SPORT PARTICIPATION:

IS IT LINKED TO ADOLESCENT SUBSTANCE USE?

by

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A thesis submitted to the Faculty to the University of Delaware in partial fulfillment of the requirement for the degree of Master of Science in Human Development and Family Studies

Spring 2010

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ACKNOWLEDGMENTS

This thesis would not have been possible without the unending support and patience of my colleagues, family, and friends.

I would like to thank Christine Ohannessian, Ph.D. for her continuous guidance, advice, and academic support throughout this program and also for allowing me to use her extensive data from the Adolescent Adjustment Project to conduct my research.

I wish to express my appreciation to my committee members and academic colleagues who have helped to guide me throughout my academic career with constructive feedback and kind words.

I am incredibly grateful to my family and my friends for their support and love. Thank you for always having faith in me. Your humor and encouragement have been truly inspiring.

This manuscript is dedicated to:

My mom, dad, brother, and Jesse for their endless patience, faith, humor, and unconditional love.

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ABSTRACT

This study examined the relationship between participation in sports and substance use over time. Specifically, whether or not the individual participated, particular sports in which the individual participated, and team or individual sport participation were examined along with the adolescent's cigarette, marijuana, and alcohol use. The sample included 1036 participants in the spring of 2007. All participants attended high schools in the Mid-Atlantic region of the United States. Adolescents provided self-report data about their participation in specific sports and their substance use behaviors. ANOVAs and ANCOVAs were run to examine the differences between means for sport participation and cigarette, marijuana, and alcohol use. Boys who participated in sports, specifically football, lacrosse, soccer, and team sports, engaged in higher levels of alcohol consumption. Girls who participated in sports had an older age of first use for alcohol and those who participated in team sports had an older age of first use for marijuana. Implications and future research directions are discussed.

Chapter 1

INTRODUCTION

Adolescent Development

As with other time periods, adolescence is a time of change. This developmental period has multiple components that make it challenging for the individual. Adolescence encompasses puberty, autonomy from parents or guardians, social changes, and self identity formation (Fredricks & Eccles, 2008). Adolescence is a developmental transition that provides opportunities for growth as well as decay (Bohnert, Aikins, & Edidin, 2007). While not all researchers agree on a definition of adolescence, most would concede that high-school-aged youth are experiencing adolescence and that adolescence is a transition into adulthood (Smetana, Campione-Barr, & Metzger, 2006). Most youth will rise above the challenges and demands that adolescence brings, yet others will begin to engage in risk behaviors due to their inability to respond to the stressors inherent to this developmental period.

Adolescence is characterized by a change in where time is spent, and with whom. This marks the time period when individuals begin to spend more time outside of school with their peers than with their parents (Thorlindsson & Bernburg, 2006). Adolescents often have the opportunity to meet many individuals of similar ages in school, participate in extracurricular activities, and neighborhood contexts. These types of exposure allow youth to mix with many different groups and often become part of multiple subcultures

(Thorlindsson & Bernburg, 2006) which give adolescents access to many different friends. However, research has shown that adolescents choose their friends based on similar behaviors and attitudes (Steinburg & Morris, 2001) and that adolescents' choices are influenced by their identity, their peer groups, and the values and norms to which they are exposed (Feldman & Matjasko, 2005). Therefore, time spent with peers can greatly influence the developing adolescent. Spending a majority of time with peers creates a specific adolescent culture which is generally characterized by the potential weakened control of parents and school in addition to a lack of responsibility and a possible increased likelihood for thrill-seeking behavior (Thorlindsson & Bernburg, 2006). While it must be noted that this is not always the case, the possibility of weakened control of parents and schools and increased deviant behaviors may be problematic if adolescents begin disobeying parents and engaging in risky acts.

Adolescence is full of change and adaptation as individuals are becoming one step closer to adulthood. "Adolescent development is influenced by many factors, including family, peers, school, and community" (Borden, Donnermeyer, & Scheer, 2001, p. 12) and is "affected by an interplay of genetic, familial, and nonfamillial influences" (Steinburg & Morris, 2001, p. 89). It is important to recognize these factors and influences when examining adolescents. Adolescence as a developmental period can be challenging as individuals are experiencing biological, psychological, and social changes, such as mood disruptions, parental conflict, and opportunities for risk behaviors (Cicchetti & Rogosch, 2002). Bronfenbrenner's ecological theory, which states that adolescents are actors upon and acted upon by their environment in the forms of different

systems (Bronfenbrenner, 1977), can frame the time period of adolescence. For instance, families, peers, schools, and communities would be considered microsystem influences because these are the systems in which youth are immersed (Brofenbrenner, 1977). Bronfenbrenner's theory and how it relates to this topic will be discussed in detail in the next section. In addition, Albert Bandura's social learning theory can frame adolescent deviancy, suggesting that adolescents who become friends with individuals who are engaging in risky behaviors may be more likely to begin committing these actions themselves. It is in experiencing actions within one's environment that individuals learn such behavior (Bandura, 1969). Bandura's theory will be discussed in detail in a later section.

Bronfenbrenner's Ecological Theory

The proposed research will be framed in Bronfenbrenner's ecological theory. This theory states that human development takes place within a set of nested environments comprised of microsystems, mesosystems, exosystems, macrosystems, and chronosystems (Bronfenbrenner, 1977; Bronfenbrenner 1994). A microsystem encompasses the relationships between the individual and the immediate setting in which the individual lives and acts, and includes social roles, such as familial, student, and peer roles (Bronfenbrenner, 1977; Bronfenbrenner, 1994). A mesosystem is comprised of linkages and relationships between two or more microsystems, such as the relationship between home and school (Bronfenbrenner 1977; Bronfenbrenner, 1994). An exosystem includes the mesosystem and acts as an extension, including events that directly influence microsystems, such as the workplace of parents and mass media (Bronfenbrenner, 1977;

Bronfenbrenner, 1994). A macrosystem is the larger cultural context in which the micro-, meso-, and exosystems are immersed, such as the beliefs or lifestyles of a particular group (Bronfenbrenner, 1977; Bronfenbrenner, 1994). A chronosystem encompasses the characteristics of the person and the environment as well as the changes and consistencies in these over time, such as changes over the life course in socioeconomic status or family structure (Bronfenbrenner, 1994). These systems highlight the notion that every relationship, whether between people or institutions, is extremely important and influential on individuals and relationships.

Therefore, adolescents' contexts are vital to their development (Bronfenbrenner, 1999). Bronfenbrenner (1999) also proposed that process, person, context and time are linked to development. Time encompasses multiple dimensions of temporality, the person includes all of the characteristics specific to a particular individual, the context of an adolescent includes all of the nested levels of environment that the individual develops within, and the process includes the relationship between an individual and their context (Bronfenbrenner, 1999). Therefore, the everyday activities of adolescents are important to their development and also to their adjustment (Vieno, Nation, Perkins, & Santinello, 2007; Bronfenbrenner, 1999). In addition, different contexts provide opportunities for unique developmental experiences (Fredricks & Eccles, 2008). Specific contexts interact with individuals while those individuals are interacting with the contexts that surround them (Bronfenbrenner, 1999). Moreover, biological, emotional, cognitive, and behavioral characteristics of an individual interact with his or her environment and influence development (Bronfenbrenner, 1999). Therefore, multiple aspects of an adolescents'

characteristics and context must be taken into account when trying to predict positive outcomes (Zaff, Moore, Papillo, & Williams, 2003). Both proximal and distal factors affect adolescents' development (Feldman & Matjasko, 2005). Distal factors are definitely important; however, some researchers and scholars indicate that it may be especially important to pay attention to the proximal processes that adolescents are immersed in because these processes may consist of the combined effects of many influences (Bowen, Rose, Powers, & Glennie, 2008; Bronfenbrenner, 1999). Adolescents may not focus on the future but instead may live for the moment, making proximal influences extremely important for this age group. For instance, family plays a significant role in the socialization of children (Vieno et al., 2007). Family is a microsystem for the child, as the family is an immediate setting in which the child exists. This context is influential on the child as he or she grows and continues throughout his or her life. Family structure, whether intact or non-intact, the number of siblings, whether or not they are living in a multigenerational household, etc., all influence the development of an individual (Bronfenbrenner, 1977; Bronfenbrenner 1999).

In regard to forming social networks, adolescents may have access to mass media or social networking websites; however, they are often physically confined to the schools which they attend and the neighborhoods in which they live (Ennett, Bauman, Hussong, Faris, Foshee, & Cai, 2006), which are both microsystems. Adolescents may have the ability to participate in extracurricular activities, namely sports, in either their school or their neighborhood. The ecological contexts that arise out of sport participation lead to the development of unique peer contexts that are important for adolescents (Fredricks &

Eccles, 2008). Thus, if and where sport participation occurs may be important. Sport participation is not isolated from other developmental contexts; it is embedded within schools and communities and participation may be influenced by family and peers (Feldman & Matjasko, 2005). It is impossible to isolate sport participation from the contexts that surround it. The potential interactions between sport involvement and the school or neighborhood context in which this occurs may act as a mesosystem for the adolescent. The environments, or contexts, in which development occurs should not be underestimated, as these contexts can have substantial effects on development and adjustment (Bronfenbrenner, 1999). Also, according to ecological theory (Bronfenbrenner, 1977), bidirectional relationships must be taken into account (Feldman & Matjasko, 2005; Bronfenbrenner, 1999). For instance, the influence of sport participation on substance use and the influence of substance use on sport participation must be examined. Athletic involvement may lead to interactions with risky peers which may lead to substance use or substance use may lead to apathy toward participating in athletics. Specifically, the adolescent and how he or she relates to each of these contexts is important. Although Bronfenbrenner's theory adequately frames this research, there is the need to include other theories, such as Bandura's social learning theory, to obtain different viewpoints on these issues.

Bandura's Social Learning Theory

This research also will be framed in social learning theory (Bandura, 1969) which states that behavior is learned through observing and imitating the actions of others (Bandura, 1969; Gardner et al., 2009). Social learning theory maintains that individuals

identify others who are participating in a specific action and begin participating in this action themselves (Bandura, 1969). This theory is particularly valid when examining substance use among adolescents because adolescents may observe this behavior among their parents or older peers and may begin to model it. Also, viewing substance use behavior through mass media could lead to modeling behaviors (Bandura, 1969) as the influence of mass media is quite large.

Modeling risky behaviors such as using drugs or alcohol has a direct influence on substance use (Vieno et al., 2007). Peer pressure and delinquent peer groups are linked to social learning theory in that adolescents who are engaged in activities with delinquent peers are more likely to be delinquent themselves (Thorlindsson & Bernburg, 2006). Adolescents may see their peers using substances and desire to use them as well. Adolescents who see their parents or older peers using substances may view this as mature adult behavior.

In addition, social learning theory focuses on exposure to alcohol and drug using role models, stating that these are learned behaviors (Ennett, Foshee, Bauman, Hussong, Cai, Reyes, Faris, Hipp, & DuRant, 2008) as observing individuals taking part in these behaviors may act as psychological reinforcers that substance use is a normative behavior. A positive association may be made between friends' substance use and the adolescent taking part in substance use (Ennett et al., 2008). When this positive association is formed, adolescents may become much more likely to begin using substances themselves. Deviancy is a problem among adolescents (Eccles & Barber, 1999; Miller et al., 2007). Thus, social learning theory suggests to researchers that

adolescents who view risk behaviors may be more likely to partake in these behaviors themselves.

Risk Behaviors

Approximately 14 million children regularly spend unsupervised time after school and this unstructured time is often associated with negative behaviors and outcomes (Tebes, Feinn, Vanderploeg, Chinman, Shepard, Brabham, Genovese, & Connell, 2007). Additionally, self-report delinquent behavior research supports other research that finds that most juvenile crime is committed after school dismisses (Fleming, Catalano, Mazza, Brown, Haggerty, & Harachi, 2008; Gardner et al., 2009). This unsupervised time has been shown repeatedly to result in higher levels of deviancy than other times of day. Idle time and inadequate adult supervision of adolescents may easily result in deviant behaviors (Gottfredson, Gerstenblith, Soule, Womer, & Lu, 2004; Eccles & Barber, 1999). The knowledge that unsupervised time can be highly problematic is important when examining risk behaviors during adolescence.

Risk behaviors are common during adolescence. In fact, Miller, Melnick, Barnes, Sabo, and Farrell (2007) found that minor delinquency among adolescents is practically universal. Specific factors must be taken into consideration when researching adolescent deviant behaviors. For instance, as mentioned in regard to social learning theory, deviant friends are a major influence on risk behavior (Bandura, 1969; Thorlindsson & Bernburg, 2006; Borden et al., 2001). Adolescence is a time when individuals crave a sense of belonging among peers, who act as the primary influencers on development (Bohnert et al., 2007; Denault & Poulin, 2009). Therefore, the behaviors of adolescents often

coincide with the behaviors of their closest friends. This may be due in part because adolescence is a time when peers become more important than other influences, such as family or teachers. Along with social learning theory, this point relates to ecological theory and the importance of microsystems to adolescents (Bronfenbrenner, 1977).

Substance use among youth is a serious problem with many consequences. As mentioned previously, unsupervised out-of-school time has been explicitly linked with adolescent substance use (Tebes et al., 2007). This idle time gives adolescents the opportunity to engage in substance use and risk behavior with a low chance of consequences for such behavior. Lower levels of parental monitoring have been linked to deviant behaviors such as substance use among adolescents as well (Freisthler, Byrnes, & Gruenewald, 2009). Additionally, the adolescents' perception of parental monitoring seems to better predict engagement in deviant behaviors, such as substance use, than parents' perception of monitoring (Latendresse, Rose, Viken, Pulkkinen, Kaprio, & Dick, 2009).

Alcohol use is a major problem among adolescents. Alcohol is widely used because it produces pleasurable experiences as it relieves negative affect (Sher, Grekin, & Williams, 2005). Because it is the most frequently used substance among the adolescent population, alcohol use is heavily examined among the adolescent population (Fleming et al., 2008). Alcohol may also be easier to obtain than other substances. Although alcohol use is illegal for high school students, many see it as a rite of passage (Hoffmann, 2006) and believe that this type of behavior shows maturity (Mayeux, Sandstrom, & Cillessen, 2008). Within the adolescent population, there are many differences in the implications

and significance of substance use. “Drinking alcohol at age 10 versus at age 18 suggests very different meanings in terms of what the same behavior signifies” (Cicchetti & Rogosch, 2002, p. 11). Surveys reveal that more than 70% of high school seniors have used alcohol in their lifetime (Hoffmann, 2006) and about 25% have engaged in binge drinking behavior in the past 30 days (Monitoring the Future, 2009) and that boys have higher levels of heavy drinking than girls (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2007). Binge drinking and heavy drinking definitions can be problematic. While many studies have reached a consensus on binge drinking to be four or five alcoholic drinks in one sitting (Fleming et al., 2008), not all agree, and this definition fails to take frequency into account. Consequently, there still may be different interpretations by both researchers and student participants. Underage alcohol consumption and dangerous binge drinking behaviors are clearly major issues among adolescents.

There are multiple reasons that youth begin engaging in alcohol consumption or other substance using behaviors. Mayeux et al. (2008) found that perceived popularity early in high school careers was predictive of increased alcohol use for both boys and girls later in their high school careers. Ennett et al. (2008) stated that attributes of family, peer, school, and neighborhood contexts may predict substance use during the adolescent years. Thus, adolescents’ microsystems may have an influence on substance use, just as the modeling of this behavior among individuals in their microsystems may influence substance use.

Adolescents are at high risk to begin using substances; however, not all adolescents participate in such behavior. In fact, Mayeux et al. (2008) indicated that by

their senior year of high school, almost 60% of students had never smoked a cigarette and 24% had never consumed alcohol. Data from the Monitoring the Future study is consistent with these rates, finding that in 2008 among 12th grade students, about 55% had never used cigarettes and 28% had never consumed alcohol (Johnston, O'Malley, Bachman, & Schulenberg, 2008). The decision of whether or not to begin using substances is influenced by a variety of both personal and contextual factors (Peck, Vida, & Eccles, 2008). Factors such as the value of health, rebelliousness, risk taking, and self-esteem correspond with an individual's likelihood to engage in substance use (Moore & Werch, 2005). Parental supervision is shown to be related to less delinquent behavior and lower levels of substance use (Gottfredson et al., 2004). It has been found that adolescents who have parents who are concerned about underage drinking or drug use are likely to have adopted values similar to their parents' (Shannon, 2006). Although the importance of parents' values may seem to diminish during the adolescent years, the opinions of parents are still significant for many youth (Shannon, 2006). Furthermore, reductions in delinquent behavior are linked to positive peer interactions, healthy social skills, and intentions not to use drugs (Gottfredson et al., 2004). Positive peer interactions may have a different definition for many individuals and could range from having one close friend, to participating in sports, to being recognized as an individual who is very smart.

Despite the importance of parents, a primary influence on whether or not an adolescent will use substances is the peer group. Peer groups and one's self identity contribute to pathways, outcomes, and behaviors during the adolescent years (Eccles &

Barber, 1999; Gardner, Roth, & Brooks-Gunn, 2009). Peers also are highly influential when examining values. Being part of a certain peer group reflects the values of an individual and also influences an individual's attitudes (Moore & Werch, 20005). In regard to substance use, research has shown that there are strong associations between peers' substance use and adolescents' own use (Wichstrom & Wichstrom, 2009; Ennett et al., 2008). Moreover, "substance use is commonly understood as a peer group phenomenon" (Ennett et al., 2006, p. 160). Ennett et al. (2006) state that peer networks have three spheres in relation to substance use: social embeddedness, social status, and proximity to substance users. Social embeddedness explains the importance of having connections with friends during adolescence, social status reflects the importance of how adolescents are viewed by their peers, and proximity to substance users allows linkage between adolescent peer groups and substance use (Ennett et al., 2006). These microsystems are all closely linked to the individual and influence their decisions and behaviors (Bronfenbrenner, 1977).

Finally, when examining deviant acts during adolescence, it is essential to distinguish between experimentation and life-course patterns of risk behavior (Steinburg & Morris, 2001). For instance, if a teenager smokes marijuana several times in their life it may be experimentation, whereas a youth who uses marijuana daily and then begins using cocaine may be involved in a risky pattern of behavior. Consequently, one must differentiate between adolescent-limited problems and life-course-problems (Steinburg & Morris, 2001). Risky behaviors that are limited to the adolescent years may be considered experimentation, whereas behaviors that continue into adulthood could become problems

over an individual's lifespan. Alternatives to engaging in deviant behaviors for adolescents need further research.

Is Sport Participation Linked to Adolescent Substance Use?

Often, it is easy to believe that adolescents' time is consumed with school. However, approximately 80% of a child's time is time not spent in school (Zaff et al., 2003). Additionally, in recent years, parents' work schedules and children's school schedule have had a gap of about 20 hours per week (Gottfredson et al., 2004), creating the need for afterschool extracurricular activities. An example of these afterschool extracurricular activities is sport participation. In the 2004-2005 school year, 42% of U.S. public high school students (4.1 million boys and 2.9 million girls) participated in school-sponsored sports (National Federation of State High School Associations, 2005; U.S. Census Bureau, 2004). Over the years, adolescent participation in extracurricular activities has increased (Borden et al., 2001). Sport participation provides a unique context for adolescents to develop and explore their own identity (Fredricks & Eccles, 2008).

Sport participation may influence adolescents. Adolescents feel leisure time is important because it provides time to relieve stress, relax, and take a break from schoolwork (Shannon, 2006). Leisure time and sport participation allow adolescents to choose and manage their experiences with greater freedom (Darling, 2005) and provide important socialization experiences for many adolescents (Hoffmann, 2006). Thus, the opportunity to participate in sports is of great importance to the adolescent population. Sport participation may be important for adolescent development, the formation of a peer

group, as well as potential participation in risk behaviors. Both substance use and sport involvement may be large factors relating to the adolescent social scene. These two variables are related, as "the types of after-school, leisure, or extracurricular activities in which adolescents participate are related to levels of problem behaviors such as violence, delinquency, and drug use" (Fleming et al., 2008, p. 278). The relationships between certain sports and specific problem behaviors must be studied in depth so that researchers can better understand the connections between sport participation and risk behaviors.

The previous research on this topic includes a wide array of surveys, scales, and studies. They include the Youth Alcohol and Drug Survey (Moore & Werch, 2005), the Delinquency Scale (Miller et al., 2007), the Youth Risk Behavior Survey (Mays & Thompson, 2009; Fleming et al., 2008), the American Drug and Alcohol Survey (Borden et al., 2001), the Michigan Study of Adolescent Life Transitions (Feldman & Matjasko, 2005; Eccles & Barber, 1999), the Raising Healthy Children Project (Fleming et al., 2008), the Adolescent Health Survey (Fleming et al., 2008), the Youth Development Study (Hartmann & Massoglia, 2007), the Project on Human Development in Chicago Neighborhoods (Gardner et al., 2009), the Adolescent Activity Involvement Inventory (Bohnert & Garber, 2007), the Maryland Adolescent Development in Context Study (Fredricks & Eccles, 2008), and the Context of Adolescent Substance Use Study (Ennett et al., 2006).

In general, studies published before the mid-1980s revealed positive relationships between extracurricular activity participation and positive adolescent development; this has been disputed in more recent work (Feldman & Matjasko, 2005) as many findings

have been conflicted (Moore & Werch, 2005). Some studies have found that substance use is lower among students who are involved in sports (Barnes et al., 2007) as sports build character and promote positive development (Moore & Werch, 2005; Hartmann & Massoglia, 2007). Conversely, other studies have found that involvement is either unrelated to or is linked to higher levels of substance use among adolescents (Gottfredson et al., 2004; Gardner et al., 2009; Miller et al., 2007). There is mixed evidence for the idea that sport participation decreases drug use; athletic participation may discourage smoking cigarettes and marijuana (Ford, 2008) because sports promote physical fitness, however, rates of using alcohol (Hoffmann, 2007; Moore & Werch, 2005) and smokeless tobacco (Hartmann & Massoglia, 2007) may increase with sport participation. Additionally, athletics may provide an entry into the adolescent party subculture (Hoffmann, 2007) which results in higher rates of substance use (Ford, 2008) due in part to the widening of social networks (Wichstrom & Wichstrom, 2009). Therefore, whereas some contend that sports promote persistence and teamwork, others feel that sports may not be universally beneficial for participants (Gardner et al., 2009) and that certain subgroups of athletes may be at greater risk for using certain substances in the future (Mays & Thompson, 2009). Discrepancies in the research could be attributed to the use of self-report data, non-representative samples, differences in which sports or substances are being examined, or methodological flaws. In addition to recent research being unclear in regard to the relationships among sport participation, adolescent development, and substance use, other nuances have raised some questions.

Sport participation may have a fading effect on the adolescent. Consistent participation in organized sports has been linked to prosocial behaviors for adolescents and young adults (Zaff et al., 2003; Eccles & Barber, 1999). Darling (2005) also concluded that adolescents were less likely to use substances only in the years in which they were participating in sports. Eccles and Barber (1999) found that, throughout the high school years, extracurricular activities, such as sports, serve as a protective factor against risk behaviors such as drug and alcohol use. This is a prime reason that longitudinal work discussing adolescents, sport participation, and substance use is important.

Proximity accounts for multiple nearby adolescent influences (Bronfenbrenner, 1999). Ennett et al. (2006) found that adolescents who were socially closer to peers who used substances, those who felt less embedded in a social network, and those who had greater social status were more likely to use substances than their counterparts. Ennett et al. (2006) suggests that youth who are both least and most visible in their school networks are most likely to use substances. This finding suggests that both the most popular and the least popular adolescents may participate in higher levels of substance use whereas "middle-of-the-road" adolescents are not at an elevated risk for such a problem. These points relate to adolescents' microsystems and how the adolescents are interacting with them (Bronfenbrenner, 1977). When examining substance use and sport participation, each variable must be taken into account separately before being examined together.

The type of substance use being assessed matters to researchers, human service workers, and policy makers. Alcohol is the primary substance examined in adolescent risk behaviors research. Among students who participate in athletics, research has shown that there in an increase in alcohol use over a two year period (Hoffmann, 2007) and that alcohol consumption may be linked to the degree of athletic involvement and the competition level (Wichstrom & Wichstrom, 2009). Athletic involvement may be associated with higher levels of binge drinking (Hoffmann, 2006) and more incidences of driving while intoxicated (Hartmann & Massoglia, 2007). Moreover, adolescents who play endurance sports have a reduced use of alcohol whereas those involved in team sports have an increased use of alcohol (Wichstrom & Wichstrom, 2009). While alcohol research is important, other substances must be included and analyzed in the research as well. It is essential to examine the relationships between different substances and adolescent sport participation, especially alcohol, cigarettes, and marijuana, the most frequently used substances among the adolescent population.

There is a gap in the research relating to sports. Whereas studies may examine the relationship between sport participation and adolescent substance use, many do not take into account specific sports or substances. Moore and Werch (2005) examined a nationally representative sample of high school students and their participation in sports and found that certain sports were associated with either an increase or decrease in substance use. Consequently, specific sports and their relationships with substance use are of interest to researchers. The gender of participants or non-participants must be differentiated in the research. Finally, whether the sports are team or individualized must

be examined in order to more greatly differentiate the influence of different types of sports during adolescence. There is a great need to add to the existing literature.

Gender. Basic gender distinctions must be made in reference to adolescents and deviant behaviors, such as substance use. In the United States, it has been found that girls are at a lower risk for delinquency than boys (Gardner et al., 2009). It has also been documented that girls have a greater number of prosocial peers than boys and that boys partake in more risk behaviors than girls (Fredricks & Eccles, 2008). Hoffmann (2006) found that girls who participate in extracurricular activities, such as sports, derive a number of benefits such as less alcohol and drug use, but the same is not noted for boys. Moore and Werch (2005) found that boys and girls had no significant differences in their uses of cigarettes, alcohol, and marijuana or in their habits of drinking heavily. This finding indicates that both male and female adolescents may use substances at similar rates. It does not agree with the overall statement that boys have higher rates of substance use, especially the use of alcohol, than girls (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2007; Nolen-Hoeksema & Hilt, 2006; Rodham, Hawton, Evans, & Weatherall, 2005; National Institute on Drug Abuse, 2003). This difference in the findings could be due to methodological differences, sampling issues, or examining the trends with different drugs. There are important gender differences in social consequences surrounding extracurricular activities and substance use (Mayeux et al., 2008).

When examining boys, one study found that boy sport participants were less likely to use cigarettes, cocaine, and inhalants and girl sport participants were less likely to use cigarettes and marijuana than their non-participating peers (Moore & Werch,

2005). However, compared to their non-participating peers, boys who were involved in sports were more likely to use smokeless tobacco, steroids, marijuana, and alcohol (Moore & Werch, 2005). This study indicates that there is a difference between substances that are used by athletes and nonathletes. Male athletes were more likely than male nonathletes to report heavy drinking and drinking and driving in the past month (Mays & Thompson, 2009). For male athletes, athletic participation may be protective initially; however, it appears that over time, male athletes engage in risky behaviors such as consuming alcohol (Feldman & Matjasko, 2005). In fact, "male athletic participation is often accompanied by a greater propensity to socialize and attend parties where alcohol may be available" (Hoffmann, 2007, p. 286).

When examining girls, the same study found that there was no association between cigarette use, marijuana use, alcohol use, or heavy drinking and school-sponsored softball, basketball, soccer, swimming, volleyball, and track, and outside-of-school baseball, softball, basketball, jogging, horseback riding, tennis, swimming, or soccer (Moore & Werch, 2005). Additionally, "female out-of-school dancers/cheerleaders/gymnasts" were more likely to use alcohol than female nonparticipants (Moore & Werch, 2005, p. 489). This study indicates that there is a difference between sports that girls take part in and whether or not they use substances. In addition, female athletes were much less likely than female nonathletes to report ever drinking or drinking in the past month (Mays & Thompson, 2009). Thus, gender is essential to examine in regard to sport participation and adolescent substance use. In

addition, the specific sport must be noted and whether the sport is team or individual may be important in its implications for substance use.

Individual sports and team sports. A differentiation between types of sports must be made in order to determine whether or not there are differential influences. Sports that are played as a team, such as football or soccer, may have different developmental implications than individual sports, such as swimming or tennis. One study found that adolescents who were skateboarders, surfers, or tennis players, all individualized non-contact sports, were more likely to use alcohol than adolescents who did not participate in these sports (Moore & Werch, 2005). Additionally, male swimmers who were school-sponsored and tennis players who were nonschool-sponsored, both individual sports, were more likely to engage in using alcohol than those who did not participate in these activities (Moore & Werch, 2005). A different study found that athletes who are involved in a team sport are more likely to use substances than athletes who play a nonteam sport (Ford, 2008). This type of research must be replicated in order to discern the differential relations that type of sport may have with substance use during adolescence.

Other factors. The pre-existing factors surrounding adolescents must be taken into account when examining the implications of participating in sports. Already existing personal factors may influence why certain people become involved in particular activities (Peck et al., 2008) and these same factors may account for participation in certain sports or substance use in general. Selective participation occurs when youth who are well adjusted participate only in particular activities whereas youth who are not well

adjusted participate only in other activities or do not participate at all (Darling, 2005). Researchers have noted that with cross-sectional data it is difficult to separate preexisting differences of adolescents who do or do not participate in sports (Fredricks & Eccles, 2008). This is one reason why longitudinal data is important.

In regard to substance use, there is a difference between social groups and types of substance used. Participants who belong to different social groups experiment with various types of substances (Feldman & Matjasko, 2005). Older peers may be influential by providing adolescents with alcohol or drugs. Lastly, mediators, moderators, and confounding variables must be taken into account when examining adolescents, sport participation, and substance use. Adolescents have a large amount of discretionary time; what is done with this time varies from person to person (Shannon, 2006), based on individual characteristics and context.

Conclusion. Although researchers know a great deal about development during adolescence, there still is the need for more information and understanding. Specific differences in experiences, gender, race, socioeconomic status, family hierarchy, and various other factors may greatly influence an adolescent's development. Most adolescents cope successfully with the demands of this developmental period; however, some have difficulty (Cicchetti & Rogosch, 2002). Having knowledge of the biological, cognitive, and social changes that occur during normative adolescent development can contribute to the comprehension of problems that occur during this time period (Cicchetti & Rogosch, 2002).

Sport participation is undoubtedly important, especially in the lives of adolescents. Adolescence is often the time when risk behaviors, such as substance use, begin. The relationship between sport participation and antisocial behavior is multifaceted and multidirectional (Fleming et al., 2008). Adolescent development must be examined from the microsystems in which the individual exists. For instance, sport participation in adolescence is necessary to examine as the adolescent exists within this context and may create peer groups from this participation. The different aspects of this relationship are necessary to research in order to uncover the complex dynamics between sport involvement and substance use.

Sport participation among adolescents and its implications are important for several reasons. Approximately 80% of a child's time is not spent in school (Zaff et al., 2003) and approximately 42% of public school students report participating in school-sponsored sports (National Federation of State High School Associations, 2005; U.S. Census Bureau, 2004). Thus, a large number of adolescents participate in sports every year. Sport participation provides a socialization experience for adolescents (Hoffmann, 2006). More importantly, participation in sports may create a microsystem for the individual (Bronfenbrenner, 1977; Bronfenbrenner, 1994) which may greatly influence the individual's thoughts, behaviors, morals, and values. Although there is a fair amount of research focusing on sport participation and adolescent adjustment, previous findings regarding the relationship between sports involvement and substance use have been conflicted (Moore & Werch, 2005). Some studies have found that sport participation provides an alternative to deviant behaviors (Thorlindsson & Bernburg, 2006) and results

in less illicit drug use (Barnes et al., 2007). Others (Gardner et al., 2009; Miller et al., 2007) have found no evidence that organized sports participation deters delinquency and suggest that playing sports may give participants more opportunities to take part in unstructured social settings where delinquency and substance use often occurs. These mixed findings call for more research on this topic. Thus, the first research question examines whether or not sport participation has an impact of substance use among boys and girls.

Sports are not created equal nor are they similar in nature. The context of different sport must be examined (Bronfenbrenner, 1999). Further, not all sports have the same relationship with adolescent adjustment, including substance use (Moore & Werch, 2005). This is because different contexts provide diverse opportunities for developmental experiences (Fredricks & Eccles, 2008). Therefore, participation in specific sports provides diverse opportunities for the individuals who take part. In previous research, Wichstrom and Wichstrom (2009) examined Norwegian adolescents by dividing sports into several categories and found differential tobacco, alcohol, and marijuana use patterns based on the specific sport examined, underscoring the importance of distinct substance use categories and of examining participation in specific sports. Specific sports give the individual access to certain peer groups and according to social learning theory, the individual will learn from the peer group that surrounds him or her (Bandura, 1969). The peer group that an individual creates while participating in a sport may be very influential in the life of the individual. Certain subgroups of athletes may be at a greater risk for engaging in specific types of substance use (Mays & Thompson, 2009). According to

previous research, being involved in sports is generally correlated with a lower use of cigarettes, marijuana, most prescription drugs (Ford, 2008) and cocaine (Hoffman, 2007); however, participation in specific sports is commonly linked to an increased use of alcohol (surfing, tennis), binge drinking (swimming), marijuana (skateboarding, swimming) and possibly an increased level of experimentation with cigarettes (wrestling) and potentially other substances (Moore & Werch, 2005). These discrepant findings demonstrate the need to research specific sports and their relationships to specific substances. However, it must be noted that these findings may be more related to the culture created by participation in specific sports rather than the specific sport itself. These concerns about participation in specific sports will be addressed in the second research question which investigates substance use among individuals who play particular sports.

Differentiating between team and individual sports may be difficult, but this is an important area of study for several reasons. Substance use varies by sport participation, involvement, and competition level; therefore, multiple factors must be examined when researching the relationship between sport participation and substance use (Wichstrom & Wichstrom, 2009). Individual and team sport participation must be differentiated and addressed. The setting in which an individual participates in a sport creates a microsystem for the individual (Bronfenbrenner, 1977; Bronfenbrenner, 1994). This principle of Bronfenbrenner's bioecological theory emphasizes that there will be differences in the microsystem created by an individual sport and the microsystem created by a team sport. For example, the context created by an individual sport may be

more competitive or stressful as the individual is competing primarily against him or herself whereas a team sport context may be based more on camaraderie or socialization as players are working together to win. These distinctions between individual and team sport contexts may influence differences in substance use habits as the nature of participation in one classification of sport is so different from the nature of participation in the other.

In addition to the microsystem that is created, the peer group that is experienced while participating in sports may be very important to the development of the individual, as proposed by social learning theory (Bandura, 1969). Social learning theory states that individuals learn from those who surround them (Bandura, 1969). The peer group that is created when playing an individual sport as compared to playing a team sport could be quite different. Again, individual sports may create a greater competitiveness among players as each individual wants to do better than the rest, whereas team sports may have a bonding effect as players are working toward a common goal. Martha, Grelot, and Peretti-Watel (2009) examined French students who participated in individual sports and team sports and found that participation in team sports increased the risk for heavy episodic drinking among males whereas participation in individual sports were protective against heavy drinking behaviors for females. This study will expand on Martha et al.'s (2009) research by examining high school students from the United States.

Although an exhaustive list of individual and team sports was not provided in the studies cited, tennis, swimming, golf, and gymnastics were considered individual sports whereas handball and basketball were included as team sports (Martha et al., 2009;

McHale, Vinden, Bush, Richer, Shaw, & Smith, 2005). Therefore, in the proposed study, individual sports will be operationalized to include any sport in which an individual is primarily competing against his or her best time, score, etc. Some of the sports that have been classified as 'individual' in the previously cited studies (Martha et al., 2009; McHale et al., 2005) and in the proposed study actually involve a team, such as bowling, cross country, golf, gymnastics, swimming, tennis, track and field, and wrestling. However, participants are competing with their best scores and times; therefore, scoring points for the team is secondary. The classification system proposed for this research follows the precedents that were set in previous research studies. Team and individual sports are innately different, and the third research question regarding these categories of sports and their implications for substance use will add a great deal to the small amount of literature on this topic.

This study aims to further examine and analyze the relationship between sport participation and substance use during adolescence. There is a need to study the particular sports in which adolescents participate in order to better understand the substance use that occurs within the contexts of specific sports. Additionally, the effects of specific sports on the use of specific substances will be examined. This research study will attempt to discern the relationships between specific sports and cigarette, marijuana, and alcohol use. Gender will be taken into account. Finally, the study that is being proposed will provide an extensive understanding of the relationship between sport participation and substance use to the adolescent development and risk behavior literature.

This study investigates the following research questions: (1) Is participation in sports related to substance use age of onset and/or alcohol use for boys and girls? (2) Is participation in specific sports associated with substance use age of onset and/or alcohol use for boys and girls? and (3) Are individual and team sport participation differentially related to the onset of substance use/alcohol use during adolescence for boys and girls?

Chapter 2

METHOD

Participants

All of the participants were involved in a larger research project and attended a public high school in the Mid-Atlantic region of the United States (Ohannessian, 2009). The data for this research project was first collected in the spring of 2006. The present study is based on data collected during the springs of 2007 and 2008.

During the spring of 2007, the sample included 1036 participants (see Table 1), from the 10^{th} (56%) and 11^{th} (43%) grades. The age of the students ranged from 14 to 19 years old, with a mean of 16.15 (SD=0.751). The majority of adolescents (58%) were identified as Caucasian, 23% were African American, 12% were Hispanic, and 2% were Asian (the remaining adolescents chose 'other' to describe their race/ethnicity) (see Table 2). Most of the adolescents lived with their biological mother (89%), 61% lived with their biological father, 4% with a stepmother, 15% with a stepfather, 2% with an adoptive mother, 2% with an adoptive father, 5% with a grandmother, and 3% with a grandfather (6% classified their living situation as "other"). Of the participants, 41.6% lived with both biological parents in 2007. A small minority of the adolescents (2%) reported being adopted. The vast majority of the adolescents' parents had completed high school (96% of mothers and 96% of fathers). In addition, some of the adolescents' parents had

completed four years of college (26% of mothers and 24% of fathers) and a minority had attended graduate or medical school (11% of mothers and 8% of fathers).

Measures

Sport participation. The adolescents were asked to report how they spent their time outside of school within the past year. They were asked about their participation in sports and were provided a line to write in which sports they had participated. The response scale ranged from 1 = no involvement to 6 = every day involvement (see Figure 5). This section of the survey remained the same across both times of measurement.

When discussing participation in specific sports, only those sports that had at least 20 individuals who reported being participants ($n \geq 20$) were assessed. Twenty was chosen as a defining number because it is a large enough number of participants to show significance if a significant interaction is occurring between variables. The sports with at least 20 reported participants were: baseball, basketball, cheerleading, field hockey, football, lacrosse, soccer, softball, swimming, tennis, track and field, and volleyball.

The sports were also recoded into categorical variables of individual and team sports. All of the sports reported by participants were recoded to be either an individual or a team sport. Individual sports were considered to be any sport in which an individual is primarily competing against his or her best time, score, etc. Therefore, some of the sports that are classified as 'individual' are actually played on as a team, such as bowling, cross country, golf, gymnastics, swimming, tennis, track and field, and wrestling. Although these sports may be played on as a team, participants are above all competing with their best scores and times and scoring points for the team comes second to that.

Team sports were considered to be sports in which groups of players were directly competing against other groups of players, such as baseball, basketball, football, lacrosse, soccer, and volleyball. Consequently, the sports have been coded as either individual or team according to such thought processes. Individual sports were coded as 01 and are listed as follows: BMX, bowling, boxing, cross country, cycling/bike riding, dancing/dance, diving, equestrian/horseback riding, figure skating, fishing, golf, gymnastics, Jiu Jitsu, weight lifting, martial arts, motorcross, running, skateboarding, surfing, swimming, Tae Kwon Do, tennis, track and field, walking, wrestling, and yoga. Team sports were coded as 02 and are listed as follows: baseball, basketball, cheerleading/cheer, field hockey, football, hockey, ice hockey, lacrosse, rugby, soccer, softball, ultimate Frisbee, and, volleyball. Individual and team sports were examined separately.

Onset of substance use. The adolescents were asked to report their age of first use for different substances. The participants were provided a line to write in the age at which they first tried the substance or a line to check off "never' if they had never tried the substance. The substances included: cigarettes, smokeless tobacco, marijuana or hashish, amphetamines, someone else's Adderall or Ritalin, crack cocaine, other forms of cocaine, barbiturates or sedatives, hallucinogens, Ecstasy, opiates, inhalants, steroids, and alcohol (see Figure 6). There also was a question about a fake substance, antacins, which was added to the survey as a validity check. The surveys that included positive responses about using antacins were discarded. During the spring of 2007, the survey did not ask

about age at first use of alcohol whereas during the spring of 2008, the survey included a question about the age at first use of alcohol without parents present.

Individuals who did not report using a particular substance at the time of the survey, were coded as "missing." This allowed for analyses to be conducted examining only individuals who had used the substance. By exploring only individuals who had begun to use substances, the difference between the mean ages of onset between those who did and did not participate in sport activities could be illustrated. This study examined cigarettes, marijuana, and alcohol onset as these substances had the highest number of individuals who had began using.

Alcohol use. The adolescents were asked to report their alcohol use during the past six months. The participants were asked if they had consumed any alcoholic beverages during the past six months. If they had, they were asked how often they usually had beer/wine/liquor, when they had beer/wine/liquor on the average day how much they usually drank, how many times they had six or more servings of beer/wine/liquor, all within the past six months. They were also asked how much liquor an average mixed drink contained and how many times they consumed five or more alcoholic drinks in the past six months (see Figure 7).

Using the data gathered from this survey, three variables were created. The alcohol consumption variable expresses the sum of the beer, wine, and liquor consumption items in the alcohol use survey. The quantity x frequency of alcohol consumption variable is the sum of the beer quantity x beer consumption frequency, wine quantity x wine consumption frequency, and liquor quantity x liquor consumption

frequency items in the alcohol use survey. Finally, the binge drinking variable denotes the sum of beer, wine, and liquor binge drinking items in the alcohol use survey. This study considered binge drinking to be consuming six or more drinks in one sitting and did not take frequency into account. All three of the alcohol variables were skewed originally and were linearly transformed for this analysis.

Validity Concerns. When discussing this study, the validity and limitations of using adolescent self-report substance use data must be mentioned. There are multiple studies which have focused on this issue. Overall, these studies observe a high rate of agreement in regards to substance use when looking at validity checks. Willis and Cleary (1997) and Dolcini, Adler, Lee, and Bauman (2003) focused only on cigarette use among adolescents which was validated by expired breath samples from the adolescents. The validity of self-reports was highest among Caucasian adolescents followed by African Americans and Hispanics (Willis & Cleary, 1997); overall it was found that the validity of self-report cigarette use was high (Dolcini et al., 2003). A particular study looked at substances in greater depth. Flisher, Evans, Muller, and Lombard (2004) surveyed over 700 adolescents at their starting point and then re-surveyed the same adolescents 10 to 14 days later and found that there was a 92.7% observed agreement when examining the use of cigarettes, 89.7% observed agreement when examining the use of alcohol, and 93.7% observed agreement when examining the use of marijuana.

Another study also observed the validity of self-report data by surveying individuals over time. Shillington and Clapp (2000) used a large national survey of adolescents and found that the agreement between reports of alcohol use, cigarette use,

and marijuana use were high, with over 80% of users being consistent in their reports. Williams and Nowatzki (2005) focused on a population of adolescents who were referred for substance use assessment and found that while the majority of adolescent self-reports were corroborated by their urine samples, 28% of self-reports were not corroborated. It was also found that underreporting of substance use was more likely for drugs such as cocaine and opiates compared to drugs like marijuana (Williams & Nowatzki, 2005). Although these studies employed different methods for validating adolescent substance use self-reports, all seem to have found high rates of agreement. Therefore, the findings in this study should have high levels of validity as well.

Procedure

The data for this study are taken from an ongoing longitudinal study being conducted by Christine Ohannessian, Ph.D. through the University of Delaware, the Adolescent Adjustment Project. The Adolescent Adjustment Project (AAP) is funded by a grant from the National Institute of Health and uses self-report data from adolescents who are enrolled in public high schools in Delaware, Pennsylvania, and Maryland. During the springs of 2007 and 2008, the students were administered a survey during their time at school.

In the springs of 2007 and 2008, students for whom parental consent was obtained and who provided their own assent (Figures 1 through 4), were administered self-report surveys at school by trained research staff (all were certified with human subjects training). During the spring of 2007, there was an overall participation rate of 70.6%. Upon giving assent, the adolescents were reassured that their participation was voluntary,

their answers were confidential, and that they could withdraw their participation at any time. To further protect the privacy of the adolescents, an active Certificate of Confidentiality from the U.S. Government was in place for this project. The survey took approximately 40 minutes to complete and was administered during a class period at the adolescents' school. Upon completion, the students received a free movie pass for their participation.

Chapter 3

RESULTS

Analysis

Sport participation and nonparticipation were the independent variables in all of the analyses. The dependent variables were the substance use variables (age of onset for cigarettes, marijuana, and alcohol). Participants who had never tried the substances were coded as "missing" and were excluded from the analysis.

ANOVAs were run to examine those who played sports and those who did not play sports (binary: yes or no) and their difference in means for age of onset for substance use; those who played specific sports and those who did not play specific sports (categorical: baseball, basketball, cheerleading, field hockey, football, lacrosse, soccer, softball, swimming, tennis, track, and volleyball) and their difference in means for age of onset for substance use; those who played individual sports and those who did not play individual sports (binary: yes or no) and their difference in means for age of onset for substance use; and those who played team sports and those who did not play team sports (binary: yes or no) and their difference in means for age of onset for substance use. The substance use variables were linearly transformed using a logarithm to account for skewness. The results can be seen in the tables in Appendix A.

ANCOVAs were run to examine the differences between means for sport participation variables (independent variables) and alcohol use variables (dependent

variables). In these ANCOVAs, age was included as a covariate because age is associated with drinking behaviors; that is, the older an individual is the more likely he or she is to consume alcohol. The ANCOVAs examined those who played sports and those who did not play sports (binary: yes or no) and their difference in means for the alcohol use variables; participation or nonparticipation in specific sports (categorical: baseball, basketball, cheerleading, field hockey, football, lacrosse, soccer, softball, swimming, tennis, track, and volleyball) and their difference in means for the alcohol use variables; individual sport participation or nonparticipation (binary: yes or no) and their difference in means for the alcohol use variables; and team sport participation or nonparticipation (binary: yes or no) and their difference in means for the alcohol use variables The alcohol use variables were linearly transformed using a logarithm to account for skewness. The results can be seen in the tables in Appendix A.

Table 1 expresses the participants' gender in 2007 and 2008. A slight majority of the participants were girls in 2007, a greater majority in 2008. Table 2 provides the ethnic/racial breakdown of participants in 2007 and 2008. The majority of participants were Caucasian, followed by African American. Table 3 provides an overall number and a gender breakdown for the frequency of participation in specific sports in 2007. Again, only sports with 20 or more participants overall were included in this study. Table 4 provides the number, percentage, and average age of individuals who had used cigarettes, marijuana, and alcohol in 2008.

Sport Participation versus Nonparticipation

The first research question examined the relationship between participation in sports and substance use during adolescence for boys and girls. A one-way ANOVA was conducted to examine the relationship between participation or nonparticipation in sports and the onset of cigarette, marijuana, and alcohol use (see Table 5). Only individuals who had used a particular substance were included in order to examine the difference between ages of onset. The relationship between participation in sports and substance use during adolescence for boys and girls was also examined in regards to alcohol consumption, quantity x frequency of alcohol consumption, and binge drinking (see Table 6). These variables were examined by conducting an ANCOVA that included age as a covariate. These analyses also were conducted by gender.

Boys. There were no significant findings regarding boys who did or did not participate in sports and the onset of substance use. However, boys who did participate in sports had a significantly higher mean for alcohol consumption ($F(2,262)=5.256$; $p<.01$) and a significantly higher mean for quantity x frequency of alcohol consumption ($F(2,264)=6.402$; $p<.01$) than boys who did not participate in sports. These results can be seen in Table 6. Binge drinking was not found to be significantly related to sport participation or nonparticipation for boys.

Girls. The ANOVA revealed that girls' participation or nonparticipation in sports was related to the age of onset for alcohol use. Girls who participated in sports had a significantly higher mean for the age of first use of alcohol ($F(1,191)=4.793$); $p<.05$).

The differences in means can be seen in Table 5. As shown in Table 6, the alcohol consumption and binge drinking variables were not significant for girls.

Specific Sport Participation versus Nonparticipation

The second research question examined whether or not participation in specific sports (baseball (see Tables 7 and 8), basketball (see Tables 9 and 10), cheerleading (see Tables 11 and 12), field hockey (see Tables 13 and 14), football (see Tables 15 and 16), lacrosse (see Tables 17 and 18), soccer (see Tables 19 and 20), softball (see Tables 21 and 22), swimming (see Tables 23 and 24), tennis (see Tables 25 and 26), track (see Tables 27 and 28), and volleyball (see Tables 29 and 30)) was associated with the age of onset for cigarette, marijuana, and alcohol use. The aforementioned sports were included because they had at least 20 participants overall ($\underline{n}>20$). When examining individuals, participants were grouped into two categories, those who did play the specific sport and those who did not play the specific sport. Therefore, individuals who did not play the specific sport may have been participants in other sports, just not the sport of current examination. The frequencies of participation and the gender breakdown can be seen in Table 3. A one-way ANOVA was conducted to examine whether or not participation in these specific sports was related to the onset of substance use. Mean differences in age of onset can be seen in Tables 7-29, odd-numbered tables only.

The relationship between participation in specific sports and substance use during adolescence was also examined in regard to alcohol consumption, quantity x frequency of alcohol consumption, and binge drinking. These variables were examined by conducting an ANCOVA which included age as a covariate. These analyses also were conducted by

gender. Again, when examining these individuals, participants were grouped into two categories, those who did play the specific sport and those who did not play the specific sports. Therefore, individuals who did not play the specific sport may have been participants in other sports, just not the sport of current examination. This may act as a limitation in the current study. The difference in means can be seen in Tables 8-30, even-numbered tables only.

Boys. There were no significant findings regarding boys who did or did not participate in specific sports and the onset of cigarette, marijuana, and alcohol use. However, the ANCOVAs revealed that boys who participated in football had a higher mean for quantity x frequency of alcohol consumption than boys who did not participate in football ($F(2,268)=3.657$; $p<.05$) (see Table 16). In addition, as shown in Table 18, boys who participated in lacrosse had a higher mean for alcohol consumption and a higher mean for quantity x frequency of alcohol consumption than boys who did not participate in lacrosse ($F(2,264)=8.953$; $p<.001$) and ($F(2,268)=9.746$; $p<.001$), respectively. Similarly, boys who participated in soccer had a higher mean for binge drinking than boys who did not participate in soccer ($F(2,209)=3.096$; $p<.05$) (see Table 20).

Girls. There were no significant findings regarding girls who did or did not participate in specific sports and the onset of cigarette, marijuana, and alcohol use. There were also no significant differences for girls who participated or did not participate in specific sports for alcohol consumption and binge drinking. These results can be seen in Tables 9-30.

Individual and Team Sport Participation versus Nonparticipation

The third research question examined whether or not individual and team sport participation were differentially related to onset of cigarette, marijuana, and alcohol use during adolescence for boys and girls. The analyses were conducted by gender. One-way ANOVAs were conducted to examine the relationship between participation in individual sports (see Table 31) and team sports (see Table 33) and the onset of substance use. The relationship between participation and nonparticipation in individual sports (see Table 32) and team sports (see Table 34) during adolescence for boys and girls also was examined in regard to alcohol consumption, quantity x frequency of alcohol consumption, and binge drinking. These variables were examined by conducting an ANCOVA that included age as a covariate.

Boys. There were no significant findings regarding onset of cigarette, marijuana, and alcohol use among boys who did or did not participate in individual sports. These results can be seen in Tables 31 and 32. In contrast, boys who participated in team sports had a higher mean for alcohol consumption and quantity x frequency of alcohol consumption than boys who did not participate in team sports ($F(2,266)=5.324$; $p<.01$) an d ($F(2,268)=6.495$; $p<.01$), respectively. These results can be seen in Table 34.

Girls. Girls who participated in team sports had a higher mean age of onset for marijuana use than girls who did not participate in team sports ($F(1,118)=4.421$; $p<.05$). The difference in means can be seen in Table 33. There were no significant findings for girls who participated or did not participate in individual or team sports and the alcohol use variables. These results can be seen in Tables 32 and 34.

Chapter 4

DISCUSSION

The Present Study

The aim of the current study was to examine the relationship between sport participation and adolescent substance use. Specifically, whether or not the individual participated, the particular sports in which the individual participated, and team or individual sport participation were examined along with the adolescent's self-reported cigarette, marijuana, and alcohol use. This study is important to the literature because sport participation and its relationship to substance use is a growing area of interest that has previously reached little consensus. As will be discussed later in this section, this may be because there are other important variables that are affecting the relationship between sport participation and substance use. In addition, this study examined points which others may not, including substance use among those who participate in specific sports, the relationship between substance use and team and individual sports, and gender differences.

There are sampling issues surrounding substance use that must be addressed. The current study found that 20% of the adolescents had ever tried smoking a cigarette and 30% had ever tried drinking alcohol whereas Mayeux et al. (2008) and the Monitoring the Future study found that 40-45% had tried smoking a cigarette and 72-76% had tried

drinking alcohol (Johnston et al., 2008). Mayeux et al. (2008) examined a population of about 400 students all from one high school in a Northeastern city whereas the Monitoring the Future Study examined the substance use patterns of approximately 50,000 youth nationally. The participants in the current study may be from a geographic region or from specific schools that have lower rates of cigarette and alcohol use than other geographic areas and than the national average. The Mid-Atlantic may be a region that does not condone the use of cigarettes and alcohol in the same way as other geographic areas. Therefore, the population at hand may be different than the populations sampled by Mayeux et al. (2008) and the Monitoring the Future study (Johnston et al., 2008).

Sport participation versus nonparticipation. The research questions presented in this study yielded some very interesting findings. Boys who participated in sports reported consuming higher quantities of alcohol and had a higher quantity x frequency of alcohol consumption than boys who did not participate in sports. Therefore, boys who played sports appeared to engage in higher rates of drinking behaviors, but not necessarily illicit substance related behaviors. Also, boys' participation in sports was associated with consuming larger quantities of alcohol and imbibing more frequently, perhaps because the microsystem in which they were immersed engaged in these behaviors. This finding agrees with Hoffman's (2007) point that increased rates of alcohol use may occur when individuals take part in sports, particularly because sport participation may provide the individual with access to a party subculture. In terms of social learning theory (Bandura, 1969), sport participation may lead individuals to make

many friends, some of whom may be older than the individual and may have more access to alcohol.

It must be noted that while alcohol consumption and the quantity and frequency at which one consumes alcohol were significantly linked to sport participation, binge drinking was not found to have a significant connection to sport participation. This may be linked to problematic definitions for binge drinking behavior. Binge drinking is commonly accepted to be four or five drinks at one sitting (Fleming et al., 2008), while the definition in this study was six or more drinks at one time and the frequency of such consumption was not taken into account. Regardless of definition, for high school students who may have just started to engage in drinking behaviors, the amount of alcohol that it takes them to become dangerously intoxicated could be much less than five or six drinks in one sitting.

While boys who participated in sports were found to have higher levels of alcohol consumption than boys who did not participate, girls who participated in sports were found to begin using alcohol at an older age than girls who did not participate in sports, illustrating a gender difference in alcohol use. Perhaps girls who participated in particular sports were surrounded by a microsystem or context that did not encourage drinking or partying behaviors. Generally, girls have a greater number of prosocial peers than boys (Fredricks & Eccles, 2008) which may lead to a less risky microsystem or lower levels of engagement with deviant peers. This explanation supports social learning theory (Bandura, 1969) in that if the girls are not in peer groups with individuals who are using alcohol, they will not begin to use alcohol either. Overall, participation in any type of

sport seemed to differentially influence boys and girls who participated or did not participate. Fredricks and Eccles (2008) assert that sport participation creates unique peer contexts. These unique peer contexts will influence the individual and have an impact on his or her behavior (Bandura, 1969). This could be the case in regard to the differences between girls and boys and their sport participation.

Specific sport participation versus nonparticipation. The second piece of this study examined specific sports and the implications for substance use linked to either participating or not participating. Boys who participated in football had a higher quantity x frequency of alcohol consumption. Furthermore, boys who played lacrosse had a higher overall alcohol consumption and a higher quantity x frequency of alcohol consumption than boys who did not play lacrosse. Lastly, boys who participated in soccer had a higher rate of binge drinking than boys who did not participate in soccer. The higher levels of alcohol consumption among football and lacrosse players may be related to the nature of these sports. Football and boys' lacrosse are sports that may be characterized by aggression and high levels of contact within the interactions of the players. In both football and lacrosse, participants are expected to either initiate physical contact with or respond to physical contact from other players. Adolescents who participated in these sports may have specific characteristics that would lead them to engage in more risky drinking behaviors than individuals who did not participate in these types of sports. The characteristics of a person (biological, cognitive, emotional, and behavioral) influence the development of that person (Bronfenbrenner, 1999). Therefore, the characteristics of these players rather than the sports themselves may be influencing levels of substance use

(Bronfenbrenner, 1999). Further, boys that played football and lacrosse were exposed to a masculine environment which could have led to their adoption of substance using behaviors. According to Bronfenbrenner (1977; 1999) and Bandura (1969), the context, or peer group, that surrounds individuals can greatly influence them. These findings relate to alcohol use only. Adolescence is the peak time in which alcohol use begins and alcohol is the most widely used substance among adolescents (Fleming et al., 2008).

There were no significant findings for girls concerning participation or nonparticipation in certain sports and substance use. This is interesting because Moore and Werch (2005) found that girls who participated in cheerleading were more likely to use alcohol than girls who did not participate in cheerleading. Moore and Werch (2005) studied a large group of 8^{th} graders in Florida, so differences in the samples may be the reason why dissimilar findings were observed. The finding from the current study does not suggest that girls who participate in certain sports are not using substances. Rather, this finding may indicate that both girls who participated and did not participate were beginning to use substances at the same age and that they used alcohol at similar rates.

Individual and team sport participation versus nonparticipation. Individual and team sport participation were also of interest as they were shown to have differences in their substance use implications. Individual sport participation or nonparticipation was not significantly related to substance use among boys or girls. Team sport participation, however, was found to have certain implications. Boys who participated in team sports had a higher overall alcohol consumption and a higher quantity x frequency of alcohol consumption than boys who did not participate in team sports. This corresponds with the

earlier findings that boys who participated in sports consumed more alcohol and boys who played football and lacrosse, both team sports, had higher alcohol consumption. Alcohol use is viewed as a rite of passage for many adolescents (Hoffmann, 2006). In addition, those who participate in team sports have an increased use of alcohol perhaps due to the widening of social networks (Wichstrom & Wichstrom, 2009). Boys who participated in team sports may have been surrounded by teammates who used alcohol and, in accordance with social learning theory, these individuals may have encouraged others to begin using alcohol. The widening of social networks could also be linked to the increased availability of alcohol. The contexts in which an individual is immersed influences development; therefore, participation in a team sport could be quite important (Bronfenbrenner, 1999). There were also significant findings for girls.

Girls who participated in team sports had an older age of onset for the use of marijuana than girls who did not participate in team sports. Girls who participated in team sports may have been spending their time with a peer group that did not encourage marijuana use. The characteristics of the girls who participated in team sports may not be congruent with characteristics that would be associated with marijuana use. This finding may be interpreted in relation to social learning theory (Bandura, 1969) and ecological theory (Bronfenbrenner, 1977) as the peer group and microsystems that surround the girls are primary influences on their substance use behaviors. Also, this finding concurs with Hoffmann (2007), Ford (2008), and Darling (2005) who stated that individuals who participate in athletics may be less likely to use marijuana because sports promote physical fitness and aerobic ability.

In regard to individual and team sport participation, potential moderators, mediators, and underlying factors should be mentioned. The differences found between individual sports, team sports, and their relationships to substance use may have been caused by factors other than the individual or team nature of any given sport. For example, an adolescent who is participating in an individual sport (as defined by this study) may form bonds with others who participate in the same sport and their peers' views about substance use (either using or abstaining) may have more to do with the adolescent's decision to either use or abstain more so than the nature of the sport. Therefore, substance using behaviors may be more related to a microsystem or context of the individual, separate from their sport participation or nonparticipation. Moderators, mediators, and underlying factors could also include contextual issues ranging from the socioeconomic status of the individuals to the parenting style of their guardians to the historical time at which this study occurred to the birth rank of the individual (Bronfenbrenner, 1999). This is worth mentioning because from these findings it cannot be inferred that the individual or team nature of a specific sport is linked to substance use. There is a need for more thorough research on this topic.

Conclusion. There were differential findings relating to substance use in this study. With the exception of girls who participated in team sports using marijuana at older ages, the rest of the significant findings were related to alcohol consumption, and none were related to cigarette use. This could be because alcohol is the most widely used drug by the adolescent population (Fleming et al., 2008). Therefore, there were more individuals who had used alcohol than any of the other substances.

Overall, the findings from this study demonstrated that sport participation may affect boys and girls differently. Boys who participated in sports were associated with higher levels of alcohol consumption. This is problematic because alcohol use rates are high among adolescents (Fleming et al., 2008). Girls may obtain benefits when participating in sports. Girls who participated in sports had an older age of first use for alcohol and girls who participated in team sports had an older age of first use for marijuana. For girls, sport participation may provide an alternative to deviant behavior such as substance use (Thorlindsson & Bernburg, 2006).

Gardner et al. (2009) maintains that sports may not be universally beneficial. This research study seems to have sampled a group of individuals who do not collectively benefit from their participation, as boys who participated engaged in higher levels of alcohol use whereas girls who participated used alcohol and marijuana at older ages. Therefore, it seems that the microsystems of boys and girls may be different. Bronfenbrenner (1999) states that contexts can shape the development of the individual. The contexts that individuals develop within include the gender and race of the individual, socioeconomic status of the family, the overall family system, community or neighborhood, school setting, peer group, timing of biological and social transitions of the individual, and multiple other components, all embedded within the historical time in which the individual is living (Bronfenbrenner, 1999). Specifically regarding this study, influential contexts could include the underlying nature of the sport being examined. For instance, football players are involved in a sport in which they are taught to both give and receive full body hits from other players. This context is dramatically different than the

context of a sport like gymnastics where participants are taught to move gracefully and to manage their muscle tone. These contexts can greatly influence development and adjustment (Bronfenbrenner, 1999), and must be considered when discussing the present study.

This study has potential implications for prevention of substance use, specifically alcohol consumption, among adolescents. As previously mentioned, girls who participated in sports began using alcohol and drugs at older ages than girls who did not participate in sports. Boys who participated in sports, namely team sports, had higher levels of alcohol consumption than boys who did not participate in sports. Encouraging girls to participate in sports could help with the prevention of substance use. Additionally, for boys who participate in sports, coaches should act also as mentors, encouraging prosocial behavior. The encouragement of prosocial behavior, particularly abstaining from substance use, from an authority figure could have an impact on individuals who were considering using substances. When stating these implications, it must be noted that this study did not take bidirectionality into account. This study examines the association between sport participation and substance use, but cannot infer whether sport participation in influencing substance use, substance use is influencing sport participation, or there are a host of contextual factors which are affecting results. While this study acts as a stepping stone in the literature regarding sport and substance use, there is a need for studies that can differentiate the direction of influence and can acknowledge any underlying contextual factors that are influencing substance use among adolescents.

Future Directions

In the future, it would be beneficial to examine a sample of individuals who participate in a more extensive array of sports to gain insight into what the participation in other sports may mean for the individuals who play. Also, focusing on the number of sports played and the frequency of participation would be beneficial as both of these factors may be related to the risk of using substances. Differentiating between ethnicities of participants could lead to a greater understanding of which adolescents are using substances. By examining this demographic variable, researchers may gain insight about substance problems among adolescents by clarifying which specific groups of adolescents are more likely to use which specific types of substances. More substances could also be examined. A larger sample may allow researchers to examine the use of rarely studied illicit drug use and sport participation among adolescents.

As previously mentioned, contextual factors should be researched. There is a multitude of factors that could be related to adolescents' substance using behaviors that may or may not deal with sport participation. Individuals cannot be separated from these contexts (Bronfenbrenner, 1999), so it is essential that research includes these contextual points (socioeconomic status, parenting style, timing of biological and social transitions, etc.) and examines them along with sport participation and substance use. Contexts must be taken into account (Bronfenbrenner, 1999). More research in this area would add greatly to what is known about the linkages between sport participation and substance use during adolescence.

Limitations

A limitation of this study is that the sample is from the Mid-Atlantic region of the United States so the results may not be generalizable to all populations and geographic regions. This study did not take into account whether the sports played by individuals were school sponsored or non-school sponsored, which may make a difference with the associated outcomes. For instance, non-school sponsored sports which are played in a community setting could lead to the development of a much different peer group than participation in school sponsored sports. Only cigarette, marijuana, and alcohol use were examined in this study because other illicit substances were only used by a small number of individuals (e.g. steroids) and therefore were excluded from the analysis. Obtaining a larger sample size in which larger numbers of individuals had used each substance could aid in exhibiting the true differences in average ages for first use among different drugs. Another limitation was that there was no validation of the answers regarding substance use over time. As mentioned previously, there may be slight validity issues with adolescent self-reports of substance use behaviors. Therefore, another form of validation may be important to examine the amounts of substances that are used by the individuals who are completing the survey, for example a urinalysis or a breathalyzer test. Lastly, there was participant mortality in this study which acts as a limitation. Participants who stop engaging in a research study may be innately different than participants who continue to engage. Therefore, mortality in the present study could act as a limitation as specific participants are no longer available for data collection on their substance use behaviors.

Despite these limitations, this study builds on the existing literature in a number of ways. First, this study added to the conflicted literature on this topic, attempting to clarify the associations between the phenomena at hand. This study focused on participation in several specific sports which seem to have the highest levels of participation at the high school level. This helps to inform researchers and educators as to which particular sports or types of sports may have participants that are prone to risk behaviors. In addition, this study examined participation in team and individual sports, allowing for differentiation between these two categories. In sum, this study offers a great deal to the current literature on this topic.

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APPENDIX A

Table 1

Participant's Gender in 2007 and 2008

	Survey year			
	2007		2008	
Gender	*n*	%	*n*	%
Boys	492	47.4	396	42.6
Girls	544	52.4	495	57.1
Total	1036	99.8	867	99.7

Table 2

Participant's Ethnicity/Race in 2007 and 2008

	Survey year			
	2007		2008	
Ethnicity/Race	*n*	%	*n*	%
Caucasian	585	56.4	488	56.3
African American	228	22.0	190	21.9
Hispanic	117	11.3	102	11.8
Asian	24	2.3	22	2.5
Other	56	6.7	58	6.7
Total	1038	98.7	867	99.2

Table 3

Participation in Specific Sports in 2007

	Total		Boys		Girls	
Sport	*n*	%	*n*	%	*n*	%
Baseball	40	3.9	37	7.7	3	0.6
Basketball	57	5.6	34	7.1	23	4.3
Cheerleading	27	2.6	1	0.2	26	4.8
Field Hockey	31	3.0	0	0.0	31	5.7
Football	74	7.2	74	15.4	0	0.0
Soccer	70	6.8	31	6.4	39	7.2
Softball	42	4.1	0	0.0	42	7.8
Swimming	28	2.7	14	2.9	14	2.6
Tennis	40	3.9	14	2.9	26	4.8
Track	62	6.1	35	7.3	27	5.0
Volleyball	37	3.6	3	0.6	34	6.3

Table 4

Average Age of First Substance Use

	Boys			Girls		
Substance	*n*	%	$\bar{x}$	*n*	%	$\bar{x}$
Cigarettes	89	18.5	13.30	113	20.9	13.27
Marijuana	102	21.2	14.35	120	22.2	14.81
Alcohol	133	27.6	14.42	196	36.3	14.77

Table 5

Participation in Sports and Substance Use

	Boys				Girls			
	No Participation		Participation		No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	27	13.37(2.339)	61	13.26(2.301)	53	13.08(2.344)	58	13.45(1.884)
Marijuana	23	14.26(2.734)	77	14.38(1.631)	56	14.54(1.788)	62	15.05(1.408)
Alcohol	28	14.46(2.186)	103	14.41(1.828)	79	14.52(1.789)	114	14.94(1.185)*

*p<.05.

Table 6

Participation in Sports and Alcohol Use

	Boys		Girls	
Alcohol Use	No Participation *n*= 69,70,60 $\bar{x}$(SD)	Participation *n*=194,195,146 $\bar{x}$(SD)	No Participation *n*=150,150,135 $\bar{x}$(SD)	Participation *n*=205,208,176 $\bar{x}$(SD)
Alcohol Quantity	-1.1561(1.8797)	-0.5161(2.0773)**	-1.1788(1.7598)	-0.9008(1.9323)
Quantity x Frequency	-1.0040(2.20967)	-0.1897(2.5248)**	-0.9930(2.1003)	-0.6213(2.2395)
Binge Drinking	-1.8243(1.28286)	-1.3881(1.7198)	-1.5827(1.6029)	-1.3817(1.8047)

**$p < .01$.

Table 7

Participation in Baseball and Substance Use

	Boys			
	No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	84	13.20(2.275)	5	14.80(2.168)
Marijuana	95	14.29(1.940)	7	14.57(2.299)
Alcohol	120	14.42(1.881)	13	14.46(2.025)

Table 8

Participation in Baseball and Alcohol Use

	Boys	
Alcohol Use	No Participation *n*= 246 $\bar{x}$(SD)	Participation *n*=21,21,20 $\bar{x}$(SD)
Alcohol Quantity	-0.7422(2.0229)	-0.3108(2.2146)
Quantity x Frequency	-0.4782(2.4386)	0.0999(2.7077)
Binge Drinking	-1.6084(1.5324)	-0.7863(2.0578)

Table 9

Participation in Basketball and Substance Use

	Boys				Girls			
	No Participation		Participation		No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	88	13.31(2.296)	1	12.00	105	13.26(2.121)	8	13.88(2.232)
Marijuana	100	14.35(1.956)	2	12.50(0.707)	111	14.79(1.624)	9	15.00(1.414)
Alcohol	130	14.42(1.871)	3	14.67(3.055)	182	14.78(1.470)	14	14.79(1.477)

Table 10

Participation in Basketball and Alcohol Use

	Boys		Girls	
Alcohol Use	No Participation *n*= 255,257,202 $\bar{x}$(SD)	Participation *n*=12,12,8 $\bar{x}$(SD)	No Participation *n*=343,346,300 $\bar{x}$(SD)	Participation *n*=16,16,14 $\bar{x}$(SD)
Alcohol Quantity	-0.6974(2.0396)	-0.9401(2.0660)	-1.0403(1.8560)	-0.5851(2.0645)
Quantity x Frequency	-0.4240(2.4595)	-0.6260(2.5739)	-0.8027(2.2309)	-0.2336(2.5129)
Binge Drinking	-1.5224(1.6046)	-1.7257(1.6317)	-1.4766(1.7194)	-1.4824(1.6517)

Table 11

Participation in Cheerleading and Substance Use

	Girls			
	No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	109	13.29(2.153)	4	13.50(1.291)
Marijuana	116	14.79(1.613)	4	15.25(1.500)
Alcohol	187	14.76(1.474)	9	15.22(1.302)

Table 12

Participation in Cheerleading and Alcohol Use

	Girls	
Alcohol Use	No Participation *n*= 341,344,298 $\bar{x}$(SD)	Participation *n*=18,18,16 $\bar{x}$(SD)
Alcohol Quantity	-0.9733(1.8846)	-1.9055(1.1567)
Quantity x Frequency	-0.7147(2.2740)	-1.9786(0.9510)
Binge Drinking	-1.4477(1.7362)	-2.0207(1.1277)

Table 13

Participation in Field Hockey and Substance Use

	Girls			
	No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	107	13.26(2.156)	6	14.00(1.414)
Marijuana	111	14.76(1.619)	9	15.44(1.333)
Alcohol	175	14.75(1.503)	21	15.05(1.117)

Table 14

Participate in Field Hockey and Alcohol Use

	Girls	
Alcohol Use	No Participation *n*=337,338,298 $\bar{x}$(SD)	Participation *n*=22,24,16 $\bar{x}$(SD)
Alcohol Quantity	-1.0535(1.8506)	-0.5070(2.0510)
Quantity x Frequency	-0.8359(2.2188)	0.0444(2.4699)
Binge Drinking	-1.5009(1.6979)	-1.0292(1.9960)

Table 15

Participation in Football and Substance Use

	Boys			
	No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	77	13.34(2.216)	12	13.00(2.796)
Marijuana	83	14.30(1.936)	19	14.37(2.087)
Alcohol	113	14.38(1.839)	20	14.65(2.183)

Table 16

Participation in Football and Alcohol Use

	Boys	
Alcohol Use	No Participation *n*=234,236,186 $\bar{x}$(SD)	Participation *n*=33,33,24 $\bar{x}$(SD)
Alcohol Quantity	-0.7810(1.9939)	-0.1926(1.2908)
Quantity x Frequency	-0.5272(2.3961)	0.2401(2.8269)*
Binge Drinking	-1.5888(1.5287)	-1.0753(2.0699)

*p<.05.

Table 17

Participation in Lacrosse and Substance Use

	Boys				Girls			
	No Participation		Participation		No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	84	13.26(2.324)	5	13.80(1.643)	110	13.30(2.136)	3	13.33(2.082)
Marijuana	95	14.31(1.957)	7	14.43(2.070)	118	14.84(1.601)	2	13.00(0.000)
Alcohol	125	14.42(1.898)	8	14.38(1.847)	193	14.81(1.461)	3	13.00(0.000)

Table 18

Participation in Lacrosse and Alcohol Use

	Boys		Girls	
Alcohol Use	No Participation *n*= 259,261,206 $\bar{x}$(SD)	Participation *n*=8,8,4 $\bar{x}$(SD)	No Participation *n*=352,355,309 $\bar{x}$(SD)	Participation *n*=7,7,5 $\bar{x}$(SD)
Alcohol Quantity	-0.7865(2.0161)	1.8259(0.6113)***	-1.0070(1.8686)	-1.6748(1.6610)
Quantity x Frequency	-0.5276(2.4296)	2.6528(1.1129)***	-0.7637(2.2453)	-1.4781(2.1814)
Binge Drinking	-1.5428(1.5778)	-0.8758(2.8536)	-1.4635(1.7245)	-2.3026(0.0000)

***p<.001.

Table 19

Participation in Soccer and Substance Use

	Boys				Girls			
	No Participation		Participation		No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	82	13.32(2.266)	7	13.00(2.708)	107	13.28(2.149)	6	13.67(1.751)
Marijuana	97	14.29(1.995)	5	14.80(0.837)	112	14.79(1.635)	8	15.13(1.126)
Alcohol	121	14.43(1.927)	12	14.33(1.497)	183	14.80(1.485)	13	14.54(1.198)

Table 20

Participation in Soccer and Alcohol Use

	Boys		Girls	
Alcohol Use	No Participation *n*= 243,245,191 $\bar{x}$(SD)	Participation *n*=24,24,19 $\bar{x}$(SD)	No Participation *n*=334,337,291 $\bar{x}$(SD)	Participation *n*=25,25,23 $\bar{x}$(SD)
Alcohol Quantity	-0.6900(2.0503)	-0.8931(1.9350)	-1.0409(1.8432)	-0.7410(2.1573)
Quantity x Frequency	-0.4054(2.4803)	-0.7156(2.2730)	-0.8048(2.2157)	-0.4096(2.6105)
Binge Drinking	-1.4533(1.6607)	-2.3026(0.0000)*	-1.5148(1.6951)	-0.9969(1.9118)

*p<.05.

Table 21

Participation in Softball and Substance Use

	Girls			
	No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	107	13.29(2.110)	6	13.50(2.588)
Marijuana	110	14.77(1.635)	10	15.20(1.229)
Alcohol	177	14.75(1.471)	19	15.05(1.433)

Table 22

Participation in Softball and Alcohol Use

	Girls	
Alcohol Use	No Participation *n*=331,333,290 $\bar{x}$(SD)	Participation *n*=28,29,24 $\bar{x}$(SD)
Alcohol Quantity	-1.0402(1.8559)	-0.7810(1.9885)
Quantity x Frequency	-0.8165(2.2209)	-0.3301(2.4850)
Binge Drinking	-1.5036(1.6795)	-1.1547(2.1004)

Table 23

Participation in Swimming and Substance Use

	Boys				Girls			
	No Participation		Participation		No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	88	13.26(2.282)	1	16.00	112	13.30(2.134)	1	13.00
Marijuana	99	14.30(1.982)	3	14.67(0.577)	115	14.78(1.632)	5	15.40(0.548)
Alcohol	129	14.43(1.907)	4	14.00(1.155)	188	14.80(1.484)	8	14.25(0.886)

Table 24

Participation in Swimming and Alcohol Use

	Boys		Girls	
Alcohol Use	No Participation *n*= 257,259,203 $\bar{x}$(SD)	Participation *n*=10,10,7 $\bar{x}$(SD)	No Participation *n*=349,351,305 $\bar{x}$(SD)	Participation *n*=10,11,9 $\bar{x}$(SD)
Alcohol Quantity	-0.7175(2.0284)	-0.4710(2.3667)	-1.0492(1.8540)	0.0005(2.0605)
Quantity x Frequency	-0.4464(2.4484)	-0.0864(2.8682)	-0.8200(2.2268)	0.5781(2.4558)
Binge Drinking	-1.5251(1.6041)	-1.6748(1.6610)	-1.5115(1.6776)	-0.3036(2.5272)

Table 25

Participation in Tennis and Substance Use

	Boys				Girls			
	No Participation		Participation		No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	88	13.31(2.296)	1	12.00	111	13.32(2.133)	2	12.00(1.414)
Marijuana	100	14.34(1.960)	2	13.00(1.414)	119	14.79(1.599)	1	17.00
Alcohol	130	14.44(1.888)	3	13.67(2.082)	188	14.77(1.476)	8	15.00(1.309)

Table 26

Participation in Tennis and Alcohol Use

	Boys		Girls	
Alcohol Use	No Participation *n*= 259,261,203 $\bar{x}$(SD)	Participation *n*=8,8,7 $\bar{x}$(SD)	No Participation *n*=335,338,290 $\bar{x}$(SD)	Participation *n*=24 $\bar{x}$(SD)
Alcohol Quantity	-0.6931(2.0393)	-1.2000(2.0478)	-0.9618(1.8858)	-1.8326(1.3253)
Quantity x Frequency	-0.4132(2.4662)	-1.0796(2.3028)	-0.7095(2.2671)	-1.7355(1.6289)
Binge Drinking	-1.5389(1.5962)	-1.2749(1.8867)	-1.4399(1.7369)	-1.9240(1.3568)

Table 27

Participation in Track and Substance Use

	Boys				Girls			
	No Participation		Participation		No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	82	13.44(2.288)	7	11.57(1.512)	108	13.29(2.114)	5	13.60(2.608)
Marijuana	92	14.40(1.956)	10	13.50(1.841)	117	14.80(1.620)	3	15.00(1.000)
Alcohol	117	14.51(1.827)	16	13.75(2.236)	186	14.74(1.478)	10	15.60(0.966)

Table 28

Participation in Track and Alcohol Use

	Boys		Girls	
Alcohol Use	No Participation *n*= 242,244,189 $\bar{x}$(SD)	Participation *n*=25,25,21 $\bar{x}$(SD)	No Participation *n*=343,345,299 $\bar{x}$(SD)	Participation *n*=16,17,15 $\bar{x}$(SD)
Alcohol Quantity	-0.6830(2.0666)	-0.9530(1.7492)	-1.0191(1.8604)	-1.0387(2.0250)
Quantity x Frequency	-0.3875(2.4990)	-0.8774(2.0310)	-0.7785(2.2448)	-0.7579(2.2801)
Binge Drinking	-1.5362(1.6062)	-1.4759(1.6035)	-1.4783(1.7130)	-1.4479(1.7919)

Table 29

Participation in Volleyball and Substance Use

	Girls			
	No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	88	13.32(2.287)	1	11.00
Marijuana	113	14.77(1.620)	7	15.43(1.272)
Alcohol	187	14.78(1.477)	9	14.78(1.302)

Table 30

Participation in Volleyball and Alcohol Use

	Girls	
Alcohol Use	No Participation *n*=337,340,293 $\bar{x}$(SD)	Participation *n*=22,22,21 $\bar{x}$(SD)
Alcohol Quantity	-1.0254(1.8539)	-0.9375(2.0728)
Quantity x Frequency	-0.7818(2.2328)	-0.7116(2.4549)
Binge Drinking	-1.4870(1.7068)	-1.3361(1.8472)

Table 31

Participation in Individual Sports and Substance Use

	Boys				Girls			
	No Participation		Participation		No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	69	13.30(2.296)	20	13.25(2.314)	102	13.27(2.139)	11	13.55(2.067)
Marijuana	73	14.33(2.042)	29	14.28(1.750)	109	14.73(1.648)	11	15.55(0.820)
Alcohol	93	14.49(1.943)	40	14.25(1.765)	166	14.72(1.508)	30	15.10(1.185)

Table 32

Participation in Individual Sports and Alcohol Use

	Boys		Girls	
Alcohol Use	No Participation *n*= 198,199,154 $\bar{x}$(SD)	Participation *n*=69,70,56 $\bar{x}$(SD)	No Participation *n*=299,300,259 $\bar{x}$(SD)	Participation *n*=60,62,55 $\bar{x}$(SD)
Alcohol Quantity	-0.7547(2.0495)	-0.5750(2.0115)	-0.9782(1.8662)	-1.2281(1.8603)
Quantity x Frequency	-0.4872(2.4843)	-0.2789(2.4008)	-0.7366(2.2528)	-0.9756(2.2039)
Binge Drinking	-1.5842(1.5636)	-1.3814(1.7094)	-1.4811(1.6780)	-1.4573(1.8902)

Table 33

Participation in Team Sports and Substance Use

	Boys				Girls			
	No Participation		Participation		No Participation		Participation	
Substance	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)	*n*	$\bar{x}$(SD)
Cigarettes	55	13.09(2.205)	34	13.62(2.412)	80	13.30(2.269)	33	13.30(1.759)
Marijuana	62	14.10(1.998)	40	14.65(1.861)	80	14.60(1.733)	40	15.23(1.230)*
Alcohol	78	14.31(1.895)	55	14.58(1.883)	125	14.72(1.574)	71	14.89(1.260)

*p<.05.

Table 34

Participation in Team Sports and Alcohol Use

	Boys		Girls	
Alcohol Use	No Participation *n*= 171,173,138 $\bar{x}$(SD)	Participation *n*=96,96,72 $\bar{x}$(SD)	No Participation *n*=247,248,213 $\bar{x}$(SD)	Participation *n*=112,114,101 $\bar{x}$(SD)
Alcohol Quantity	-0.9490(1.9346)	-0.2794(2.1534)**	-1.0361(1.8232)	-0.9844(1.9618)
Quantity x Frequency	-0.7418(2.3046)	0.1234(2.6403)**	-0.8157(2.1914)	-0.6946(2.3601)
Binge Drinking	-1.6673(1.4423)	-1.2671(1.8535)	-1.5422(1.6702)	-1.3390(1.8033)

**p<.01.

APPENDIX B

Figure 1

First Page of Adolescent Assent Form

ADOLESCENT ASSENT FORM
UNIVERSITY OF DELAWARE
DEPARTMENT OF INDIVIDUAL AND FAMILY STUDIES

You are invited to participate in a research study that will look at what kinds of things (for example, involvement in extracurricular activities, coping abilities) may protect some adolescents from developing problems (such as depression, anxiety, and alcohol/drug abuse). This study is directed by Christine M. Ohannessian, Ph.D., from the Department of Human Development and Family Studies at the University of Delaware. Schools from Delaware, Pennsylvania, and Maryland (including yours) were chosen to participate in this study because the schools include a diverse group of students and parents. All of the students at your school who have participated in this study in the past have been asked to participate. It is estimated that approximately 1,800 individuals will participate.

If you participate, you will be asked to fill out a questionnaire this year and next year. However, if you choose to participate on only one occasion (e.g., this year, but not next year), that is fine. Your questionnaire will ask questions about coping abilities, involvement in extracurricular activities, family relationships, social support, and problem behaviors (including your own and your parents' alcohol and substance use). These are not school tests where you receive a grade. There are no correct answers for the questions that you will be asked. You will be mailed the questionnaire. The questionnaire should take about 40 minutes to complete. After we receive your completed questionnaire, you will receive a $20 gift card.

There is a possibility that you may feel uncomfortable answering the more personal questions. If you feel that any of the questions are too personal, you do not have to answer them. However, it is important to remember that all of the information that you write on the forms will be completely confidential, which means that none of your friends, classmates, parents, or teachers can find out how you answered. You should also know that a code number will be used to identify your questionnaire and names will be kept separately from the questionnaires. All of the questionnaires and names will be stored in separate locked file cabinets in the study director's office space in Delaware. To further help us protect your privacy, we have obtained a Certificate of Confidentiality from the U.S. government. This certificate adds special protection for the research information that we collect from you. More specifically, the researcher cannot be compelled in any federal, state, local, civil, criminal, administrative, legislative, or other proceedings, to identify you, even under a court order or subpoena. Still, we may report probable harm to yourself or others, or probable child abuse, and the government may see your information if it audits us (but they, too, will protect your privacy). In addition, a Certificate of Confidentiality does not prevent you from voluntarily releasing information about yourself and your involvement in this research. This certificate does not mean that the government approves or disapproves of the project.

Although it is unlikely, some of the questions may make you aware of some concerns that you or your family may have. If this occurs, you may want to refer to local resources that might provide you with help. Some local resources are listed at the end of this consent form. You also should know that you have the right to inspect all survey materials. In addition, if you decide to participate in the study, you can change your mind and decide not to participate at any time during the study. If you do change your mind after the study has started and decide not to participate in the study, you will still receive your gift card. Also, if you decide that you do not want to participate in the study, it will not affect your relationship with your school in anyway whatsoever. Hopefully, if you do decide to participate you will learn something about yourself and also help other kids who may have problems.

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Figure 2

Second Page of Delaware Assent Form

If you have any questions about the study at any time, please do not hesitate to contact Dr. Christine Ohannessian (the study director) at (302) 831-3631 or ohanness@udel.edu. If you have questions or concerns about your rights when participating in a research study, please contact the Chair, Human Subjects Review Board, at the Office of the Vice Provost for Research, University of Delaware, Newark, DE 19716 or (302) 831-2136. You may make a copy of this consent form for your records.

Please check the appropriate box below stating whether you agree to participate or not.

☐ **Yes, I will participate** ☐ **No, I will not participate**

_____

Name of Student (Please Print)

_____ _____

Signature of Student **Date**

Delaware Resources

Organization	Contact
Mental Health and Counseling	
Children and Families First of Delaware	(302) 658-5177
Wilmington	(302) 658-5177
Spanish-language services	(302) 655-6486
Delaware Guidance Services for Children & Youth, Inc.	(302) 652-3948
Division of Child Mental Health	
North of the C&D Canal	(302) 633-5128
South of the C&D Canal	(302) 633-2571
Latino American Community Center, Inc.	(302) 655-7338
Mental Health Association in Delaware	(302) 654-6833
Open Door, Inc. (substance abuse treatment services)	(302) 798-9555
Rockford Center (mental health and substance abuse services)	(302) 996-5480
Support Groups	
Mental Health Association in Delaware	(302) 654-6833
Al-Anon Teen/Family Groups	(302) 366-8484
Delaware Association for Children of Alcoholics	(302) 656-5554
Referral and Information Services	
Crisis Hotline (24 hours)	(302) 761-9100
Delaware Helpline, Inc.	(800) 464-4357
Mental Health Association in Delaware	
Children and adolescents	(302) 577-5128
Adults	(302) 577-2484
Mental Health Resource Directory	(302) 654-6833
National Suicide Prevention Hotline	(800) 273-8255

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Figure 3

Second Page of Pennsylvania Assent Form

If you have any questions about the study at any time, please do not hesitate to contact Dr. Christine Ohannessian (the study director) at (302) 831-3631 or ohanness@udel.edu. If you have questions or concerns about your rights when participating in a research study, please contact the Chair, Human Subjects Review Board, at the Office of the Vice Provost for Research, University of Delaware, Newark, DE 19716 or (302) 831-2136. You may make a copy of this consent form for your records.

Please check the appropriate box below stating whether you agree to participate or not.

☐ **Yes, I will participate** ☐ **No, I will not participate**

_____

Name of Student (Please Print)

_____ _____

Signature of Student **Date**

Philadelphia Area Resources

Organization	Contact
Mental Health and Counseling	
The Bridge (counseling and treatment for adolescents with addictions)	(215) 342-5000
Congreso de Latinos Unidos (counseling and substance abuse treatment)	(215) 763-8870
CORA Services (counseling and substance abuse treatment)	(215) 342-7660
Family and Community Service of Delaware County (counseling, treatment)	(610) 566-7540
Family Service of Chester County (counseling)	(610) 696-4900
Family Service of Montgomery County (counseling)	(610) 630-2111
Gaudenzia Outreach I Outpatient Program	(215) 238-2150
John F. Kennedy Community MH/MR Center (substance abuse treatment)	(215) 568-0860
Mental Health Association of Southeastern Pennsylvania	(215) 751-1800
Shalom, Inc. (substance abuse prevention, early intervention, and treatment)	(215) 425-7727
Warren E. Smith Community MH/MR Center (substance abuse treatment)	(215) 455-3900
West Chester Outpatient for Adults and Adolescents	(610) 429-1414
Support Groups	
SEPIA – Southeastern PA Intergroup Association of Alcoholics Anonymous	(215) 923-7900
Referral and Information Services	
Counseling/Crisis/Suicide Hotline	(215) 686-4420
National Suicide Prevention Hotline	(800) 273-8255
Drinking and pregnancy information	http://www.niaaa.nih.gov/publications/brochures.htm

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Figure 4

Second Page of Maryland Assent Form

If you have any questions about the study at any time, please do not hesitate to contact Dr. Christine Ohannessian (the study director) at (302) 831-3631 or ohanness@udel.edu. If you have questions or concerns about your rights when participating in a research study, please contact the Chair, Human Subjects Review Board, at the Office of the Vice Provost for Research, University of Delaware, Newark, DE 19716 or (302) 831-2136. You may make a copy of this consent form for your records.

Please check the appropriate box below stating whether you agree to participate or not.

☐ **Yes, I will participate**

☐ **No, I will not participate**

_____

Name of Student (Please Print)

_____ _____

Signature of Student **Date**

Maryland Resources

Organization	Contact
Mental Health and Counseling	
Family and Children's Services of Central Maryland	(410) 366-1980
First Step Community Counseling and Resource Center	(410) 628-6120
The National Family Resiliency Center	(410) 740-9553
Mental Health Association of Maryland	(800) 572-6426 (410) 235-1178
Support Groups	
Al-Anon and Alateen	(888) 4AL-ANON (410) 766-1984
Alcoholics Anonymous	(410) 663-1922
The Children's Guild	(410) 444-3806
Referral and Information Services	
Maryland Crisis Hotline	(800) 422-0009
Catholic Charities	(410) 261-5800
National Suicide Prevention Hotline	(800) 273-8255
General Information	
The Family Works	1-877-WE-R-FMLY
Mental Health Association of Maryland	(800) 572-6426 (410) 235-1178
FatherhoodMD.org	(410) 767-4982

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Figure 5

How I Spend My Time Survey

HOW I SPEND MY TIME

We would like for you to tell us how you spend your time. Please indicate how much time you were involved in the following activities during the past year by circling the appropriate number (if your involvement was seasonal; e.g., football season, respond in relation to that season).
For each activity, please circle one of the following:

1 = No involvement
2 = Less than once a week
3 = About once a week
4 = 2-3 days a week
5 = More than 3 days a week
6 = Every day

	No Involvement	Less Than Once A Week	About Once A Week	2-3 Days A Week	More Than 3 Days A Week	Every Day
1. Sports If involved, which sport? _____	1	2	3	4	5	6
2. Fine Arts If involved, what activity? (e.g., band, chorus, drama, dance) _____	1	2	3	4	5	6
3. School Clubs If involved, which club? _____	1	2	3	4	5	6
4. Paid Work	1	2	3	4	5	6
5. Volunteer Work	1	2	3	4	5	6
6. Religious Activities	1	2	3	4	5	6
7. Hanging out With Friends	1	2	3	4	5	6
8. Playing on the computer (Internet, games, e-mail)	1	2	3	4	5	6
9. Playing video games (PlayStation, Nintendo, etc.)	1	2	3	4	5	6
10. Scouting activities	1	2	3	4	5	6

Figure 6

First Use of Substances Survey

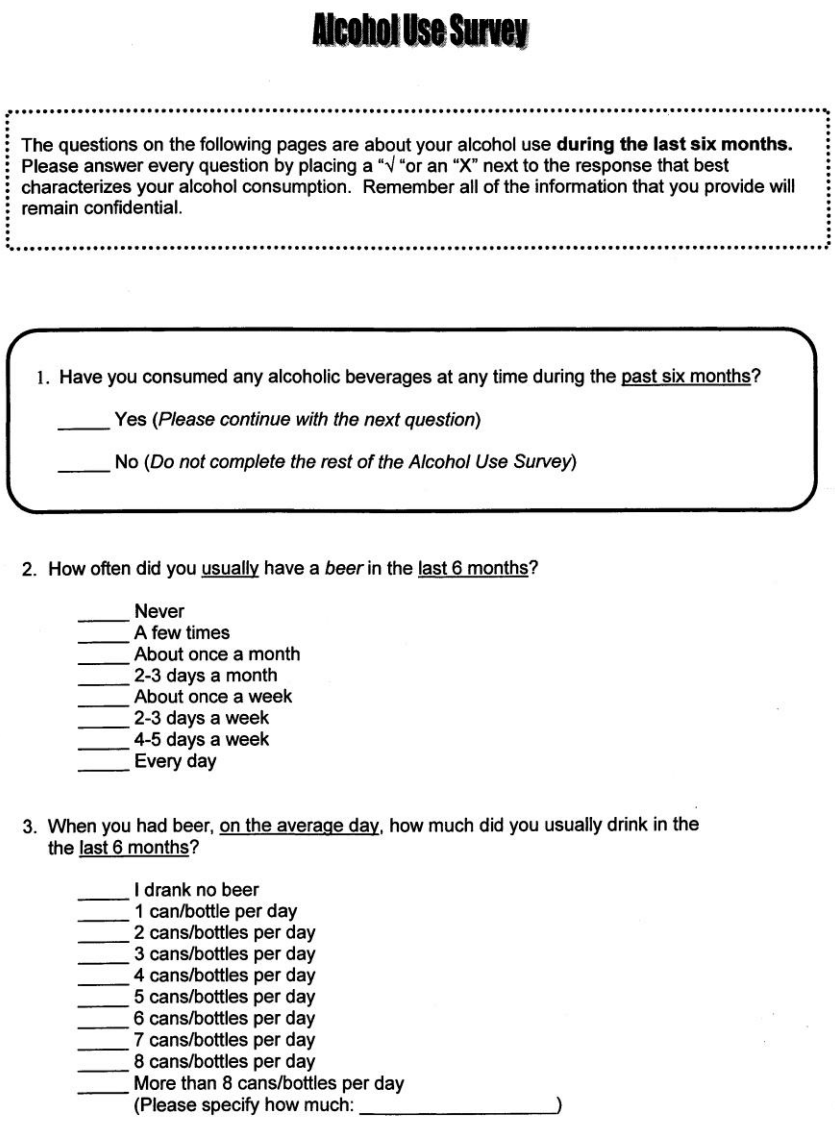
First Use

Below are a number of things you may or may not have done in your life. If you have never done the activity, check the space marked **"Never"**; otherwise please specify the **age at which you first did the activity.** Please respond to every item.

1.	Smoked your first cigarette	Age____ or Never___
2.	Smoked cigarettes every day	Age____ or Never___
3.	Tried smokeless tobacco (chewing tobacco, snuff)	Age____ or Never___
4.	Tried marijuana (grass, pot) or hashish	Age____ or Never___
5.	Tried amphetamines (uppers, speed)	Age____ or Never___
6.	Tried someone else's Adderall or Ritalin	Age____ or Never___
7.	Tried "crack" cocaine (rock)	Age____ or Never___
8.	Tried any other form of cocaine	Age____ or Never___
9.	Tried barbiturates or sedatives (downers, Valium, Quaaludes)	Age____ or Never___
10.	Tried antacins	Age____ or Never___
11.	Tried hallucinogens (LSD, PCP, mushrooms)	Age____ or Never___
12.	Tried MDMA (Ecstasy)	Age____ or Never___
13.	Tried opiates (heroin, morphine, OxyContin)	Age____ or Never___
14.	Tried inhalants (sniffing glue, paint, poppers, gas, etc.)	Age____ or Never___
15.	Tried steroids	Age____ or Never___
16.	Drank alcohol (without parents present)	Age____ or Never___

Figure 7

Alcohol Use Survey



Alcohol Use Survey

The questions on the following pages are about your alcohol use **during the last six months.** Please answer every question by placing a "√ "or an "X" next to the response that best characterizes your alcohol consumption. Remember all of the information that you provide will remain confidential.

1. Have you consumed any alcoholic beverages at any time during the past six months?

   _____ Yes (*Please continue with the next question*)

   _____ No (*Do not complete the rest of the Alcohol Use Survey*)

2. How often did you usually have a *beer* in the last 6 months?

   _____ Never
   _____ A few times
   _____ About once a month
   _____ 2-3 days a month
   _____ About once a week
   _____ 2-3 days a week
   _____ 4-5 days a week
   _____ Every day

3. When you had beer, on the average day, how much did you usually drink in the the last 6 months?

   _____ I drank no beer
   _____ 1 can/bottle per day
   _____ 2 cans/bottles per day
   _____ 3 cans/bottles per day
   _____ 4 cans/bottles per day
   _____ 5 cans/bottles per day
   _____ 6 cans/bottles per day
   _____ 7 cans/bottles per day
   _____ 8 cans/bottles per day
   _____ More than 8 cans/bottles per day
   (Please specify how much: _____)

4. How many times did you drink 6 or more cans/bottles of beer in the last 6 months? Please fill in the number of times here: _____

5. How often did you usually have *wine or wine coolers* in the last 6 months?

   _____ Never
   _____ A few times
   _____ About once a month
   _____ 2-3 days a month
   _____ About once a week
   _____ 2-3 days a week
   _____ 4-5 days a week
   _____ Every day

6. When you had *wine*, on the average day, how much did you usually drink in the last 6 months ? (1 wine cooler = 1 glass of wine)

   _____ I drank no wine
   _____ 1 glass per day
   _____ 2 glasses per day
   _____ 3 glasses per day
   _____ 4 glasses per day
   _____ 5 glasses per day
   _____ 6 glasses per day
   _____ 7 glasses per day
   _____ 8 glasses per day
   _____ More than 8 glasses per day
   (Please specify how much: _____)

7. How many times did you drink 6 or more glasses of wine in the last 6 months? Please fill in the number of times here: _____

8. How often did you usually have a drink of *liquor* (whiskey, vodka, gin, mixed drinks, etc.) in the last 6 months?

   _____ Never
   _____ A few times
   _____ About once a month
   _____ 2-3 days a month
   _____ About once a week
   _____ 2-3 days a week
   _____ 4-5 days a week
   _____ Every day

9. When you drank *liquor*, on the average day, how many drinks did you usually have in the last 6 months?

_____ I drank no liquor
_____ 1 drink per day
_____ 2 drinks per day
_____ 3 drinks per day
_____ 4 drinks per day
_____ 5 drinks per day
_____ 6 drinks per day
_____ 7 drinks per day
_____ 8 drinks per day
_____ More than 8 drinks per day
(Please specify how much: _____)

10. How many times did you have 6 or more drinks of liquor in the past 6 months?
Please fill in the number of times here: _____

11. How much liquor did an average drink contain?
Please specify number of shots/ounces _____ (*Note* 1 shot = 1 ounce)

12. How many times did you drink **5 or more** alcoholic drinks (cans/bottles of beer, glasses of wine, drinks containing liquor) in the last 6 months?

Please fill in the number of times here: _____