et al., 2001). The existing body of literature has examined students' participation in athletics in broad terms, ignoring potential relationships between substance use and frequency and setting of athletic participation. Additionally, researchers have rarely examined substance use comprehensively (e.g., others examined only one substance such as alcohol). The present study examined participation in various athletic activities in order to identify important relationships between athletic participation and substance use in adolescents.

The current study contributes to the literature on adolescent substance use by providing a comprehensive investigation of participation in athletics. The study examined the strength of the relationship between participation in different athletic activities and multiple types of substance use among adolescents. Identifying potential relationships between the frequency and settings of athletic participation and various types of substance use will provide valuable information for future research.

## *Research Questions*

The research questions that were addressed in this study are as follows:

1. What is the frequency of student substance use in this sample with respect to the following drug groups?
  - A) Alcohol (wine, beer, and liquor)
  - B) Tobacco (cigarettes and cigars)
  - C) Marijuana
  - D) Other drugs (i.e., inhalants, prescription drugs not prescribed to you, ecstasy, hallucinogens, stimulants, barbiturates, and cocaine).
2. Are there differences in the frequency and type of drug and/or alcohol use among adolescent athletes<sup>1</sup> and non-athletes?
3. Are there gender and/or ethnicity differences in drug and/or alcohol use among adolescent athletes and nonathletes?
4. Are there relationships between the frequency and setting of athletic participation and adolescent substance use?

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<sup>1</sup> For the purpose of this study, athletes will be defined as students who report participating on a school sports team on the Participation in Athletic Activities Scale.

## Chapter Two

### Review of the Literature

The following literature review begins with a discussion of substance abuse disorders as well as the prevalence of substance use in adolescence. Negative attitudes associated with adolescent substance use are also reviewed. Then, risk factors for the initiation of substance use are discussed. Finally, school variables related to substance use are presented along with previous research on the relationships between participation in extracurricular and athletic activities and adolescent substance use.

#### *Substance Abuse Disorders*

Substance use by early adolescents has a negative impact on the well-being of students. Adolescents who engage in using substances are at an increased risk for negative consequences such as health problems (National Institute on Alcohol Abuse and Alcoholism, 1997), developing substance use disorders (Grant & Dawson, 1997; Anthony & Petronis, 1995), and reductions in academic achievement (Abdelrahman, Rodriguez, Ryan, French, & Weinbaum, 1998). Adolescence is a critical time during which students are particularly vulnerable to numerous negative outcomes.

Substance abuse disorders are defined by the Diagnostic and Statistical Manual-IV-TR (DSM-IV-TR, American Psychiatric Association, 2000) as:

A maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by one (or more) of the following, occurring

within a 12-month period: (1) recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to substance use; substance-related absences, suspensions, or expulsions from school; neglect of children or household), (2) recurrent substance use in situations in which it is physically hazardous (e.g., driving an automobile or operating a machine when impaired by substance use), (c) recurrent substance-related legal problems (e.g., arrests for substance-related disorderly conduct), and (d) continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (e.g., arguments with spouse about consequences of intoxication, physical fights) (p. 199).

The DSM-IV-TR groups commonly used substances into 11 classes: alcohol; amphetamine or similarly acting sympathomimetics; caffeine; cannabis; cocaine; hallucinogens; inhalants; nicotine; opioids; phencyclidine (PCP) or similarly acting arylcyclohexylamines; and sedatives, hypnotics, or anxiolytics (American Psychiatric Association, 2000). Substance use (as opposed to substance abuse) is often defined as using licit or legal substances without the negative side effects commonly associated with substance abuse.

#### *Prevalence of Substance Use in Adolescence*

The *Monitoring the Future* series, an annual survey of nationally representative samples, reports data on the substance use of 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> graders in the United States. In 2006, 40% of 8<sup>th</sup> graders, 60% of 10<sup>th</sup> graders, and 70% of 12<sup>th</sup> graders reported consuming alcohol over the course of their lifetime (Johnston et al., 2007). Tenth and

twelfth grade substance use rates are of particular interest to this investigation, as they highlight the substance use rates of students currently enrolled in high school. In addition to reporting high rates of lifetime alcohol use, many 10<sup>th</sup> (37%) and 12<sup>th</sup> graders (47%) reported having smoked cigarettes in their lifetime. Regarding the use of marijuana, 30%-40% of high school-age students reported trying marijuana at least once in their lifetime.

The prevalence rates of other illicit substances were also reported in the results. In 2006, 17% of 10<sup>th</sup> graders and about one quarter of 12<sup>th</sup> graders reported trying any illicit drug other than marijuana over the course of their lifetime. Of the substances categorized as illicit drugs other than marijuana, the most commonly used drugs among high school students were inhalants and amphetamines, which about 12% of students reported having used in their lifetime. Additionally, high school students reported relatively low lifetime use rates of hallucinogens (7%), ecstasy (MDMA) (5.5%), cocaine (7), tranquilizers (8.5%), and steroids (2%).

The *Monitoring the Future* study also focused on potential demographic characteristics associated with the prevalence of substance use. In particular, the researchers examined the impact of gender, SES, and race on substance use rates among adolescents. Data indicate that although males exhibited somewhat higher rates of illicit drug use and were much more likely to use smokeless tobacco and steroids, rates of heavy drinking and cigarette smoking were fairly consistent across genders (Johnston et al., 2007). The authors also noted that 10<sup>th</sup> grade females reported higher rates of alcohol use in the past 30 days than 10<sup>th</sup> grade males. Additionally, the study found very small differences in the use of several drugs between socioeconomic classes, and there has been a narrowing of the gap between socioeconomic class and the use of cocaine, cigarette

smoking, and binge drinking. With regards to race/ethnicity, White students reported higher rates of illicit drug, alcohol, and cigarette use than Black adolescents. This finding is contradictory to popular assumption that Black adolescents exhibit higher rates of substance use than White adolescents.

### *Negative Outcomes Associated with Adolescent Substance Use*

*Health related problems.* Numerous health risks are associated with adolescent substance use, the most extreme of which is mortality. One potential immediate neurological consequence of alcohol use in adolescents is alcohol poisoning. When adolescents consume massive amounts of alcohol, alcohol crosses the blood-brain barrier so that the concentration of alcohol in the brain is equivalent to the alcohol concentration in the blood. With increasing blood alcohol contents, adolescents may experience lethargy, respiratory depression, and/or vomiting. As adolescents continue to consume alcohol, raising their blood alcohol content, more adverse consequences can result. Alcohol poisoning, which often occurs when the individual's blood alcohol content is over 450 mg/dL, can result in the development of stupor, coma, and death (Zeigler et al., 2005). Adolescents typically have smaller bodies than average adults, resulting in quicker intoxication and sharper rises in blood alcohol content than average adults. Additionally, adolescents are often prone to heavy and rapid drinking until intoxicated due to less developed social, emotional control, thinking, and decision-making skills (Zeigler et al., 2005). Recent research by the Centers for Disease Control and Prevention (2003) found the drug-induced mortality rate for adolescents to be 9.1/100,000. Although alcohol-induced mortality is a rare occurrence among teenagers, it is a realistic consequence of

alcohol use. Additionally, substance using behaviors resulting in intoxication place adolescents at risk for other negative consequences.

While deaths related to alcohol poisoning are a less likely to occur among teenage populations, deaths caused by driving while intoxicated are a very realistic consequence associated with adolescent substance use. Chou et al. (2006) reported that nearly 40% of all traffic fatalities are alcohol-related, resulting in over 17,000 deaths and 258,000 injuries in the year 2002 alone. Driving while intoxicated, defined as operating a vehicle with a blood concentration (BAC) of .08 or above, is of special concern for younger individuals. Participants in the youngest age group (aged 18-29) reported a significantly higher rate (5.33%) of driving after having too much to drink than older participants. Additionally, males were three times more likely than females to report driving while drinking, driving after drinking too much, and drinking while being a passenger in the car.

Finally, drug use has been shown to be associated with early initiation of risky sexual behavior, potentially increasing the risk of acquiring HIV/AIDS among adolescents (Hawkins, Catalano, & Miller, 1992). In their study of 1,153 adolescents aged 15 to 21 years, Houck et al. (2006) evaluated the association between substance use, sexual behavior, and the risk of acquiring HIV/AIDS. The researchers used adolescents with a history of unprotected sex and assessed them in five domains of risk: unprotected sex, alcohol/marijuana use, other drug use, mental health crisis, and arrest/school dropout. The researchers used cluster analyses to group adolescents by risk factors, finding that the largest cluster (49% of males,  $n=251$ ) was defined primarily by significantly higher levels of alcohol consumption and marijuana use relative to peers as

well as many unprotected sexual acts. These findings suggest that alcohol, marijuana, and other drug use are associated with unprotected sexual acts, greatly increasing the risk of acquiring HIV/AIDS. Additionally, it is important to note that males were significantly more likely to engage in risky sexual acts. With the long-term risks and consequences associated with HIV/AIDS and other sexually transmitted diseases, it is necessary that prevention efforts be evaluated to reduce behaviors that place adolescents at risk for engaging in risky sexual behaviors. This study demonstrates the potential risks associated with substance using behaviors in adolescents, including risky sexual behaviors, and the greater risk of acquiring HIV/AIDS.

*Psychiatric Disorders in Adulthood.* Another long-term consequence of initiation in substance use during adolescence is the development of a substance-use disorder in adulthood (Grant & Dawson, 1997). While adolescents who wait until they are of legal drinking age to initiate alcohol use have a 10% chance of developing alcohol dependence later in life, the risk increases to 41% when adolescents initiate substance use prior to the age of 14 years (Grant & Dawson, 1997). Previous research has used retrospective data to show the strong relationship between age at first use of a substance and the risks associated with early onset substance use later in life. Anthony and Petronis (1995) found that adults who reported substance use prior to age 13 years were two times more likely to have a substance use disorder than adults who reported initiating substance use after the age of 17 years. These findings highlight the need to prevent students from engaging in substance using behaviors early in adolescence, when the risk for future problems is the greatest. This study also suggested that the risk factors for developing a substance use disorder later in life are already established by adolescent substance using behaviors.

Khantazin and Treece's (1985) review of adult clinical literature suggests that between 50-80% of individuals with a substance abuse disorder also meet criteria for another psychiatric diagnosis. Some psychiatric disorders commonly comorbid with substance abuse disorders include antisocial personality disorder, depression, and anxiety disorders.

Gil, Wagner, and Tubman's (2004) longitudinal study following 6,700 middle school students to early adulthood examined the relationship between substance use across ages along with psychiatric disorders. They found a strong relationship between adolescent substance use and substance use disorders in early adulthood. The rate of adult substance use disorders was almost 60% in the regular substance use group, higher than in the experimental group (42.7%) and the abstainers group (26.1%). These data suggest that adolescents who regularly used substances during early adolescence were 1.5 times more likely to be diagnosed with a substance use disorder in early adulthood than adolescents who only experimented with substances. Further, adolescents who abstained from substance use were half as likely to develop a substance use disorder as a young adult. Along with higher rates of substance use disorders, findings included higher rates of psychiatric disorders in adolescents who reported substance use in early adolescence. While differences were found between ethnicities, overall research has shown that engaging in substance use as an adolescent is a factor that can potentially increase the risk of psychiatric difficulties during adulthood.

Research clearly outlines the multiple negative outcomes associated with adolescent substance use that include both immediate and long-term consequences. Additionally, school related outcomes are also associated with adolescent substance use, including academic achievement.

### *Substance Use on Academic Achievement*

Substance use in adolescence has a negative effect on academic achievement. Cox, Zhang, Johnson, and Bender's (2007) study of 1,488 high school students found that adolescents who engage in using substances such as cigarettes, alcohol, and marijuana were more likely to be poor academic performers. Specifically, students who engaged in smoking cigarettes were about 2.5 times more likely to have grades of "C" or lower, while students who currently smoked marijuana were almost 2 times as likely to have grades of "C" or lower.

Similar results were yielded from a large study of adolescent students. The Substance Use and Mental Health Services Administration (DHHS/PHS) (2006) found in The National Survey on Drug Use and Health study of 59,649 students aged 12 to 17 years residing across the United States that students who use alcohol or drugs are at a greater risk for performing poorly in school. The researchers relied on self-report data from students who reported being enrolled in school. Specifically, among students who reported not having used alcohol in the past month, 72.5% reported having an "A" or "B" average. On the contrary, among the students who reported engaging in binge alcohol use over the past month, 42.3% reported having a grade point average of "C" or less. Similar results in grade point average were found in relation to marijuana use. Among students who reported not having smoked marijuana in the past month, 72.2% reported having an average grade of "A" or "B," while 55.1% of students who reported using marijuana five or more times over the course of the month reported having an average grade of "C" or less. While the directional relationship between adolescent substance use and academic achievement is still unclear, previous research has suggested that even moderate

involvement in substance use is related to poor academic achievement (Mandell, Hill, Carter, & Brandon, 2002).

Adolescents who engage in substance use behaviors are more likely to drop out of school before graduation (Mensch & Kandel, 1988). Dropping out has been shown to have significant negative effects on the individual. Students who drop out of school earn less than their peers who completed their high school education and are more likely to be unemployed. Aloise-Young and Chavez (2002) found in a study of 1,812 Mexican American and non-Hispanic White high school students from a southwestern state that nearly one-third of dropouts reported that substance use was an important contributor to their decision to leave school early.

The previous research cited has clearly shown the relationship between adolescent substance use and negative school-related consequences, including poorer academic achievement and an increased risk of dropping out of school. While research on the causal relationship between substance use and academic achievement is unclear, both substance use and poor academic achievement have been linked to numerous negative outcomes for adolescents. For this reason, it is critical that we identify risk factors for adolescent substance use.

#### *Risk factors for Substance Use*

*Peer influences.* Research has identified several risk factors for adolescent substance use. One risk factor is adolescents' involvement with negative peer influences. Peers serve as role models and provide access to substances. Additionally, the perception of peers using substances is a predictor of adolescents' decisions to engage in substance using behaviors (Chopak, Vicary, & Crockett, 1998).

Prinstein, Boergers, and Spirito's (2001) study of 527 high school students found that negative peer behaviors were predictors of substance use as well as other health risk behaviors. Adolescents' risky substance use behaviors, including binge drinking and marijuana use, were associated with peers' substance use and deviant behavior. Additionally, findings showed that the suicidal and deviant behaviors of peers were predictors of adolescents' own suicidal ideations and violent behavior. A cumulative risk factor model demonstrated that multiple risk factors significantly increased the likelihood that adolescents would engage in substance use and other health-risk behaviors.

A study that investigated the importance of peer influence and personal attitudes (e.g., expectancies, resistance, self-efficacy, and perceived harm) on substance use in 213 younger adolescents (aged 12-15 years) and 219 older adolescents (aged 18-22 years) found that peers' substance using behaviors were related to substance use for both age groups (Musher-Eizenman, Holub, & Arnett, 2003). However, differences were found between groups regarding their ability to resist peer pressure, as younger adolescents reported a lower ability to resist peer pressure than older adolescents.

*Parental Influence.* Another risk factor for adolescent substance use is parent substance use, as illustrated in a study of middle school students (Li, Pentz, & Chou, 2002). In this longitudinal study of 1,807 students, parent's non-use of substances protected against peers' influences to use substances and adolescents were better able to resist substance offers from peers. Specifically, adolescents whose parents reported no substance use were least likely to use substances, while adolescents with two parents who engaged in cigarette smoking were at the highest risk of smoking cigarettes, consuming alcohol, and using marijuana. Similar research focusing on the relationship between

parenting styles and adolescent substance use demonstrated that adolescent alcohol and tobacco use was associated with the adolescents' perception of lower authoritativeness and higher permissiveness (Cohen & Rice, 1997). The authors noted that agreement between parents and children on parenting styles was poor and that child perceptions of parenting styles were more strongly associated with substance use than the perception of parents.

*Extracurricular Activities.* Another risk factor for adolescent substance use is involvement in unsupervised after-school activities, as demonstrated in a large study of low income, at-risk Mexican American middle school students (Yin, Katims, & Zapata, 1996). In this study of middle school students, involvement in organized activities after school served as a protective factor against engaging in substance use. In a similar study, Shilts (1991) assessed the levels of substance use and involvement in extracurricular activities of 237 middle school students, finding that while substance abusers reported little to no involvement in extracurricular activities, adolescents who did not use substances reported higher involvement in extracurricular activities and spent more time with their families. The finding that adolescent substance users and abusers spent more time with their friends, while adolescents who did not use substances spent more time with their family, supports previous research suggesting that peer influences are important factors in initiating substance use (Musher-Eizenman et al., 2003). Additionally, this study is consistent with other empirical studies reporting that substance using adolescents spend more time involved in unstructured activities than their non-substance using peers (Cohen & Rice, 1997). Darling's (2005) study of 3,761 high school students from California found that while extracurricular activity participation is

associated with several positive outcomes in adolescents, including higher grades and academic aspirations and more positive attitudes towards school, participants and non-participants reported similar rates of alcohol use. However, students who participated in extracurricular activities reported lower levels of smoking, marijuana use, and use of other drugs compared to students who did not participate in extracurricular activities.

#### *Participation in athletic activities*

Although very little research has focused on the relationship between athletic participation in high school students and school-related outcomes, most research in this area has been positive (Fredricks & Eccles, 2006; Naylor et al., 2001). Currently, over 7 million high school students participate in some school-based athletic activity, representing nearly 54.2% of the population of high school students (National Federation of State High School Federations, 2007). With more high students involved in school-based athletics than ever before, it is critical that researchers examine the relationship between athletic participation and student outcomes.

Fredricks and Eccles's (2006) longitudinal study of 11<sup>th</sup> grade students examined the relationship between participation in a wide range of high school extracurricular activities and developmental outcomes in adolescence and young adulthood. In general, participation in clubs and organized school sports was associated with positive academic and psychological development, as well as decreased drug and alcohol use in the predominantly African American and European American sample. The researchers found more than half of the participants to be involved in school clubs (56%) and organized sports (55%), similar to previously mentioned statistics. After controlling for family demographic variables, Fredricks and Eccles (2006) found that participations in sports

predicted higher 11<sup>th</sup> grade GPAs ( $F= 5.46, p<.05$ ) and higher educational expectancies ( $F= 16.13, p<.001$ ) than those students who did not participate in sports. Sports participation also predicted psychological adjustment as athletes reported lower levels of depression and internalizing behaviors, and higher levels of self-esteem than nonathletes. Additionally, male athletes reported lower levels of externalizing behaviors than male nonathletes. These results were not found for female athletes and nonathletes. Regarding substance use, athletes reported lower alcohol use ( $F= 4.45, p<.05$ ) than individuals not involved in athletics and marijuana use was moderated by two factors; gender and race. For example, while participation in athletics predicted lower marijuana use in 11<sup>th</sup> grade for boys and European Americans, participation in athletics did not predict lower marijuana use for girls and African Americans. Athletic participation in 11<sup>th</sup> grade also predicted positive outcomes after high school. Data collected one year after high school graduation found that adolescents in sports in 11<sup>th</sup> grade completed significantly more schooling after graduation than nonathletes, even after controlling for family demographics, achievement-related motivation, educational expectancies, and GPA. Finally, the researchers stated that the number of activities participated in at 11<sup>th</sup> grade was positively associated with their indicators of academic and psychological adjustment. These findings suggest that high school students' participation in more activities predicted higher grades, educational expectancies, and years of schooling after graduation. However, the number of activities participated in was moderated by gender for several measures, including alcohol and marijuana use at 11<sup>th</sup> grade. Although the number of activities participated in was associated with lower alcohol and marijuana use at 11<sup>th</sup> grade for boys and girls, the relationship was much stronger for boys. These

findings clearly suggest that athletic involvement, as well as the time commitment needed to be involved in several activities, serves a protective factor against substance use and predicts several educational and psychological outcomes.

Naylor, Gardner, and Zaichkowsky's (2001) study examining the drug use patterns of 1,515 high school athletes and nonathletes in a northeastern state reported results similar to the previously mentioned study. The researchers used a 150-item questionnaire in order to examine the substance use patterns of students at 15 high schools. Athletes, defined as students who participated on any state-sanctioned interscholastic athletic team, reported lower usage levels than nonathletes for many drugs. Specifically, the researchers used chi-square analyses to find that nonathletes reported statistically higher levels of cigarette smoking ( $\chi^2= 7.455, p< .01$ ), cocaine use ( $\chi^2= 11.49, p< .01$ ), and psychedelics ( $\chi^2= 18.38, p<.001$ ), with greater frequency. Additionally, nonathletes reported higher rates of marijuana, amphetamine, and barbiturate use than athletes, though the differences were not statistically significant. The researchers also found that the only substance athletes used significantly more than nonathletes was creatine ( $\chi^2= 7.455, p<.01$ ). Regarding alcohol, rates of use were almost identical for athletes (68.8%) and nonathletes (68.4%), possibly due to the social acceptance of alcohol, as opposed to marijuana and other illicit drug use.

While several studies in the area of high school athletics have shown a relationship between athletic participation and decreased substance use, other studies have found contrasting results. In a study of 891 8<sup>th</sup> grade students, Moore and Werch (2005) found that the relationship between athletic participation and substance use often depended on gender and the specific sports that students were engaged in. For example,

the authors reported that females who participated in dancing, cheerleading, and gymnastics were at a decreased risk of substance use, while males who participated in football, swimming, and wrestling were at an increased risk for substance use. The authors note that it is important to examine substance use rates among athletes engaged in different sports. While this study highlights the relationship between participation in various athletic activities and substance use, it is important to note that a causal relationship between athletic participation and substance use has not been established.

Research examining the relationship between athletic participation and substance use among high school students has suggested that athletic involvement is associated with lower usage of most substance than nonathletes. With such a large number of students currently participating in school-based athletics than ever before, this offers practitioners with a potential protective factor against substance use in adolescents.

### *Conclusion*

Adolescent substance use has been associated with numerous negative outcomes in various areas, including academics, health, and increased risk for future dependency. Given that research has suggested that initiation of substance using behaviors during adolescence increases the likelihood that the individual will develop a substance use disorder, it is important to identify a range of predictors that are related to the initiation of substance use. Previous research has demonstrated that athletic involvement is associated with decreased substance use. With the numerous negative outcomes associated with adolescent substance use, participating in extracurricular activities and athletics might result in lower substance using behaviors among high school students.

To date, the majority of research on athletics and substance use in high school students has focused on athletics as a whole, ignoring potential differences between frequency and setting of athletic activities. This research contributes to existing literature by examining the relationship between common athletic activities in high school and rates of substance use.

## Chapter Three

### Method

The following chapter begins with a discussion of the participants involved in this study, the methods used to select participants, and the methods used to collect data. The variables that were examined in this study are also reviewed. Then, the measures used to collect data are discussed. Finally, the data analysis procedures used in this study are presented.

#### *Participants*

Participants for this study consisted of students enrolled in grades nine through twelve in a large, public high school within the Hillsborough County Public School District (HCPS). This particular high school was chosen because the researchers had access to the school site. Additionally, this school has a low graduation rate and the school's administrators were interested in learning more about potential risk and protective factors that may exist for students. The data used in the current study were part of a larger study investigating the overall substance use of high school students in relation to various educational and psychosocial outcomes.

Approval to conduct the study was obtained from the University of South Florida (USF) Division of Research Integrity and Compliance in August of 2008. Additionally, approval for the study was granted by the HCPS Department of Assessment and Accountability before data collection commenced. Data were collected in October of

2008 by a research team comprised of graduate students from USF. A faculty member of the School Psychology Program at USF served as the principal investigator of the larger study and supervised data collection.

After data collection was completed, descriptive statistics were conducted to obtain information about the demographic characteristics of the sample. Of the 139 students who participated in the study, 73.4% ( $n = 102$ ) were female and 26.6% ( $n = 37$ ) were male. Since the research was conducted in a primarily low-socioeconomic status (SES) and predominantly Hispanic high school, information on SES and ethnicity was also collected. Almost 70% ( $n = 96$ ) of the sample reported that they received free/reduced lunch, which was used as an indicator of SES in this study. Additionally, about 57% ( $n = 79$ ) of the sample reported Hispanic as their ethnicity. Since athletic participation was an area of interest in this study, information on student participation in athletic activities was also collected. About one-third (33.8%) of the sample reported participating on a school-based athletic team and 87.8% of the sample reported participating in an athletic activity in at least one setting (recreational, school). A more detailed report of the demographic data of the sample is presented in Table 1.

Table 1

*Demographic Information (N = 139)*

<i>Variable</i>	<i>n sample</i>	<i>% of sample</i>	<i>N school</i>	<i>% of school</i>
Gender				
Male	37	26.6	858	48.0%
Female	102	73.4	928	52.0%

Table 1 (continued)

*Demographic Information (N = 139)*

<i>Variable</i>	<i>n sample</i>	<i>% of sample</i>	<i>N school</i>	<i>% of school</i>
<b>Grade</b>				
9 <sup>th</sup>	43	30.9	543	30.4%
10 <sup>th</sup>	26	18.7	474	26.5%
11 <sup>th</sup>	31	22.3	433	24.2%
12 <sup>th</sup>	39	28.1	336	18.8%
<b>Ethnicity</b>				
African-American	12	8.6	174	9.7%
Asian/Pacific Islander	10	7.2	30	1.7%
Hispanic	79	56.8	1158	64.8%
Native American	1	0.7	5	0.3%
White	29	20.9	314	17.6%
Other	8	5.8	105	5.9%
<b>SES<sup>a</sup></b>				
Low	96	69.6	1193	66.8%
High	42	30.4	593	33.2%

*Note.* <sup>a</sup>SES (socioeconomic status) was determined by asking students to report whether or not they receive free/reduced school lunch.

*Selection of participants*

The high school in which the study took place is considered to be a predominantly low socioeconomic status (SES) school due to the percentage of students attending the

school that qualify for free or reduced lunch. Specifically, at this school 70% of students qualify for free or reduced lunch compared to the state average of 45.8% (Florida Department of Education, 2007). To ensure that only students who fit the criteria for participation were included in this study, parental consent forms were only delivered to students in standard diploma classes who had English listed as their primary language or were proficient in English. Therefore, parental consent forms were not distributed to students who were English Language Learners (ELL), classified as LYA (do not speak English), or classified as LYB (bilingual students, but not predominantly English speaking). Students served exclusively in self-contained special education classrooms were also excluded due to higher incidences of low reading skills impacting the accurate completion of the survey. Finally, students who were absent on the dates of data collection were excluded. Of the school's population, about 1,100 students met the criteria outlined above and were eligible to participate in the survey. Of the 139 students who returned parental consent forms, all decided to complete student assent forms and participate in the survey. This represents a return rate of about 13%, which is relatively low for participation in survey research. For example, when Ji, Pokorny, and Jason (2004) studied factors influencing return rates of parental consent forms, they found the average return rate for high school students was almost 57%. While students were not paid for participation in this study, the researchers offered participants the opportunity to win one of four, \$50 Best Buy gift cards as an incentive for participation. Participants were randomly selected from the list of students who returned parental assent forms and signed student assent forms.

### *Data Collection Procedures*

Prior to data collection, details of the study were given during scheduled English classes. English teachers were provided with parental consent forms, which were distributed to all students who met the criteria outlined above. Active parental consent was required for participation in this study. Active parental consent requires parents to sign a participation form which outlines the details of the study, as well as risks and benefits associated with participation. Due to the large Hispanic population at this particular high school, parental consent forms were available in both English (see Appendix A) and Spanish (see Appendix B). The parental consent forms included information about the current study, as well as the principal investigator's contact information. Parents were encouraged to contact to principal investigator to discuss any questions or concerns about their child's participation in the study. The parental consent form highlighted that student participation was entirely voluntary and that all information collected during the study was confidential and would not be shared with teachers or administrators. Students returned signed parental consent forms to teachers, who then delivered them to the principal investigator by placing the forms in a mailbox in the teacher mailroom. The principal investigator used these signed parental consent forms to compile a list of eligible participants.

Data collection took place over a three day period in October 2008. The researchers involved in this study escorted small groups of students (approximately 8-10 students) from class to an empty conference room designated by a school administrator. Researchers involved in this study included the primary investigator of the current study (a USF School Psychology program graduate student) and three other USF research

assistants (also USF School Psychology program graduate students). Due to the sensitive nature of some of the questions in the survey packet, participants were seated such that at least one seat was between each student. The students were seated this way because the researchers did not want participants to be able to look at the survey packets of other participants and wanted participants to feel more comfortable and respond honestly to the survey questions.

Prior to handing out surveys, the one member of the research team read the student assent form (see Appendix C) aloud to the participants. The student assent form described the purpose of the study and outlined the potential risks and benefits of participation. Students were made aware that their participation was entirely voluntary, that they were free to leave the study at any time, and that their responses were confidential and would not be shared with any teachers or administrators. Students were also notified that a research team member would quickly look over surveys to ensure that students did not inadvertently skip any questions. At this time, students were allowed to ask the researchers any questions they had about the study and their involvement. After participants signed the assent forms, a member of the research team collected each of the forms. These forms were then placed in a filing cabinet in the principal investigator's office. After all student assent forms had been collected, research team members distributed survey packets to each of the participants. Students were instructed to raise their hand when they were finished with the entire survey packet and a research team member would pick up their packet.

All survey measures were counterbalanced to control for order effects using versions "1" through "4". Students were encouraged to ask questions if any items were

unclear. USF researchers were available to answer any questions from students throughout data collection. Upon handing in the survey packet, a USF researcher quickly examined the survey packet to check if the student had inadvertently missed any questions and/or made errors. If the student had made errors and/or skipped questions, he or she was asked to complete missed questions or correct any questions on which they made an error. When all participants in the small group completed their survey packet, the students were escorted back to their classrooms by a USF researcher.

### *Variables*

The researcher investigated the relationship between several variables and substance use. The independent variables that were investigated in this study included gender, ethnicity, grade level, and athletic involvement. Ethnicity was classified into four class groups: (a) African American/Black, (b) Hispanic, (c) White, and (d) Other. Athletic involvement was defined by using a 5-point Likert-type scale that assessed how often adolescents in this study participated in certain athletic activities, such as football, soccer, basketball, baseball/softball, and golf. The dependent variable for this study was substance use. Substances were classified into the following drug class groups: (a) alcohol (wine, beer, and liquor), (b) tobacco (cigarettes and cigars), (c) marijuana, and (d) other illicit drugs (i.e., inhalants, prescription drugs not prescribed to you, ecstasy, hallucinogens, stimulants, barbiturates, and cocaine).

### *Measures*

A survey packet, comprised of 14 separate scales, was developed to obtain information about high school students to be used in several smaller studies. The survey packet was comprised of scales used in previous studies, as well as additional scales

developed to obtain information specific for this study. For the purpose of this study, responses from only three scales were examined. Additional scales in the survey packet were included to be used in studies conducted by other members of the research team, but were not used for the purpose of this study. The three scales that were used in this study are described below. The entire survey packet was piloted to assess completion time and readability with 20 HCPS high school students enrolled in an Honors Psychology class. No questions regarding readability were reported and time of completion was approximately 20-30 minutes. Due to concerns about the representation of students in the first round of pilot testing (i.e., only including students enrolled in an honors level course), additional pilot testing was conducted with students from a general education English class. Similar to the first round of pilot testing, no questions regarding readability were reported by participants and time of completion was approximately 25-30 minutes. After pilot testing, all surveys completed during pilot testing were filed in a locked filing cabinet and data were not recorded. The three scales used specifically for this study are described below.

*Demographics Questionnaire.* Students completed a demographics questionnaire in order for the researchers to gather information about the students in this study (see Appendix D). Participants reported information relevant to this study, including their gender, ethnicity, age, grade, estimated GPA, and whether they receive free or reduced lunch. Additionally, the questionnaire included other items relevant to the larger study, including school attendance, estimated GPA, frequency of behavioral discipline referrals in the past year, frequency of out of school suspensions in the past year, frequency of arrests in the past year, past diagnoses of mental health problems, and past history of

medications for mental health problems. All questions were close ended, with the exception of the item for Ethnicity. The Ethnicity item allowed participants to fill in their answer under the “other” category if none of the listed responses (e.g., African American/Black, White/Caucasian, Hispanic) best represented their ethnicity.

*Participation in Athletic Activities Scale.* In order to gather information about participation in various athletic activities, students completed a 16-item Athletic Activities Scale created for this study (See Appendix E). The scale included a list of various sports that high school students are commonly involved in and asked them to report how often they participated in the various activities. The scale utilized a 5-point Likert scale, in which 1= never, 2= less than once a month, 3= once or twice a month, 4= once or twice a week, and 5= three or more times a week. Additionally, the scale asked students to report in which setting(s) they participated in each activity (i.e., recreational, club, school team). The Participation in Athletic Activities Scale was developed by the principal investigator for the purpose of this study. The principal investigator collaborated with members of the research team involved in this study, including USF graduate students and a school psychologist. The scale was developed in order to provide information on the settings in which students participated in the various athletic activities. The reliability and validity of the Athletic Activities Scale has not been previously examined. For the purpose of this study, athletes are defined as students who reported participating on any state-sanctioned interscholastic athletic team (Naylor et al., 2001).

*Adolescent Substance Use Scale.* In order to measure how often participants used various substances, students completed a 17-item Substance Use Scale (see Appendix F). The scale consisted of a list of commonly used substances (e.g., cigarettes/cigars,

chewing tobacco, wine/wine coolers/malt beverages, beer, liquor, marijuana, inhalants, OTC drugs, cocaine, crack) as well as a 7-point Likert-type scale measuring how many occasions the participant has used each substance in the past 12 months. The scale was scored as follows: 1= zero occasions, 2= one to two occasions, 3= three to five occasions, 4= six to nine occasions, 5= 10 to 19 occasions, 6= 20 to 39 occasions, and 7= 40 or more occasions. The Adolescent Substance Use Scale was developed by the principal investigator and members of a graduate research team for the purpose of this study. Since this study focused on the substance use rates of athletes, the principal investigator wanted to examine the rates of steroid use in this population. The scale was developed to include steroids in the list of substances. When developing this scale, the research team members consulted previously developed substance use scales, as well as colleagues who have previously conducted research examining substance use in adolescents. The reliability and validity of the Adolescent Substance Use Scale has not been previously examined. In order to evaluate the internal consistency reliability of these measures, reliability analyses were conducted. The Cronbach alpha for all of the items on the Adolescent Substance Use Scale was 0.866. For the three items used to construct the Alcohol variable (i.e., wine, beer, liquor) in the current study, the Cronbach alpha was 0.888. Finally, the Cronbach alpha for the seven items used to construct the Other Drugs variable (i.e., inhalants, prescription drugs not prescribed to you, ecstasy, hallucinogens, stimulants, barbiturates, and cocaine) was 0.734.

#### *Data Analysis*

A series of statistical analyses were conducted in order to answer the research questions for this study.

Question 1:

*What is the rate of student substance use with respect to the following drug groups?*

*A) Alcohol (wine, beer, and liquor)*

*B) Tobacco (cigarettes and cigars)*

*C) Marijuana*

*D) Other drugs (i.e., inhalants, prescription drugs not prescribed to you, ecstasy, hallucinogens, stimulants, barbiturates, and cocaine)*

*Descriptive analyses.* Frequencies were obtained for all variables of interest with respect to substance use. For all of the substances, frequency distributions were presented using items such as “in the past 12 months, on how many occasions have you used alcohol or the following drugs?”: (1) zero occasions, (2) one to two occasions, (3) three to five occasions, (4) six to nine occasions, (5) 10 to 19 occasions, (6) 20 to 39 occasions, and (7) 40 or more occasions.

Question 2:

*Are there differences in drug and/or alcohol use among adolescent athletes and non-athletes?*

*Chi-square analyses.* In order to determine the potential differences between athletes and non-athletes in relation to substance use, chi-square tests were conducted. These chi-square tests examined the relationship between athletic participation and use of the four drug groups identified in question one. For the purpose of this question, both variables were coded as categorical variables. Athletes were defined as any students who reported playing on a school-sponsored athletic team, while non-athletes were defined as

any students who did not report playing on a school-sponsored athletic team.

Additionally, substance use was defined as reporting use of a particular substance at least one time in the past 12 months, while non-use was defined as reporting never using a particular substance in the past 12 months. Substance use in the past 12 months was examined using the four drug groups identified in question 1.

Question 3:

*Are there gender and/or ethnicity differences in drug and/or alcohol use among adolescent athletes and nonathletes?*

*Logistic Regression analyses.* Logistic regression analysis was used because the dependent variables (alcohol use, tobacco use, marijuana use, other drug use) were recoded as categorical variables (used in the past 12 months vs. not used in the past 12 months). Logistic regression analyses were used to predict which category a person belongs to (used substance vs. not used substance) based on other variables (i.e., gender, race, athlete status). In order to examine potential moderator variables in the logistic regression analyses, interaction terms were created and analyzed. The analyses of interaction terms were used to determine if there were interactions between different levels of the independent variables (i.e., gender, race, athlete status). Additionally, the main effects were analyzed to determine gender, race, and athlete status were related to substance use.

Question 4:

*Are there relationships between the frequency and setting of athletic participation and adolescent substance use?*

*Logistic Regression analyses.* Logistic regression analysis was used because the dependent variables (alcohol use, tobacco use, marijuana use, other drug use) were recoded as categorical variables (used in the past 12 months vs. not used in the past 12 months). Logistic regression analyses were used to predict which category a person belongs to (used substance vs. not used substance) based on frequency of athletic participation and setting of athletic participation. In order to examine potential moderator variables in the logistic regression analyses, interaction terms were created and analyzed. The analyses of interaction terms were used to determine if there were interactions between different levels of the independent variables (i.e., frequency of athletic participation, setting of athletic participation). Additionally, the main effects were analyzed to determine if frequency of athletic participation and setting of athletic participation were related to substance use.

## Chapter Four

### Results

#### *Treatment of the Data*

Survey data were entered from the completed survey packets into an SPSS database by the primary investigator. Data were checked for possible errors. First, the data were checked for scores that were outside the possible range of scores based on the Likert-scales used in each survey. For example, the possible range of scores for the Adolescent Substance Use Scale was 1 (Never) to 7 (40 or more times). A score below 1 or above 7 would have been out of the possible range for this scale. No scores were found to be outside the possible range for any of the scales used in this study. Another member of the research team checked a random 15% of the survey packets that were entered into the SPSS database. Specifically, the research team member checked to make sure that the data entered into the SPSS database matched the data reported on the survey. If an error was detected, the member of the research team corrected the error in the database by entering the correct survey response into the SPSS database. Of the 139 survey packets that were entered into the database, only 5 errors were recorded and corrected in the database. After data was entered and checked by research team members, all completed surveys were stored in a locked filing cabinet in the principal investigator's office.

### *Descriptive Analyses*

Descriptive analyses were conducted to obtain the means and standard deviations of all variables. To assess univariate normality of variables, skewness and kurtosis were examined. Since the skewness and kurtosis values for the dependent variables of alcohol, tobacco, marijuana, and other drugs were all outside of the normal range of -2.00 to 2.00, the dependent variables were dichotomized (0 = Did not use the substance in the past 12 months, 1 = Used the substance in the past 12 months) due to non-normality. The dichotomized forms of data for alcohol, tobacco, marijuana, and other drugs were used for all subsequent chi-squared and logistic regression analyses. Skewness and kurtosis values for the independent variables of athlete status and frequency of athletic participation were all within the normal range of -2.00 to 2.00.

### *Frequency of Adolescent Substance Use*

*Research Question #1.* What is the rate of student substance use with respect to the following drug groups?

- A) Alcohol (wine, beer, and liquor)
- B) Tobacco (cigarettes and cigars)
- C) Marijuana
- D) Other drugs (i.e., inhalants, prescription drugs not prescribed to you, ecstasy, hallucinogens, stimulants, barbiturates, and cocaine)

Before examining the rate of student use, the present researcher wanted to determine the relationships between each of the four drug groups. Analyses were conducted in order to determine the intercorrelations between each of the four drugs

groups. These analyses indicated that all four of the drug groups were significantly correlated. A detailed report of the correlation analyses are presented in Table 2.

Table 2

*Intercorrelations Between Substance Use Groups (N = 139)*

Substance Use Group	1	2	3	4
1. Alcohol	-	.361*	.404*	.244*
2. Tobacco		-	.564*	.427*
3. Marijuana			-	.418*
4. Other Drugs				-

Note. \* $p < .01$ .

In order to determine the use rates of specific substances, frequency distributions were calculated. Substance use rates are presented in Table 3 by gender.

Table 3

*Rates of Substance Use in Past 12 Months by Type and Gender (N = 139)*

Substance	<u>Males(n=37)</u>		<u>Females (n=109)</u>		<u>Total (n=139)</u>	
	N	%	N	%	N	%
<b>Cigarettes</b>						
None	31	83.8	85	83.3	116	83.5
1-2 times	3	8.1	6	5.9	9	6.5
3-5 times	1	2.7	1	1.0	2	1.4
6-9 times	-	-	4	3.9	4	2.9
10-19 times	-	-	1	1.0	1	.7

Table 3 (continued)

*Rates of Substance Use in Past 12 Months by Type and Gender (N = 139)*

Substance	<u>Males (n=37)</u>		<u>Females (n=109)</u>		<u>Total n=139</u>	
	N	%	N	%	N	%
20-39 times	-	-	1	1.0	1	.7
40 or more times	2	5.4	4	3.9	6	4.3
<b>Chewing Tobacco</b>						
None	36	97.3	102	100.0	138	99.3
1-2 times	-	-	-	-	-	-
3-5 times	-	-	-	-	-	-
6-9 times	-	-	-	-	-	-
10-19 times	1	2.7	-	-	1	.7
20-39 times	-	-	-	-	-	-
40 or more times	-	-	-	-	-	-
<b>Wine/Wine Coolers</b>						
None	22	59.5	54	52.9	76	54.7
1-2 times	9	24.3	22	21.6	31	22.3
3-5 times	2	5.4	11	10.8	13	9.4
6-9 times	3	8.1	4	3.9	7	5.0
10-19 times	-	-	5	4.9	5	3.6

Table 3 (continued)

*Rates of Substance Use in Past 12 Months by Type and Gender (N = 139)*

Substance	<u>Males (n=37)</u>		<u>Females (n=102)</u>		<u>Total (n=139)</u>	
	N	%	N	%	N	%
20-39 times	1	2.7	3	2.9	4	2.9
40 or more times	-	-	3	2.9	3	2.2
<b>Beer</b>						
None	23	62.2	68	67.3	91	65.9
1-2 times	9	24.3	17	16.8	26	18.8
3-5 times	2	5.4	5	5.0	7	5.1
6-9 times	1	2.7	3	3.0	4	2.9
10-19 times	1	2.7	5	5.0	6	4.3
20-39 times	-	-	1	1.0	1	.7
40 or more times	1	2.7	2	2.0	3	2.2
<b>Liquor</b>						
None	23	62.2	61	60.4	84	60.9
1-2 times	5	13.5	15	14.9	20	14.5
3-5 times	3	8.1	8	7.9	11	8.0
6-9 times	1	2.7	2	2.0	3	2.2
10-19 times	3	8.1	4	4.0	7	5.1

Table 3 (continued)

*Rates of Substance Use in Past 12 Months by Type and Gender (N = 139)*

Substance	<u>Males (n=37)</u>		<u>Females (n=102)</u>		<u>Total (n=139)</u>	
	N	%	N	%	N	%
20-39 times	1	2.7	7	6.9	8	5.8
40 or more times	1	2.7	4	4.0	5	3.6
<b>Marijuana</b>						
None	31	83.8	81	80.6	112	80.6
1-2 times	3	8.1	5	5.8	8	5.8
3-5 times	1	2.7	5	4.3	6	4.3
6-9 times	-	-	1	.7	1	.7
10-19 times	-	-	3	2.9	3	2.2
20-39 times	1	2.7	2	2.0	3	2.2
40 or more times	1	2.7	5	4.9	6	4.3
<b>Inhalants</b>						
None	35	94.6	93	92.1	128	92.8
1-2 times	1	2.7	3	3.0	4	2.9
3-5 times	-	-	3	3.0	3	2.2
6-9 times	-	-	1	1.0	1	.7
10-19 times	-	-	1	1.0	1	.7

Table 3 (continued)

*Rates of Substance Use in Past 12 Months by Type and Gender (N = 139)*

Substance	<u>Males (n=37)</u>		<u>Females (n=102)</u>		<u>Total (n=139)</u>	
	N	%	N	%	N	%
20-39 times	-	-	-	-	-	-
40 or more times	1	2.7	-	-	1	.7
OTC: Not Sick						
None	35	94.6	93	91.2	128	92.1
1-2 times	-	-	-	-	-	-
3-5 times	-	-	3	2.9	3	2.2
6-9 times	-	-	1	1.0	1	.7
10-19 times	-	-	-	-	-	-
20-39 times	2	5.4	2	2.0	4	2.9
40 or more times	-	-	3	2.9	3	2.2
Rx: Not Rx to you						
None	34	91.9	90	88.2	124	89.2
1-2 times	1	2.7	5	4.9	6	4.3
3-5 times	1	.7	2	1.4	3	2.2
6-9 times	-	-	2	2.0	2	1.4
10-19 times	-	-	-	-	-	-

Table 3 (continued)

*Rates of Substance Use in Past 12 Months by Type and Gender (N = 139)*

Substance	<u>Males (n=37)</u>		<u>Females (n=102)</u>		<u>Total (n=139)</u>	
	N	%	N	%	N	%
20-39 times	-	-	1	1.0	1	.7
40 or more times	1	2.7	2	2.0	3	2.2
Rx: To you						
None	28	75.7	80	78.4	108	77.7
1-2 times	2	5.4	7	6.9	9	6.5
3-5 times	3	8.1	6	5.9	9	6.5
6-9 times	2	5.4	6	5.9	8	5.8
10-19 times	-	-	1	1.0	1	.7
20-39 times	-	-	1	1.0	1	.7
40 or more times	2	5.4	1	1.0	3	2.2
Steroids						
None	37	100.0	101	99.0	138	99.3
1-2 times	-	-	1	1.0	1	.7
3-5 times	-	-	-	-	-	-
6-9 times	-	-	-	-	-	-
10-19 times	-	-	-	-	-	-

Table 3 (continued)

*Rates of Substance Use in Past 12 Months by Type and Gender (N = 139)*

Substance	<u>Males (n=37)</u>		<u>Females (n=102)</u>		<u>Total (n=139)</u>	
	N	%	N	%	N	%
20-39 times	-	-	-	-	-	-
40 or more times	-	-	-	-	-	-
Ecstasy						
None	35	94.6	99	97.1	134	96.4
1-2 times	-	-	2	2.0	2	1.4
3-5 times	1	2.7	-	-	1	.7
6-9 times	-	-	1	1.0	1	.7
10-19 times	-	-	-	-	-	-
20-39 times	-	-	-	-	-	-
40 or more times	1	2.7	-	-	1	.7
Hallucinogens						
None	34	91.9	100	98.0	134	96.4
1-2 times	1	2.7	1	1.0	2	1.4
3-5 times	1	2.7	1	1.0	2	1.4
6-9 times	1	2.7	-	-	1	.7
10-19 times	-	-	-	-	-	-

Table 3 (continued)

*Rates of Substance Use in Past 12 Months by Type and Gender (N = 139)*

Substance	<u>Males (n=37)</u>		<u>Females (n=102)</u>		<u>Total (n=139)</u>	
	N	%	N	%	N	%
20-39 times	-	-	-	-	-	-
40 or more times	-	-	-	-	-	-
<b>Stimulants</b>						
None	34	91.9	98	96.1	132	95.0
1-2 times	-	-	1	1.0	1	.7
3-5 times	2	5.4	-	-	2	1.4
6-9 times	-	-	1	1.0	1	.7
10-19 times	1	2.7	1	1.0	2	1.4
20-39 times	-	-	1	1.0	1	.7
40 or more times	-	-	-	-	-	-
<b>Barbituates</b>						
None	36	97.3	100	98.0	136	97.8
1-2 times	-	-	-	-	-	-
3-5 times	-	-	1	1.0	1	.7
6-9 times	-	-	-	-	-	-
10-19 times	-	-	-	-	-	-

Table 3 (continued)

*Rates of Substance Use in Past 12 Months by Type and Gender (N = 139)*

Substance	<u>Males (n=37)</u>		<u>Females (n=102)</u>		<u>Total (n=139)</u>	
	N	%	N	%	N	%
20-39 times	-	-	1	1.0	1	.7
40 or more times	1	2.7	-	-	1	.7
<b>Meth</b>						
None	37	100.0	101	99.0	138	99.3
1-2 times	-	-	1	1.0	1	.7
3-5 times	-	-	-	-	-	-
6-9 times	-	-	-	-	-	-
10-19 times	-	-	-	-	-	-
20-39 times	-	-	-	-	-	-
40 or more times	-	-	-	-	-	-
<b>Crack</b>						
None	36	97.3	102	100.0	138	99.3
1-2 times	-	-	-	-	-	-
3-5 times	-	-	-	-	-	-
6-9 times	-	-	-	-	-	-
10-19 times	1	2.7	-	-	1	.7

Table 3 (continued)

*Rates of Substance Use in Past 12 Months by Type and Gender (N = 139)*

Substance	<u>Males (n=37)</u>		<u>Females (n=102)</u>		<u>Total (n=139)</u>	
	N	%	N	%	N	%
20-39 times	-	-	-	-	-	-
40 or more times	-	-	-	-	-	-
Cocaine						
None	36	97.3	98	96.1	134	96.4
1-2 times	-	-	1	1.0	1	.7
3-5 times	-	-	-	-	-	-
6-9 times	-	-	-	-	-	-
10-19 times	1	2.7	2	2.0	3	2.2
20-39 times	-	-	1	1.0	1	.7
40 or more times	-	-	-	-	-	-
Heroin						
None	37	100.0	101	100.0	138	100.0
1-2 times	-	-	-	-	-	-
3-5 times	-	-	-	-	-	-
6-9 times	-	-	-	-	-	-
10-19 times	-	-	-	-	-	-

Table 3 (continued)

*Rates of Substance Use in Past 12 Months by Type and Gender (N = 139)*

Substance	<u>Males (n=37)</u>		<u>Females (n=102)</u>		<u>Total (n=139)</u>	
	N	%	N	%	N	%
20-39 times	-	-	-	-	-	-
40 or more times	-	-	-	-	-	-
Other						
None	17	100.0	37	92.5	54	94.7
1-2 times	-	-	1	2.5	1	1.8
3-5 times	-	-	1	2.5	1	1.8
6-9 times	-	-	-	-	-	-
10-19 times	-	-	-	-	-	-
20-39 times	-	-	-	-	-	-
40 or more times	-	-	1	2.5	1	1.8

Overall, the majority of participants reported using at least one substance in the past year. When examining the reported substance use rates, the most commonly used substance was alcohol. Over half (55.4%) of the participants in this study reported using alcohol at least once in the past 12 months. With regard to the other substance groups, 19.4% of participants reported using marijuana in the past 12 months and 16.5% reported using tobacco or other drugs at least once in the past 12 months. Heroin was the only illicit substance that was reported as not used by any participants. There were no

significant gender differences in reported rates of use for a specific substance. In other words, neither males nor females reported significantly higher rates of a particular substance.

#### *Athletic Participation and Substance Use*

*Research Question #2.* Are there differences in drug and/or alcohol use among adolescent athletes and non-athletes?

Before examining potential differences in substance use among athletes and nonathletes, the present researcher conducted frequency analyses to determine the percent of athletes by grade, gender, ethnicity, and SES. The results of these frequency analyses are presented in Table 4, Table 5, Table 6, and Table 7, respectively.

Table 4

#### *Frequency Analysis: Athlete Status by Grade (N = 139)*

<i>Grade</i>	<i>Athlete n</i>	<i>Athlete %</i>	<i>Nonathlete n</i>	<i>Nonathlete %</i>
9 <sup>th</sup>	9	20.9%	34	79.1%
10 <sup>th</sup>	7	26.9%	19	73.1%
11 <sup>th</sup>	11	35.5%	20	64.5%
12 <sup>th</sup>	20	51.3%	19	48.7%
Total	47	33.8%	92	66.2%

Table 5

*Frequency Analysis: Athlete Status by Gender (N = 139)*

<i>Gender</i>	<i>Athlete n</i>	<i>Athlete %</i>	<i>Nonathlete n</i>	<i>Nonathlete %</i>
Male	14	37.8%	23	62.2%
Female	33	32.4%	69	67.6%
Total	47	33.8%	92	66.2%

Table 6

*Frequency Analysis: Athlete Status by Ethnicity (N = 139)*

<i>Ethnicity</i>	<i>Athlete n</i>	<i>Athlete %</i>	<i>Nonathlete n</i>	<i>Nonathlete %</i>
African-American	5	41.7%	7	58.3%
Hispanic	28	35.4%	51	64.6%
White	8	27.6%	21	72.4%
Other	6	31.6%	13	68.4%
Total	47	33.8%	92	66.2%

Table 7

*Frequency Analysis: Athlete Status by Socioeconomic Status (SES) (N = 139)*

<i>Grade</i>	<i>Athlete n</i>	<i>Athlete %</i>	<i>Nonathlete n</i>	<i>Nonathlete %</i>
High Ses	11	26.2%	31	73.8%
Low SES	36	37.5%	60	62.5%
Total	47	33.8%	92	66.2%

In order to determine whether potential differences existed between athletes and nonathletes with respect to substance use, chi-square analyses were conducted. An alpha level of .05 was used to determine statistical significance. The results of the chi-squared analyses are presented in Table 8.

Table 8

*Chi-Squared Analysis: Substance Use and Athlete Status (N = 139)*

<i>Substance</i>	<i>Athlete</i>		$\chi^2$	<i>df</i>	<i>p</i>
	<i>Yes</i>	<i>No</i>			
Alcohol	61.7%	52.2%	1.143	1	.285
Tobacco	8.5%	20.7%	3.321	1	.068
Marijuana	10.6%	23.9%	3.502	1	.061
Other Drugs	10.6%	19.6%	1.795	1	.180

Initial chi-squared analyses indicated that there were no differences in athlete status between males and females,  $\chi^2(1, N = 139) = .361, p = .549$ . Therefore, gender was collapsed for the purpose of subsequent chi-squared analyses. Chi-squared analyses indicated that no significant differences existed between athletes and nonathletes for alcohol,  $\chi^2(1, N = 139) = 1.143, p = .285$ , tobacco,  $\chi^2(1, N = 139) = 3.321, p = .068$ , marijuana,  $\chi^2(1, N = 139) = 3.502, p = .061$ , and other drugs,  $\chi^2(1, N = 139) = 1.795, p = .180$ . Although differences in substance use rates were not statistically significant, more athletes (61.7%) reported having used alcohol in the past 12 months compared to nonathletes (52.2%). Conversely, nonathletes reported slightly higher rates of tobacco use

(20.7% vs. 8.5%), marijuana use (23.9% vs. 10.6%), and other drug use (19.6% vs. 10.6%) in the past 12 months than athletes, though not statistically significant.

#### *Gender and Ethnicity and Substance Use*

*Research Question #3.* Are there gender and/or ethnicity differences in drug and/or alcohol use among adolescent athletes and nonathletes?

In order to test differences in substance use by gender, ethnicity, and athlete status, logistic regression analyses were conducted. For each of the four substance groups (alcohol, tobacco, marijuana, other drugs), analyses were conducted to determine if any of the two way interactions between the independent variables (gender, ethnicity, athlete status) were significant. Since analyses indicated that no interaction effects were statistically significant, only main effects from the logistic regression analyses were reported. Results from this logistic regression analyses are presented in Table 9.

Table 9.

*Logistic Regression Analysis: Substance Use and Athlete Status by Gender and Ethnicity (N = 139)*

	Alcohol	Tobacco	Marijuana	Other Drugs
<i>Athlete vs. Nonathlete</i>	.172 (.400)	-1.009 (.600)	-1.141* (.569)	-.864 (.571)
<i>Male</i>	.317 (.423)	.046 (.539)	-.162 (.541)	.308 (.522)
<i>Ethnicity</i>				
African American	-.835 (.674)	-.049 (.877)	-.558 (1.114)	-.573 (1.121)

Table 9 (continued)

*Logistic Regression Analysis: Substance Use and Athlete Status by Gender and Ethnicity (N = 139)*

	Alcohol	Tobacco	Marijuana	Other Drugs
White	-.227 (.476)	.219 (.580)	.505 (.549)	-.025 (.607)
Other	-.1016 (.549)	-.633 (.824)	-1.450 (1.078)	-.053 (.720)
SES	.540 (.409)	-.119 (.513)	.754 (.547)	.291 (.545)
<i>Grade</i>				
9 <sup>th</sup> Grade	-.503 (.497)	.142 (.664)	-.662 (.598)	-.725 (.671)
10 <sup>th</sup> Grade	-1.280* (.558)	.331 (.717)	-.098 (.626)	.298 (.636)
11 <sup>th</sup> Grade	-.471 (.529)	.435 (.693)	-1.222 (.753)	-.514 (.715)

*Note.* Log odd coefficients are reported and the standard error is reported in parentheses. Interaction terms were created, entered into a model, and analyzed. Since no significant interaction effects were found, only main effects are reported. Hispanic and 12<sup>th</sup> grade participants were used as the reference category.

\* $p < .05$ .

While no significant main effects were found for tobacco and other drug use, data indicated that a significant main effect was found when examining rates of marijuana use between athletes and nonathletes. Specifically, when gender, ethnicity, SES, and grade

were controlled for, nonathletes reported significantly more marijuana use in the past year than athletes (Log Odds Ratio = 1.141). Additionally, logistic regression analyses indicated that a significant main effect was found when examining rates of alcohol use by ethnicity. When the relationship between substance use and ethnicity was examined by itself, analyses indicated that a significant main effect for alcohol existed between Hispanic participants and students who reported their ethnicity as Other (Asian/Pacific Islander, Native American/Alaska Native, and Other). Specifically, Hispanic (75.0%) participants reported higher rates of alcohol use than participants who identified themselves as Other (33.0%) (Log Odds Ratio = .344). However, when gender, SES, and grade were controlled for, no significant differences in alcohol use existed between Hispanic participants and those who reported their ethnicity as Other. In addition to gender and ethnicity, the present researcher also examined additional potential demographic variables (i.e., SES, grade). While no significant differences in substance use emerged between high- and low-SES participants for any of the four substance groups, the relationship between grade and alcohol use was significant. Specifically, 12<sup>th</sup> grade participants reported significantly more alcohol use than 10<sup>th</sup> grade participants (Log Odds Ratio = 1.280). However, the relationship between grade and substance use was not significant for the three remaining substance groups (tobacco, marijuana, other drugs).

### *Frequency and Setting of Athletic Participation and Substance Use*

*Research Question #4.* Are there relationships between the frequency and setting of athletic participation and adolescent substance use?

Two separate logistic regression analyses also were conducted to test differences in substance use by frequency and setting of participation in an athletic activity. The first logistic regression analysis tested differences in substance use by frequency of athletic participation, while the second logistic regression analysis tested differences in substance use by setting of athletic participation. All 139 participants were included in these logistical regression analyses. These analyses examined the relationship between frequency and setting of athletic participation and substance use, regardless of athlete status.

For the logistic regression analysis for frequency, analyses were conducted for each of the four substance groups (alcohol, tobacco, marijuana, other drugs) and potential interactions between the levels of frequency were examined. For the purpose of these analyses, participants recorded how often they participated in athletic activities on a Likert-type scale (never, less than once a month, once or twice a month, once or twice a week, three or more times a week). Since analyses indicated that no significant interaction effects existed between the levels of the independent variable and substance use, only main effects were reported. Results from the logistic regression analysis are presented in Table 10.

Table 10

*Logistic Regression Analysis: Substance Use and Frequency of Athletic Participation (N = 138)*

	Alcohol	Tobacco	Marijuana	Other Drugs
<i>Frequency of Athletic Participation</i>	-.011 (.141)	.104 (.191)	-.081 (.173)	-.161 (.173)
<i>Male</i>	.327 (.422)	-.035 (.533)	-.262 (.531)	.284 (.517)
<i>Ethnicity</i>				
African American	-.810 (.671)	-.138 (.866)	-.667 (1.109)	-.596 (1.115)
White	-.237 (.476)	.277 (.580)	.561 (.538)	.026 (.604)
Other	-.1017 (.553)	-.557 (.819)	-1.516 (1.072)	-.102 (.712)
<i>SES</i>	.560 (.410)	-.215 (.514)	.688 (.546)	.258 (.546)
<i>Grade</i>				
9 <sup>th</sup> Grade	-.560 (.484)	.409 (.642)	-.409 (.571)	-.546 (.653)
10 <sup>th</sup> Grade	-1.325* (.551)	.541 (.698)	.105 (.602)	.449 (.619)
11 <sup>th</sup> Grade	-.505 (.526)	.581 (.676)	-1.070 (.728)	-.421 (.701)

*Note.* Log odd coefficients are reported and the standard error is reported in parentheses. Interaction terms were created, entered into a model, and analyzed. Since no significant interaction effects were found, only main effects are reported. Hispanic and 12<sup>th</sup> grade participants were used as the reference category.

\* $p < .05$ .

These data indicated that no significant main effects were found between the levels of frequency of athletic participation for tobacco, marijuana, or other drugs. Specifically, the frequency in which students participated in athletic activities did not predict tobacco, marijuana, or other drug use in the current study. In addition to examining the relationship between frequency of athletic participation and substance use, demographic variables (i.e., gender, ethnicity, grade, and SES) were examined. When these variables were examined in the logistic regression analyses, the relationships between gender, ethnicity, and SES and adolescent substance use were not significant. However, the relationship between grade and alcohol use was significant. Logistic regressions analyses indicated that 12<sup>th</sup> graders were significantly more likely to drink alcohol than 10<sup>th</sup> graders in this sample (Log Odds Ratio = 1.325).

The second logistic regression analysis tested differences in substance use by setting of athletic participation. Analyses were conducted for each of the four substance groups (alcohol, tobacco, marijuana, other drugs). For the purpose of these analyses, participants reported in which settings (recreational, school) they participated in athletic activities. Results from the logistic regression analysis are presented in Table 11.

Table 11

*Logistic Regression Analysis: Substance Use and Setting of Athletic Participation (N = 125)*

	<i>Alcohol</i>	<i>Tobacco</i>	<i>Marijuana</i>	<i>Other Drugs</i>
<i>Setting</i> (1=School)	.347	-.996	-.946	-.903
(0=Recreational)	(.417)	(.608)	(.580)	(.579)
<i>Male</i>	.156	-.068	-.462	.197
	(.455)	(.588)	(.628)	(.563)
<i>Ethnicity</i>				
African American	-1.498	.241	-.328	-.499
	(.786)	(.914)	(1.138)	(1.138)
White	-.209	.359	.513	-.041
	(.506)	(.607)	(.582)	(.621)
Other	-1.017	-.479	-1.207	-.495
	(.594)	(.842)	(1.091)	(.837)
<i>SES</i>	.585	-.418	.312	.098
	(.453)	(.537)	(.565)	(.563)
<i>Grade</i>				
9 <sup>th</sup> Grade	-.911	.675	-.703	-.767
	(.531)	(.712)	(.656)	(.712)
10 <sup>th</sup> Grade	-1.450*	.423	-.150	.243
	(.599)	(.801)	(.684)	(.673)
11 <sup>th</sup> Grade	-.372	.632	-1.105	-.519
	(.552)	(.738)	(.759)	(.720)

*Note.* Log odd coefficients are reported and the standard error is reported in parentheses. Interaction terms were created, entered into a model, and analyzed. Since no significant interaction effects were found, only main effects are reported. Hispanic and 12<sup>th</sup> grade participants were used as the reference category.

\* $p < .05$ .

The logistic regression analysis indicated that no significant main effects were present between the settings of athletic participation for alcohol, tobacco, marijuana, and other drugs. In addition to examining the relationship between setting of athletic participation and substance use, demographic variables (i.e., gender, ethnicity, grade, and SES) were examined. When these variables were examined in the logistic regression analyses, the relationship between gender, ethnicity, and SES and substance use were not significant for any of the four substance use groups. However, the relationship was significant between grade and substance use. As previously stated, the overall relationship between setting of athletic participation and substance use in this sample was not statistically significant. However, 12<sup>th</sup> grade students reported significantly more alcohol use in the past year than 10<sup>th</sup> grade students (Log Odds Ratio = 1.450).

## Chapter Five

### Discussion

#### *Summary of the Study*

The purpose of this study was to examine the relationships between participation in athletics and adolescent substance use. Specifically, this study attempted to identify differences in substance use among adolescent athletes and nonathletes. Additionally, the relationships between frequency and setting of athletic participation and substance use were examined. This chapter will summarize the results of the current study and address significant findings. Similarities and differences between findings from the current study and previous research will also be discussed. Finally, this chapter will present the implications of the results for practitioners, identify limitations of the investigation, and discuss directions for future research.

#### *Frequency of Adolescent Substance Use*

*Research Question 1:* What is the frequency of student substance use in this sample with respect to the following drug groups?

- A) Alcohol (wine, beer, and liquor)
- B) Tobacco (cigarettes and cigars)
- C) Marijuana
- D) Other drugs (i.e., inhalants, prescription drugs not prescribed to you, ecstasy, hallucinogens, stimulants, barbiturates, and cocaine).

While over half of the high school participants in this study reported using alcohol in the past 12 months, reported rates of use were much lower for tobacco, marijuana, and the other drugs group. Less than 20% of participants reported using tobacco, marijuana, or other drugs in the past year. Additionally, one substance (heroin) was reported as not being used by any participants and numerous other substances (i.e., chewing tobacco, steroids, methamphetamine, and crack) were reported as being used by only one participant in the past year. Compared to previous research examining adolescent substance use (Johnston et al., 2007), frequency of alcohol use was comparable. For example, Johnston et al. measured self-reported substance use and found that 66.5% of 12<sup>th</sup> graders had used alcohol in the past year compared to almost 70% of 12<sup>th</sup> graders in this study. With regards to frequency of tobacco, marijuana, and other drug use, rates were lower among participants in this sample. Specifically, while Johnston et al. found that over 40% of high school students had reported using tobacco in their lifetime, only about 17% of participants reported using a tobacco product in the past year. Marijuana use also was reported less frequently by participants in this study. While over 25% of 10<sup>th</sup> graders and 30% of 12<sup>th</sup> graders in the Johnston et al. study reported using marijuana in the past year, less than 17% of participants in the current study reported marijuana use. One hypothesis for these differences in substance use may be the predominantly Hispanic population participating in the current study. Previous research has indicated that Hispanic adolescents report lower rates of substance use compared to White adolescents (Johnston et al., 2007). Among the participants in the current study, almost 60% reported their ethnicity as Hispanic compared to only about 20% reporting their ethnicity as White. Based on the previous research that Hispanic adolescents typically report lower

substance use rates, it would be expected that substance use in this sample would be slightly lower due to the large percentage of Hispanic participants.

Regarding gender, Johnston and colleagues found that males reported higher rates of smokeless tobacco, steroid, and illicit drug use as compared to females. In the current study, substance use rates between males and females were not significantly different for any of the four drug groups. However, as Thompson (1987) stated, factors such as sample size and reliability of data can affect statistical significance. It is important to note that due to the small sample size in the current study, significant differences between groups may not have been detected.

Also of interest in this study was the difference in substance use between the high- and low-socioeconomic status (SES) groups. In the current study, 60% of low-SES participants reported using alcohol in the past year compared to less than half of high-SES participants. For the other three drug groups, nearly identical use rates were reported for low- and high-SES participants. Previous research examining the relationship between SES and alcohol use among adolescents has provided different results. For example, when Blum, Beuhring, Shew, Bearinger, Sieving, and Resnick (2000) examined substance use among African-American, White, and Hispanic youth, they found that while high-SES adolescents were less likely to smoke cigarettes, they were more likely to engage in alcohol use than their low-SES peers. Although these results differ from the current study, it is noted that Blum et al. controlled for other factors, including family structure (e.g., single-parent homes), ethnicity, and age of participants when examining SES. Thus, the results of these two studies may not be directly comparable.

## *Athletic Participation and Substance Use*

*Research Question 2:* Are there differences in the frequency and type of drug and/or alcohol use among adolescent athletes and non-athletes?

In the current study, one of the purposes was to examine differences in substance use between athletes and nonathletes. For the purpose of this study, athletes were defined as any participant who reported participating on a school team on the Participation in Athletic Activities Scale. Conversely, nonathletes were defined as any participant who did not report participating on a school team. Of those 139 students who participated in data collection, 47 (33.8%) reported that they participated on a school team. Additionally, 23 (48.9%) students reported participating on one school sports team, while 24 (51.1%) reported participating on multiple school sports teams. At the school where the study was conducted, nine sports teams were offered for males and nine teams were offered for females. During the 2008-2009 school year, the year in which data were collected, 219 males participated on a school athletic team compared to 183 females (R. Harbor, personal communication, September 3, 2009). As mentioned in the previous chapter, no significant differences between athletes and nonathletes were found with regards to any of the four substance groups. Since previous research on substance use in high school athletes has provided equivocal results (Fredricks et al., 2006; Hildebrand, Johnson, & Bogle, 2001; Moore et al., 2005; Naylor et al., 2001), the present researcher was not surprised.

While differences in substance use between athletes and nonathletes were not statistically significant in the current study, there were trends in substance use between athletes and nonathletes consistent with previous research in this area. For example, over

20% of nonathletes reported having used tobacco in the past year, compared to only 8.5% of athletes in the current study. Nonathletes (23.9%) also were more likely to report using marijuana than athletes (10.6%). Additionally, 5% of nonathletes reported having used cocaine in the past year, while none of the athletes in this study reported using cocaine. Similarly, previous research has found that nonathletes reported significantly higher levels of cigarette smoking, cocaine use, and use of psychedelics than athletes (Naylor et al., 2001). Baumert, Henderson, and Thompson (1998) also found that athletes were less likely to smoke cigarettes or marijuana and more likely to engage in healthy dietary behaviors (i.e., eating breakfast on a daily basis, not adding salt to food, consuming fruits and vegetables). With previous research suggesting that athletes engage in healthier behaviors, the researcher hypothesizes that athletes may exhibit lower rates of tobacco and marijuana use due to the perception that smoking will contribute to poor health, and ultimately, negatively affect athletic performance (Melnick, Miller, Sabo, Farrell, & Barnes, 2001). Specifically, athletes could be concerned that smoking cigarettes or marijuana will lead to lower endurance and stamina, along with slowing reaction time. Additionally, it is possible that athletes are concerned that getting caught using marijuana or illicit drugs could result in getting kicked off the sports team. For example, the high school in which the study took place has a substance use policy stipulating that students caught using drugs or alcohol are to be suspended, which could also result in students being dismissed from all school sports teams (R. Harbor, personal communication, September 3, 2009). Also of interest was the lack of steroid use reported by participants. In the current study, only one participant reported using steroids in the past 12 months. While the lack of steroid use was a positive sign, the present researcher thought it would

have been reported by more than one participant. However, due to the low-SES of the participants in this sample, it is less likely that they would be able to afford the cost of expensive drugs such as steroids.

Regarding alcohol use, more athletes (61.7%) in the current study reported having used alcohol in the past year than nonathletes (52.2%). However, previous research on the relationship between athlete status and alcohol use has provided mixed results. For example, while athletes from some studies (Hildebrand et al., 2001; Wetherill & Fromme, 2007) have reported higher rates of alcohol use than nonathletes, Fredricks et al. (2006) found that nonathletes reported significantly higher rates of alcohol use than nonathletes. Although research on the alcohol use behaviors of athletes and nonathletes has provided inconsistent results, both groups (athletes and nonathletes) have reported higher use rates for alcohol than other substances, providing support to previous research suggesting that alcohol use is more socially acceptable than smoking or other drug use (Reifman, Barnes, Dintscheff, Farrell, & Uhteg, 1998). Additionally, Baumert et al. (1998) found that athletes were more likely than nonathletes to engage in alcohol use and binge drinking, as well as more likely to drive more than 10 miles over the speed limit and ride bicycles without helmets. While more research on the relationship between athlete status and alcohol use needs to be conducted, previous research reporting that athletes are more likely to engage in risk taking behaviors suggests that athletes might be more likely to engage in the risky behavior of consuming alcohol.

#### *Gender and Ethnicity and Substance Use*

*Research Question 3: Are there gender and/or ethnicity differences in drug and/or alcohol use among adolescent athletes and nonathletes?*

Another purpose of this study was to examine differences in substance use among participants of different genders and ethnicities. In the current study, some results were consistent with previous research in this area. However, other findings differed from previous studies of high school athletes and substance use. Consistent with previous research (Baumert et al., 1998), when gender, ethnicity, SES, and grade were controlled for, nonathletes reported significantly more marijuana use than athletes. However, when those same four demographic characteristics were controlled for, there were no significant differences in alcohol, tobacco, or other drug use between athletes and nonathletes.

Also of interest in the current study was the relationship between gender and substance use. When athlete status, ethnicity, SES, and grade were controlled for, there were no significant differences in substance use between males and females for any of the four substance groups. However, there were trends in substance use consistent with previous research. For example, more male athletes (71.0%) reported using alcohol in the past year than female athletes (58.0%) in the current study. Since previous research on a large, nationally representative sample has found that male adolescents report higher rates of alcohol use than females (Johnston et al., 2007), these differences in alcohol use were not surprising. With regards to the other three substance groups (tobacco, marijuana, other drugs), male and female athletes reported lower use rates than their nonathlete counterparts in the current study, though not statistically significant. Additionally, use rates among male and female athletes were nearly identical for these three substances, with female athletes reporting slightly higher rates of tobacco use and male athletes reporting slightly higher rates of marijuana and other drug use. While some previous

research on substance use in athletes (Baumert et al., 1998; Naylor et al., 2001) has not found differences between genders, Fredricks et al. (2006) found that gender moderated the relationship between athletic participation and marijuana use. For example, Fredricks and colleagues found that participation in athletics predicted lower marijuana use for males. Additionally, female athletes also reported lower rates of marijuana use than female nonathletes in the current study, though not statistically significant. The results from the current study seem to follow the same trend, with male and female athletes reporting lower rates of marijuana use than nonathletes. As previously stated, the present researcher hypothesizes that athletes may be more inclined to avoid cigarettes, marijuana, and other drugs due to the perception that these substances lead to poor health and negatively affect performance (Melnick et al., 2001). In the current study, although the differences in substance use between male and female athletes and nonathletes were often quite large, it is hypothesized that the small sample size (i.e., only 17 male athletes and 23 male nonathletes) may have resulted in the inability to detect statistical significance (Thompson, 1987).

Regarding participants of different ethnicities, when athlete status, gender, SES, and grade were controlled for, there were no significant differences for any of the four substance groups. Though not statistically significant, there were some large differences between ethnicities for some substances in the current study. For example, a larger percentage of Hispanic athletes (75.0%) reported using alcohol in the past 12 months than African-American athletes (60.0%), White athletes (38.0%), and athletes who identified themselves as Other (33.0%). However, Hispanic athletes reported lower instances of tobacco and marijuana use than both African-American and White athletes. The reported

alcohol use rates for Hispanic athletes was surprising, citing previous research that Hispanic adolescents typically report lower alcohol use than White adolescents (Johnston et al, 2007). Additionally, African-American athletes reported higher marijuana use than White athletes, consistent with previous research which found that participation in athletes predicted lower marijuana use for European Americans, but not for African-Americans (Fredricks et al, 2006). As noted above, while the differences in substance use by ethnicity were not statistically significant in the current study, there were trends in differences between ethnicities consistent with previous research.

#### *Frequency and Setting of Athletic Participation and Substance Use*

*Research Question 4:* Are there relationships between the frequency and setting of athletic participation and adolescent substance use?

The current study intended to add to the empirical literature by examining the relationship between frequency and setting of athletic participation and substance use among high school students. Previous research in this area has examined several relationships between participation in athletics and substance use. For example, Fredricks et al. (2006) examined the connection between the number of clubs/athletic activities participated in and substance use in high school students. Also, participation on specific athletic teams (e.g., football, wrestling, basketball) and substance use in both high school (Moore et al., 2005) and college (Ford, 2007) students has been examined. However, research on the relationship between frequency and setting of athletic participation and substance use in high school students is scarce.

In the current study, no significant differences were found between frequency of athletic participation and substance use for any of the four substance groups. Specifically,

when gender, ethnicity, SES, and grade were controlled for, the frequency in which students participated in athletic activities did not predict alcohol, tobacco, marijuana, or other drug use. While not statistically significant, there were some trends in substance use between the groups. For example, students who participated in an athletic activity once or twice a week were most likely to engage in alcohol use (62%), students who participated less than once a month were most likely to engage in tobacco (25%) and other drug use (38%), and students who reported never participating in athletic activities were most likely to engage in marijuana use (33%). Those students who never participated in athletic activities reported using marijuana nearly twice as frequently as those who participated in an athletic activity three or more times a week, consistent with previous research which found that breadth of participation (defined as participating in numerous prosocial activities, such as school clubs and athletics) predicted lower marijuana use one year after high school (Fredricks et al., 2006). Again, the present researcher hypothesizes that those students who participate in athletic activities more frequently are aware of the perception that smoking marijuana inhibits endurance and athletic functioning (Melnick et al., 2001). Fredricks and colleagues also found that breadth of participation was associated with decreased alcohol use in European Americans and increased alcohol use in African-Americans. Although that seems like a negative trend, the researchers also noted that African-American participants in the study reported lower overall alcohol use rates than European Americans, which is consistent with previous research (Johnston et al., 2007) and the findings from the current study. Also of note, 12<sup>th</sup> grade students in the current study were significantly more likely to report alcohol use than 10<sup>th</sup> grade students,

consistent with findings from previous research that students in higher grades reported increased rates of alcohol use (Dewey, 1999; Johnston et al., 2007).

Similar to the results for frequency of athletic participation, the setting of athletic participation did not predict substance use for any of the four substance groups. However, trends in substance use among those students who participated in school-based athletic activities and those students who participated in recreational athletic activities will be discussed. For example, students who reported participating in athletics in a school setting were more likely to engage in alcohol use (62%) than students who participated in recreational settings (49%). While it seems that participating in a school setting was associated with increased alcohol use, the researcher notes that 66.0% of those students who reported participating in a school setting were in 11<sup>th</sup> or 12<sup>th</sup> grade, compared to only 46.2% of those who reported participating in a recreational setting. Because students in higher grades typically report increased rates of alcohol use (Dewey, 1999; Johnston et al., 2007), and significantly more 12<sup>th</sup> graders reporting alcohol use in the current study, it is important to note that some of the difference in alcohol use between these two groups may be explained by the higher percentage of older students in the school setting group. Conversely, Barber, Eccles, and Stone (2001) found that athletes had more peers who drank alcohol than nonathletes, suggesting that those students participating in school settings may have more alcohol-using peers (and be more likely to use alcohol) than those participating in out-of-school, recreational settings. Regarding the other substance groups, students who reported participating in athletics in a recreational setting were more likely to engage in tobacco (22%), marijuana (22%), and other drug use (21%) than those who reported participating in a school setting. Similar to previous findings in the

current study, the present researcher hypothesizes that those who reported participating in school settings were more likely to be athletes on school-based teams and would be less likely to engage in substance use behaviors (i.e., smoking cigarettes or marijuana, engaging in other illicit drug use) that could negatively impact their performance on the field (Melnick et al. 2001). As noted above, previous research in this area has also examined the relationship between participation in various athletic activities in both the school and out-of-school setting (Moore et al., 2005). Due to the small sample size and low participation rates in certain activities (e.g., hockey, golf, wrestling) in the current study, data related to substance use behaviors among students participating in specific athletic activities could not be analyzed. However, it is important to address the research by Moore and colleagues (2005), as it suggests that substance use is related several factors, including gender, the setting in which students participate, and the sport in which individuals are involved. For example, they found that out-of-school basketball players were significantly more likely to use alcohol than nonbasketball players, tennis players were significantly more likely to use alcohol than nontennis players, and skateboarders were more likely to smoke marijuana than nonskateboarders. Regarding gender, male school-sponsored football players and swimmers were also more likely to smoke marijuana than their nonparticipating counterparts. While results from Moore et al. (2005) do not directly correlate with the results of the current study, they certainly add to evidence from previously stated research suggesting that a variety of factors (e.g., gender, ethnicity, grade, breadth of participation, type of sport/athletic activity involved in) moderate the relationship between athletic activity and substance use among high school

students. The present research suggests that further examinations will help to clarify the relationship between athletic participation and substance use.

### *Implications for Practitioners*

Adolescent substance use has been associated with a number of negative outcomes, including an increased risk for the development of substance use disorders (SUD) later in life (Offord et al., 2000), reductions in educational attainment (Chatterji, 2006a; Chatterji, 2006b; Cox et al., 2007; The Substance Use and Mental Health Services Administration, 2006), and low self-esteem (Dielman, 2006). Although research has confirmed many of these negative outcomes, adolescents continue to report high rates of alcohol and cigarette use, as well as increasing rates of ecstasy, painkiller (i.e., OxyContin, Vicodin), and inhalant use (Johnston et al., 2007).

Since adolescent substance use has been linked to so many negative consequences, it is critical that school psychologists and educators are aware of risk or protective factors that may lead students to use substances, or avoid substance use. With over half (54.2%) of high school students currently participating on school-based athletic teams (National Federation of State High School Associations, 2008), and even more participating in recreational and club settings, examining the relationship between athletic participation and substance use in high school is becoming increasingly important. This study attempted to do that, by examining differences in substance use between athletes and nonathletes, as well as the relationship between frequency and setting of athletic participation and substance use.

The current study found that when gender, ethnicity, SES, and grade were controlled for, nonathletes reported significantly higher rates of marijuana use than

athletes. Additionally, nonathletes were almost two times more likely to report tobacco and other drug use than athletes, though not statistically significant. Regarding alcohol use, athletes reported slightly higher use rates than nonathletes. These findings are consistent with previous research, suggesting a need for educating nonathletes on the negative outcomes associated with tobacco, marijuana, and other drug use. Although research in this area is scarce, it has been suggested that athletes exhibit lower rates of tobacco, marijuana, and other drug use due to an increased knowledge of the negative side effects associated with these substances (Melnick et al., 2001). Perhaps programs designed to educate students on the negative side effects of substance use would lead to decreased tobacco, marijuana, and illicit drug use in high school nonathletes, as well as the overall school population.

A second important finding was that when substance use and ethnicity were examined alone, Hispanic students reported significantly higher rates of alcohol use than students who identified themselves as Other, as well as slightly higher rates than African-American and White participants, though not statistically significant. Conversely, Hispanic students reported lower rates of tobacco and marijuana use than both African-American and White students. With previous research reporting that Hispanic adolescents typically report lower overall substance use rates than African-American and White adolescents, the results from the current study were somewhat surprising for alcohol use. However, the present researcher highlights the need for school psychologists to gather information about the substance use behaviors of the students in their own school, as well as comparing results with nationally representative samples. By relying on previous research, as well as information gathered from students in their specific school, school

psychologists can assist in more accurately targeting groups of students for substance use prevention efforts.

The finding that older students (i.e., students in 12<sup>th</sup> grade) were significantly more likely to report alcohol use than younger students (i.e., students in 10<sup>th</sup> grader) also is informative. Since students in higher grades typically report increased substance use rates (Dewey, 1999; Johnston et al., 2007), these results were anticipated. These outcomes highlight the need for educators, and specifically school psychologists, to provide resources (e.g., information on AA, access to counselors at school or in the community, information on the effects of substance use, etc.) to all students, not only those students who are just entering high school. Unfortunately, only about half of the school districts in one study reported administering a substance use prevention program in their high schools (Ringwalt, Hanley, Vincus, Ennett, Rohrbach, & Bowling, 2008). School psychologists can and should be focused on providing substance use prevention services as early as possible, instead of waiting until students have substance use-related problems to intervene. In order to identify students who are at-risk of engaging in substance use, school psychologists can consult previous research in the area of adolescent substance use, as well as use screening tools such as the Adolescent Domain Screening Inventory (ADSI) (Corrigan, Loneck, & Videka, 2007). Regarding prevention efforts, previous research has highlighted the protective influence that parents and peers can have on students' intentions to use substances. Specifically, Sawyer and Stevenson (2008) found that parent and peer disapproval was associated with lower intentions to use drugs in the future among 6<sup>th</sup> and 8<sup>th</sup> grade students. This research suggests that school psychologists can work together with parents and peers of students who may be at risk

for substance use. Community-based programs focusing on the entire family have also demonstrated positive outcomes, including increases in adolescent self-esteem and assertiveness, as well as increased knowledge of the effects of substance use. In addition to involving parents, peers, and community members, school psychologists can also utilize evidence-based substance use prevention programs, such as *keepin' it REAL* (Kulis, Marsiglia, Elek, Dustman, Wagstaff, & Hecht, 2005). Developed in Arizona, one of the strengths of this substance use prevention program is the emphasis that is placed on cultural values. Specifically, *keepin' it REAL* offers three evidence-based substance use curriculums; one modeled on Mexican-American culture, another modeled on European American and African American cultures, and a multicultural version. The importance of taking cultural values and norms into account cannot be understated when implementing any type of prevention or intervention, especially in diverse schools, such as the high school used in the current study.

### *Limitations*

During the current study, the present researcher and research team took several precautions to address potential limitations and threats to validity. However, not all limitations and threats to validity can be controlled. In this section, the present researcher will address limitations, as well as precautions that were taken to address these limitations.

*Validity of Results.* One goal of any researcher is to enhance the generalizability of study outcomes to the larger population. Due to the design of the current study, several aspects limit the extent to which these results can be generalized to the larger population. First, the current study utilized a convenience sample in which students from a pre-

selected high school were included. Additionally, only students who returned parental consent forms and provided student assent were permitted to participate. The gender characteristics of the students who returned parental consent forms differed from those students who did not receive parental consent. Specifically, an overwhelming majority of students in the convenience sample were female (73.4%), compared to the overall school population of females (52.0%).

The student demographics of the high school population utilized in the current study is also a potential threat to validity. Specifically, the high school used for data collection consisted of predominantly low SES and Hispanic students. The researcher acknowledges that results of this study may not generalize to other populations, such as high SES and predominantly White/Caucasian high school students.

*Sample Size.* The sample size of the current study was 139 students, which represent only about 13% of the overall school population. Previous research by Ji et al. (2004) examined factors which influence return rates of parental consent and found an average return rate of around 57%. Although the researchers took steps to increase participation (i.e., four \$50 Best Buy gift cards, asking teachers to promote participation in the study), the low participation rate makes it difficult to generalize results to the overall school population. Additionally, the small sample size lowered the statistical power of analyses. Specifically, the small sample size lowered the chances that statistically significant results would be found, even when large differences in substance use existed between groups.

*Data Collection Measures.* Another potential limitation to this study is that the survey instruments used to gather information from participants have not been previously

examined regarding their reliability and validity. The Participation in Athletic Activities Scale and Adolescent Substance Use Scale were developed by a team of USF researchers involved in the larger study. The Participation in Athletic Activities Scale was developed in order to determine how often students participated in athletic activities, as well as in which setting students participated in these athletic activities. Due to the present researcher's interest in steroid use in high school athletes, The Adolescent Substance Use Scale was developed in order to include an item measuring steroid use. Although the researchers involved in developing and piloting these instruments took several precautions (i.e., conducting pilot studies, consulting with experienced researchers and USF faculty), further analyses of the instruments used in this study need to be conducted to determine their reliability and validity.

*Data Collection Methods.* A final limitation is that only self-report data were utilized to collect information on athletic participation and substance use in a single school. Although participants were ensured that their responses would be completely anonymous, the possibility exists that students did not fill out the Adolescent Substance Use Scale honestly. Due to the sensitive nature of the questions (illegal substance use), it is possible that participants did not feel comfortable reporting that they had used illegal substances in the past year.

#### *Directions for Future Research*

The current study was an examination of athletic participation and substance use in high school adolescents. This study should be replicated with a larger and more heterogeneous sample to provide a better examination of the relationship between frequency and setting of athletic participation and substance use. In addition to

replicating this study with various populations, future research should incorporate different methods for collecting information. The current study used self-report surveys to collect data, which are quick and efficient methods to collect quantitative data. However, qualitative methods of data collection (e.g., focus groups, interviews) would allow researchers to gather more information on the beliefs, thoughts, and feelings of student athletes regarding to substance use.

Further studies related to this line of research will add to the existing literature in the field of adolescent substance use among high school athletes. Research should examine the relationship between substance use and athletes participating in different sports (e.g., football, baseball, basketball, soccer) and types of sports (i.e., team sports vs. individual sports). Studies examining the variability of substance use both within the teams and between the different sports teams are needed. Continued findings in this area may clarify the relationship between high school athletes and substance use, resulting in more reliable information for school- and community-based practitioners attempting to develop programs aimed at preventing adolescent substance use.

### *Conclusion*

The current study examined a number of relationships between participation in athletic activities and substance use in high school students. Findings support links between athlete status, frequency and setting of athletic participation, grade, and substance use. In addition to informing future research in substance use among athletes, these results may assist school personnel in both developing prevention programs related to substance use and identifying students who are at risk for engaging in substance use.

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## Appendices

## Appendix A: Informed Consent to Parents, English version

Dear Parent or Caregiver:

This letter provides information about a research study that will be conducted at XX Senior High School by investigators from the University of South Florida. Our goal in conducting the study is to determine the effect of students' experiences at school, home, and with friends on their psychological wellness and health.

- ✓ Who We Are: The research team consists of Rance L. Harbor, Ph.D., a Hillsborough County School Psychologist who is also a visitor professor in the College of Education at the University of South Florida (USF), and several graduate students in the USF School Psychology Program. We are planning the study in cooperation with the principal of XX Senior High School (XX) to make sure the study provides information that will be helpful to the school.
- ✓ Why We Are Requesting Your Child's Participation: This study is being conducted as part of a project entitled, "**Risk and Protective Factors Associated with Substance Use Among High School Students.**" Your child is being asked to participate because he or she is a student at XX High School.
- ✓ Why Your Child Should Participate: We need to learn more about what leads to alcohol and drug use while students are in high school. The information that we collect from students may increase our overall knowledge of risk factors that lead to drug and/or alcohol use as well as what characteristics and activities serve as a protective factor. In addition, information from the study will be shared with the teachers and administrators at XX in order to increase their knowledge of specific school experiences that lead to wellness in students. Please note neither you nor your child will be paid for your child's participation in the study. However, all students who participate in the study will be entered into a drawing for one of several gift certificates.
- ✓ What Participation Requires: If your child is given permission to participate in the study, he or she will be asked to complete several paper-and-pencil questionnaires. These questionnaires will ask about your child's thoughts, behaviors, and attitudes towards drug and alcohol use, participation in extracurricular activities, sports, peer relationships, and mental health history. Completion is expected to take your child between 30 and 45 minutes. We will personally administer the questionnaires at XX, during regular school hours in the Winter 2008 semester, to large groups of students who have parent permission to participate. In total, participation will take about one hour of your child's time during one school day.
- ✓ Anonymity of Your Child's Responses: There is minimal risk to your child for participating in this research. We will be present during administration of the questionnaires in order to provide assistance to your child if he or she has any questions

## Appendix A: (Continued)

- ✓ or concerns. In addition, after your child has completed the questionnaires, we will give your child a list of community mental health resources in case he or she would like to discuss personal issues or find out more information about tobacco, alcohol, and drug use. *This study is anonymous.* Your child's name will not be linked in any way to his or her responses. Your child's completed

packet of questionnaires will be added to the stack of packets from other students; we will not be able to identify which student completed which questionnaires. Only we will have access to the locked file cabinet stored at USF that will contain the form your child must sign in order to take part in this study. This permission form will be explained, signed, and collected before questionnaires are handed out in order to avoid linking students' names to their responses. Your child's privacy and research records will be kept confidential to the extent of the law. Authorized research personnel, employees of the Department of Health and Human Services, the USF Institutional Review Board and its staff, and other individuals acting on behalf of USF may inspect the records from this research project, but your child's individual responses will not be shared with school system personnel or anyone other than Dr. Harbor and his research assistants.

- ✓ Please Note: Your decision to allow your child to participate in this research study must be completely voluntary. You are free to allow your child to participate in this research study or to withdraw him or her at any time. Your decision to participate, not to participate, or to withdraw participation at any point during the study will in no way affect your child's student status, his or her grades, or your relationship with XX, Hillsborough County Schools, USF, or any other party.
- ✓ What We'll Do With Your Child's Responses: We plan to use the information from this study to inform educators and psychologists about the effects of various risk and protective factors associated with high school alcohol and/or drug use. The results of this study may be published. However, the data obtained from your child will be combined with data from other people in the publication. The published results will not include your child's name or any other information that would in any way personally identify your child.
- ✓ Questions? If you have any questions about this research study, please contact Dr. Harbor at (813) 872-5300 ext 303. If you have questions about your child's rights as a person who is taking part in a research study, you may contact a member of the Division of Research Compliance of the USF at (813) 974-9343.
- ✓ Want Your Child to Participate? To permit your child to participate in this study, complete the attached consent form and have your child turn it in to his or her homeroom teacher.

Appendix A: (Continued)

Sincerely,

Rance L. Harbor, Ph.D.  
School Psychologist Hillsborough County Public Schools  
Visiting Professor, University of South Florida  
Department of Psychological and Social Foundations

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**Consent for Child to Take Part in this Research Study**

I freely give my permission to let my child take part in this study. I understand that this is research. I have received a copy of this letter and consent form for my records.

\_\_\_\_\_  
Printed name of child

\_\_\_\_\_  
Grade level of child

\_\_\_\_\_  
Signature of parent  
of child taking part in the study

\_\_\_\_\_  
Printed name of parent

\_\_\_\_\_  
Date

**Statement of Person Obtaining Informed Consent**

I certify that participants have been provided with an informed consent form that has been approved by the University of South Florida's Institutional Review Board and that explains the nature, demands, risks, and benefits involved in participating in this study. I further certify that a phone number has been provided in the event of additional questions.

\_\_\_\_\_  
Signature of person  
obtaining consent

\_\_\_\_\_  
Printed name of person  
obtaining consent

\_\_\_\_\_  
Date

## Appendix B: Informed Consent to Parents, Spanish version

Estimados padres:

Esta carta es para informarles sobre un estudio investigativo que será realizado en la Escuela Secundaria de XX. Los investigadores de la Universidad del Sur de la Florida (USF) están tratando de averiguar los efectos que tienen las experiencias en la escuela, la casa y con amistades sobre la salud y el bien psicológico de los alumnos.

Quiénes somos?: El equipo de investigación consiste del doctor Rance L. Harbor, psicólogo para el Condado Escolar de Hillborough y profesor visitante de la Universidad del Sur de la Florida (USF) y también consiste de estudiantes licenciados en el Programa de Psicología en la Universidad del Sur de la Florida (USF). Estamos planeando este estudio investigativo en cooperación con el director de la Escuela Secundaria de XX para poder asegurar que la información obtenida beneficia a la escuela.

Por qué estamos solicitando la participación de su hijo/hija? Este estudio es parte de un proyecto titulado **“Riesgos y factores protectivos asociados con usos de sustancias entre alumnos en escuelas secundarias.”** Su hijo/hija fue seleccionado porque es un alumno/alumna de la Escuela Secundaria de XX.

Por qué su hijo/hija debe de participar? Necesitamos aprender más sobre las razones que atraen a la juventud al uso del alcohol y las drogas cuando están en la escuela secundaria. La información que recibimos de los alumnos puede que nos ayude a entender mejor nuestro conocimiento de los factores peligrosos que atraen a los alumnos al uso del alcohol y las drogas. A propósito, también nos dará la oportunidad de mejor entender nuestro conocimiento sobre las características y las actividades que sirven como factores protectivos en prevenir el uso del alcohol y las drogas. Además, la información que logremos obtener de los alumnos será repartida entre los maestros y la administración de la Escuela Secundaria de XX para que estén al tanto de experiencias específicas que ocurren en la escuela que resultan en la salud y el bien psicológico de los alumnos. Ninguno de los alumnos ni sus padres serán compensado por su participación en este estudio investigativo. Sin embargo, todos los alumnos que participen en este estudio investigativo tendrán la oportunidad de ganar uno de varios premios en una rifa.

Los requisitos para participación: Si su hijo/hija tiene permiso para participar en nuestro estudio se le entregará varios cuestionarios de papel y lápiz los cuáles tendrán que responder. Estos cuestionarios se tratan de los pensamientos, el comportamiento y la actitud de su hijo/ hija sobre el uso del alcohol y las drogas; también tendrán preguntas sobre la participación de su hijo/hija en programas y actividades fuera de la escuela, sobre su participación en deportes, sobre las amistades y relaciones que mantienen con sus compañeros, y sobre la salud y el bien psicológico. Está estimado que le tomará entre media hora y 45 minutos para llenar los cuestionarios. Personalmente distribuiremos los cuestionarios a los alumnos durante las horas de escuela en el segundo semestre escolar (los meses de invierno y primavera). Estos cuestionarios se le darán a los estudiantes que tengan permiso para participar en nuestro estudio; estos alumnos serán divididos en varios grupos. En total, es estimado que la participación de su hijo/hija tomara no más de una hora durante un día de escuela.

La privacidad de las respuestas de su hijo/hija: Hay un riesgo mínimo en la participación de su hijo/hija en este estudio. Nosotros estaremos presentes durante la administración de los

## Appendix B: (Continued)

cuestionarios para poder asistir a su hijo/hija por si acaso tienen algunas preguntas o preocupaciones. En cuanto su hijo/hija termina el cuestionario, nosotros le entregaremos una lista de recursos en la comunidad que ofrecen sus servicios si desean hablar con alguna persona sobre preocupaciones personales o sobre el

mantenimiento de su salud y su bien psicológicamente. También se le ofrecerá información sobre programas sobre el uso del alcohol, las drogas y los productos de tabaco. Este estudio es anónimo. El nombre de su hijo/hijo no aparecerá con las respuestas. Los cuestionarios que termine su hijo/hija se combinarán con los cuestionarios de todos los otros alumnos; nosotros no podríamos distinguir las respuestas y los cuestionarios de un alumno con las respuestas y cuestionarios de los otros alumnos. Nosotros seríamos los únicos con acceso al gabinete con los documentos dándole permiso a su hijo/hija para participar en este estudio y conteniendo la firma de su hijo/hija. El permiso de participación que firman los alumnos se le explicará antes de entregarles los cuestionarios; este documento requiere la firma de su hijo/hija y se recogerá antes de llenar los cuestionarios para asegurar que las respuestas sean anónimas. Los archivos se mantendrán confidenciales al alcance de la ley. Personas autorizadas, empleados del Departamento de Salud y Servicios Humanos, los empleados y los miembros del Panel Institucional de Repaso de la Universidad del Sur de la Florida (USF) y personas actuando por parte de la Universidad del Sur de la Florida pueden revisar los archivos de este estudio, pero las respuestas individuales de cada participante no serán compartidas con empleados del sistema escolar o cualquier otra persona menos el doctor Rance L. Harbor y su grupo de investigadores.

Nota informativa: La decisión permitiendo la participación de su hijo/hija en este estudio investigativo debe ser totalmente voluntario. Usted tiene el derecho de permitir que su hijo/hija participe en este estudio investigativo y también tiene el derecho de retirar la participación de su hijo/hija en este estudio investigativo en cualquier momento deseado. La decisión que usted tome sobre la participación de su hijo/hija en este estudio investigativo no afectará de ninguna manera la posición de su hijo/hija como estudiante, sus notas, o su relación con XX, las escuelas del condado de Hillsborough, la Universidad del Sur de la Florida (USF) o cualquier otra institución.

Lo que haremos con las respuestas de su hijo/hija: Nosotros planeamos utilizar la información obtenida durante este estudio investigativo para mejor informar a los maestros y los psicólogos sobre los efectos de los riesgos y los factores protectivos asociados con usos de sustancias (alcohol y drogas) entre alumnos en escuelas secundarias. Los resultados de este estudio investigativo se podrán publicar. Sin embargo, la información obtenida por parte de su hijo/hija estará combinada con la información obtenida de otros participantes en este estudio investigativo antes de publicación. Los resultados publicados no incluirán ningún tipo de información identificando a su hijo/hija.

Preguntas? Si usted tiene algunas preguntas sobre este estudio investigativo, favor de llamar al doctor Harbor al teléfono (813) 872-5300, extensión 303. Si usted tiene algunas preguntas sobre los derechos de su hijo/hijo como una persona participando en este estudio investigativo, favor de llamar a un miembro de la División de Cumplimiento para Investigaciones en la Universidad del Sur de la Florida al teléfono (813) 974-9343.

Appendix B: (Continued)

Usted desea que su hijo/hija participe en este estudio investigativo? Para permitir que su hijo/hija participe en este estudio investigativo, favor de llamar el formulario proporcionado para que su hijo/hija se lo entregue a su maestro/maestra de homeroom.

Sinceramente,  
Rance L. Harbor, Ph.D.  
Psicólogo para el Condado Escolar de Hillborough  
Profesor Visitante de la Universidad del Sur de la Florida  
Departamento de Fundamentos Psicólogos y Sociales

**Permiso para participar en este estudio investigativo**

Libremente doy mi permiso para que participe mi hijo/hija en este estudio investigativo. Entiendo que esto es una investigación escolar. Yo he recibido una copia de este formulario y documentos para mis expedientes.

\_\_\_\_\_  
Nombre del Estudiante (Escrito con letras Mayúsculas) Nivel Escolar del Estudiante

\_\_\_\_\_  
Firma del Padre Nombre del Padre Fecha  
Alumno Participando En Este Estudio (Escrito con letras Mayúsculas)

**Declaración de la persona obteniendo consentimiento informado**

Yo certifico que los participantes han recibido un formulario de Consentimiento Informado aprobado por el Panel de Repaso Institucional de la Universidad del Sur de la Florida (USF) explicando la historia, las demandas, los riesgos, y los beneficios asociados con la participación en este estudio investigativo. También certifico que un número de teléfono se ha proporcionado por si acaso tendrían algunas preguntas adicionales.

\_\_\_\_\_  
Firma de la Persona Obteniendo Nombre de la Persona Obteniendo Fecha  
Consentimiento Informado Consentimiento Informado  
(Escrito con letras Mayúsculas)

## Appendix C: Student Assent Form

Hello!

Today you will be asked to take part in a research study by filling out several questionnaires. Our goal in conducting the study is to determine the effect of students' experiences at school, home, and with friends on their psychological wellness and health.

- ✓ Who We Are: The research team consists of Rance L. Harbor, Ph.D., the School Psychologist here at XX High School and a professor in the College of Education at the University of South Florida (USF), and several graduate students in the USF School Psychology Program. We are working with your principal to make sure the study provides information that will be helpful to your school.
- ✓ Why We Are Asking You to Take Part in the Study: This study is part of a project called, "**Risk and Protective Factors Associated with Substance Use Among High School Students.**" You are being asked to take part because you are a student at XX High School.
- ✓ Why You Should Take Part in the Study: We need to learn more about what leads to drug and/or alcohol use during high school. The information that we gather may help us better understand what causes psychological wellness during high school and specifically what factors help students not to use alcohol and/or drugs. In addition, information from the study will be shared with the teachers and administrators at XX to help them understand which specific school experiences lead to wellness in students. Please note you will not be paid for taking part in the study. However, all students who participate in the study will be entered into a drawing for one of several gift certificates.
- ✓ Filling Out the Questionnaires: These questionnaires ask you about your thoughts, behaviors, and attitudes towards alcohol and drugs as well as peer relationships, participation in extra-curricular activities, and athletics, and life in general. We expect it will take between 30 and 45 minutes to fill out the questionnaires.
- ✓ Please Note: Your involvement in this study is completely voluntary. By signing this form, you are agreeing to take part in this research. Your decision to participate, not to participate, or to withdraw participation at any point during the study will in no way affect your student status or your grades; you will not be punished in any way. If you choose not to participate, it will not affect your relationship with XX High School, USF, or anyone else.
- ✓ Privacy of Your Responses: We do not expect that there will be more than minimal risk to you for taking part in this research. We will be here to help the entire time you are filling out the surveys in case you have any questions or concerns. When you hand in your completed questionnaires, we will give you a piece of paper that lists places you can call and go to in the community if you would like to discuss personal issues. The paper also tells you how to find out more information about tobacco,

Appendix C: (Continued)

- ✓ alcohol, and drug use. *This study is anonymous.* Your name will not be linked in any way to your responses. Your completed packet of questionnaires will be added to the stack of packets from other

students; we will not be able to tell which student completed which questionnaires. Only we will have access to the locked file cabinet stored at USF that will contain this signed permission form. Your privacy and research records will be kept confidential (private, secret) to the extent of the law. People approved to do research at USF, people who work for the Department of Health and Human Services, the USF Institutional Review Board and its staff, and other individuals acting on behalf of USF may look at the records from this research project, but your individual responses will not be shared with people in the school system or anyone other than us and our research assistants.

- ✓ What We'll Do With Your Responses: We plan to use the information from this study to let others know about the effects of different experiences at school, home, and with friends on students' happiness and risky health behavior. The results of this study may be published. However, your responses will be combined with responses from other people in the publication. The published results will not include your name or any other information that would in any way identify you.
- ✓ Questions? If you have any questions about this research study, please raise your hand now or at any point during the study. Also, you may contact us later at (813) 872-5300 ext 303 (Dr. Harbor). If you have questions about your rights as a person who is taking part in a research study, you may contact a member of the Division of Research Compliance of the USF at (813) 974-9343, or the Florida Department of Health, Review Council for Human Subjects at 1-850-245-4585 or toll free at 1-866-433-2775.

Thank you for taking the time to take part in this study.

Sincerely,

Rance L. Harbor, Ph.D.  
School Psychologist, Hillsborough County Public Schools  
Visiting Professor, University of South Florida  
Department of Psychological and Social Foundations

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Appendix C: (Continued)

**Assent to Take Part in this Research Study**

I freely give my permission to take part in this study. I understand that this is research. I have received a copy of this letter and assent form for my records.

\_\_\_\_\_  
Signature of child taking  
Date  
part in the study

\_\_\_\_\_  
Printed name of child

**Statement of Person Obtaining Informed Consent**

I certify that participants have been provided with an informed consent form that has been approved by the University of South Florida's Institutional Review Board and that explains the nature, demands, risks, and benefits involved in participating in this study. I further certify that a phone number has been provided in the event of additional questions.

\_\_\_\_\_  
Signature of person  
Date  
obtaining consent

\_\_\_\_\_  
Printed name of person  
obtaining consent

Appendix D: Student Demographics Questionnaire

<p><b>1. Gender</b></p> <p><input type="radio"/> 1) Female</p> <p><input type="radio"/> 2) Male</p> <p><b>2. Ethnicity</b></p> <p><input type="radio"/> 1. African American/Black</p> <p><input type="radio"/> 2. Asian/ Pacific Islander</p> <p><input type="radio"/> 3. Hispanic</p> <p><input type="radio"/> 4. Native American/ Alaska Native</p> <p><input type="radio"/> 5. White</p> <p><input type="radio"/> 6. Other (Specify _____)</p> <p><b>3. Age</b></p> <p><input type="radio"/> 13                      <input type="radio"/> 18</p> <p><input type="radio"/> 14                      <input type="radio"/> 19</p> <p><input type="radio"/> 15                      <input type="radio"/> 20</p> <p><input type="radio"/> 16                      <input type="radio"/> 21</p> <p><input type="radio"/> 17                      <input type="radio"/> 22</p> <p><b>4. Grade</b></p> <p><input type="radio"/> 9</p> <p><input type="radio"/> 10</p> <p><input type="radio"/> 11</p> <p><input type="radio"/> 12</p> <p><b>5. Estimated Cumulative GPA</b></p> <p><input type="radio"/> 4.0 or higher (A)</p> <p><input type="radio"/> 3.0-3.9 (B)</p> <p><input type="radio"/> 2.0-2.9 (C)</p> <p><input type="radio"/> 1.0-1.9 (D)</p> <p><input type="radio"/> Less than 1.0 (F)</p> <p><b>6. Do you currently receive Free or Reduced-Price School Lunch?</b></p> <p><input type="radio"/> 1. Yes</p> <p><input type="radio"/> 2. No</p> <p><b>7. Including last year and this year, how many times have you been absent?</b></p> <p><input type="radio"/> 1. Zero to 2 times</p> <p><input type="radio"/> 2. 3 - 9 times</p> <p><input type="radio"/> 3. More than 10 times</p>	<p><b>8. Have you ever received any discipline referrals for behaviors other than being tardy?</b></p> <p><input type="radio"/> 1. Never</p> <p><input type="radio"/> 2. 1 to 5 times</p> <p><input type="radio"/> 3. More than 5 times</p> <p><b>9. Have you ever been suspended out of school (including ATOSS)?</b></p> <p><input type="radio"/> 1. Never</p> <p><input type="radio"/> 2. 1 to 5 days total</p> <p><input type="radio"/> 3. More than 5 days total</p> <p><b>10. Have you ever been arrested?</b></p> <p><input type="radio"/> 1. Never</p> <p><input type="radio"/> 2. 1 to 2 times</p> <p><input type="radio"/> 3. More than 2 times</p> <p><b>11. Have you ever been diagnosed with Attention Deficit Disorder (ADD/ADHD)?</b></p> <p><input type="radio"/> 1. Yes</p> <p><input type="radio"/> 2. No</p> <p><b>12. Have you ever been diagnosed with Anxiety, Depression, or other mental health problems?</b></p> <p><input type="radio"/> 1. Yes</p> <p><input type="radio"/> 2. No</p> <p><b>13. Have you ever been prescribed medication for Attention Deficit Disorder (ADD/ADHD)?</b></p> <p><input type="radio"/> 1. Yes, and I still take the medication.</p> <p><input type="radio"/> 2. Yes, but I no longer take medication.</p> <p><input type="radio"/> 3. No</p> <p><b>14. Have you ever been prescribed medication for Anxiety, Depression, or other mental health problems?</b></p> <p><input type="radio"/> 1. Yes, and I still take the medication.</p> <p><input type="radio"/> 2. Yes, but I no longer take medication.</p> <p><input type="radio"/> 3. No</p>
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Appendix E: Participation in Athletic Activities Scale

In this question you will be asked how often you participate in different physical activities and in what setting(s). For each type of physical activity, circle only one number that describes how often you participate in that type of physical activity and fill in the circle(s) describing which setting(s) you participate in that type of physical activity.

For example, a student who played football once or twice a week on a school team and on a club team would respond like this.

Type of Physical Activity	Circle the number that best describes how often					If yes, in what Setting? (Check all that apply)		
	Never	Less than once a month	Once or twice a month	Once or twice a week	Three or more times a week	Recreational (with Friends)	Club Team(s)	School Team(s)
1. Football	1	2	3	④	5	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

For each type of physical activity, circle the number that best describes how often you participate and fill in the circle for each setting you participate in.

Type of Physical Activity	Circle the number that best describes how often					If yes, in what Setting? (Check all that apply)		
	Never	Less than once a month	Once or twice a month	Once or twice a week	Three or more times a week	Recreational (with Friends)	Club Team(s)	School Team(s)
1. Football	1	2	3	4	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Basketball	1	2	3	4	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Baseball/Softball	1	2	3	4	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Hockey	1	2	3	4	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Soccer	1	2	3	4	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Golf	1	2	3	4	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix E: (continued)

7. Wrestling	1	2	3	4	5		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Tennis	1	2	3	4	5		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Swimming	1	2	3	4	5		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Track and Field (Cross Country, Jogging)	1	2	3	4	5		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Volleyball	1	2	3	4	5		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Cheerleading	1	2	3	4	5		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. X-treme Sports (i.e., Skateboarding, Rollerblading, BMX)	1	2	3	4	5		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Dancing	1	2	3	4	5		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Gymnastics	1	2	3	4	5		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Other: _____	1	2	3	4	5		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix F: Adolescent Substance Use Scale

In the past 12 months, on how many occasions (if any) have you used the following drugs?

Alcohol/Substance Use	Circle the number that best describes on how many occasions						
	Zero occasions	1-2 occasions	3-5 occasions	6-9 occasions	10-19 occasions	20-39 occasions	40 or more occasions
1. Cigarettes/Cigars	1	2	3	4	5	6	7
2. Chewing Tobacco	1	2	3	4	5	6	7
3. Wine/Wine Coolers/Malt Beverages (e.g., Smirnoff Ice)	1	2	3	4	5	6	7
4. Beer	1	2	3	4	5	6	7
5. Liquor (e.g., vodka, rum, whiskey)	1	2	3	4	5	6	7
6. Marijuana	1	2	3	4	5	6	7
7. Inhalants (e.g., glue or gasoline)	1	2	3	4	5	6	7
8. Over the counter drugs when you are <b>NOT</b> sick/hurt (e.g., cough medicine)	1	2	3	4	5	6	7
9. Prescription drugs <b>NOT</b> prescribed to you (e.g., Zanax, Prozac, Ritalin, Adderall )	1	2	3	4	5	6	7
10. Prescription drugs prescribed to you (e.g., Zanax, Prozac)	1	2	3	4	5	6	7
11. Steroids	1	2	3	4	5	6	7
12. Ecstasy	1	2	3	4	5	6	7
13. Hallucinogens (e.g., LSD, Mushrooms)	1	2	3	4	5	6	7
14. Stimulants (uppers)	1	2	3	4	5	6	7
15. Barbiturates (downers)	1	2	3	4	5	6	7
16. Meth	1	2	3	4	5	6	7
17. Cocaine	1	2	3	4	5	6	7
18. Crack	1	2	3	4	5	6	7
19. Heroin (e.g., cheese)	1	2	3	4	5	6	7
20. Other	1	2	3	4	5	6	7