A Dissertation

entitled

Social Resiliency Factors and Abstinence from Substance Abuse

in Lucas County, Ohio Adolescents

by

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Submitted to the Graduate Faculty as partial fulfillment of

the requirements for the Doctor of Philosophy Degree in Counselor Education

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An Abstract of
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Adolescent alcohol and other drug (AOD) use is a serious problem in the United States which often results in grave consequences to individuals and society. Research into adolescent AOD use has traditionally focused on identifying risk factors that may aid in identifying youth in need of intervention and/or treatment for AOD problems. The resiliency perspective has developed as an alternative to the risk-factor orientation to research and intervention in adolescent AOD use. Researchers using the resiliency approach aim to provide insight into why many adolescents, despite exposure to multiple risk-factors, do not use substances. Examples of social resiliency factors proposed to be protective of adolescent AOD include volunteering, sports, religious, arts, and civic activities. Advantages of the resiliency approach have included simultaneous consideration of both risk and protective factors, examination of how multiple systems
interact to affect young people, and efficacy in proactively preventing AOD use in adolescent versus addressing problems after they have been initiated.

The purpose of this study was to identify social resiliency factors that may predict abstinence from the use of AOD in students attending Lucas County, Ohio, schools in grades 10 through 12 utilizing data from the 2006 Lucas County (Ohio) Alcohol and Drug Addiction Services (ADAS) Board Youth Alcohol & Other Drug Use Survey. The specific resiliency factors examined were participation in sports or athletic activities, arts or civic activities, religious activities, volunteering or community activities, and alcohol or drug prevention clubs. The drugs of abuse examined include tobacco, alcohol, and marijuana. A Chi square analysis was employed to examine if each resiliency activity (independent variables) was predictive of abstinence from the use of tobacco, alcohol, and marijuana use (dependent variables).

Results supported previous research indicating that sports and athletic activities may be somewhat protective against use of cigarettes, but not for alcohol, especially in males. Significant results were found for females for arts and civic activities, religious activities, and volunteering and community activities. However, results for males for each of these resiliency factors were negative, with the exception of religious activity and marijuana. Significance for participation in drug and alcohol prevention clubs was not found for any group or substance. Differences in independent variable measurement issues may be factors in the lack of consistency in results. Non-participation in several of the resiliency activities was found to be associated with substance use, especially in females.
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Although the road to my Ph.D. has often seemed long and lonely, I know I have never really been alone. I am indebted to several people, without whom I could have never even started, much less made it successfully to the finish. First, and always most importantly, is my wonderful, beautiful, and intelligent daughter, Gina. I cannot thank her enough for her patience, assistance, and, at times, her nursing skills. I also want to acknowledge my brother, Joe, and his family, as well as all my friends, including Dan, Marti, Deirdre, and many others, for their efforts in helping me maintain my sanity while I walked the doctoral road.

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Chapter One

Introduction

Adolescent alcohol and other drug (AOD) use is a well-documented problem in the United States that continues despite extensive efforts at problem identification and intervention (Meschke & Patterson, 2003). Adolescent AOD use often has great negative consequences for individual young people including addiction and other negative health effects, mental health problems such as depression, interpersonal problems with family and peers, and injury or death from automobile accidents. Additionally, adolescent AOD use has serious social and economic effects on families and society as a whole (Chen, Sheth, Elliott, & Yeager, 2004). French et al. (2002) found that the average per person cost of outpatient marijuana treatment alone “ranged from $837 to $3,334 per episode” (p. 84). Costs for inpatient treatment for marijuana and other substance abuse were considerably higher, resulting in billions of dollars spent annually for adolescent substance abuse treatment. Other serious consequences often have more lasting negative effects on the lives of adolescents, as well as their families and communities. These consequences include traffic injuries and deaths, illness, school and family-related problems, and suicide (Wodarski, 1990).
Chen et al. (2004) identified adolescent AOD use as “one of the most prevalent social problems in the United States” (p. 413). There have been several large scale efforts to measure and monitor this problem including the Monitoring the Future (MTF) project (Johnson, O’Malley, Bachman, & Schulenberg, 2007), the Youth Risk Behavior Surveillance System (YRBSS) survey by the Centers for Disease Control and Prevention (CDC), and the Substance Abuse and Mental Health Services Administration’s (SAMHSA) National Survey on Drug Use and Health. Additionally, state and local groups, such as the Lucas County (Ohio) Alcohol and Drug Addiction Services (ADAS) Board, have made efforts to measure and monitor the problem locally.

Research in this area has traditionally focused on identifying risk factors that may be of aid in identifying youth in need of intervention and/or treatment for AOD problems. Prevention efforts have also been targeted at young people exposed to these risks. Hawkins, Catalano, and Miller (1992) provided a comprehensive review of identified risk factors, or “precursors” (p. 65), that may affect or influence adolescents to engage in AOD use.

Hawkins et al. (1992) described two broad categories of risk factors. The first, termed socio-cultural factors, includes widespread influences that affect large groups of people or society as a whole. Examples include poverty, population density, crime rates, local AOD laws, and commitment of law enforcement to enforce those laws. Individual/interpersonal factors comprise the second category identified by Hawkins et al. These factors include biochemical influences, impulse control, conflicts with family and peers, and individual tendencies to self medicate with AOD to alter negative emotional states. Drawbacks to exclusive use of the risk factor approach to the problem of adolescent AOD use include focusing on young people already using AOD rather than
those that have avoided doing so, stigmatizing disadvantaged populations, and the
difficulty of performing empirical research in the area.

A resiliency perspective has been offered as an alternative to the risk-factor
orientation to research. Researchers using the resiliency approach aim to provide insight
into why many adolescents, despite exposure to multiple risk-factors, do not use
substances. Additionally, use of the resiliency approach may help prevent substance
abuse by identifying and promoting factors that influence adolescents to avoid AOD use
and abuse. This approach has several advantages including simultaneous consideration of
both risk and protective factors, examination of how multiple systems interact to affect
young people, and efficacy in proactively preventing AOD use in adolescent versus
addressing problems after they have been initiated.

Wolkow and Ferguson (2001) identified several potential drawbacks to the
resiliency approach including the current lack of empirical support for the concept and
potential difficulty in persuading parents, as well as school and community leaders, to
change established ways of looking at adolescent AOD use. Despite these drawbacks, the
resiliency approach shows promise in developing an alternative way of addressing the
problem of adolescent AOD use.

Resiliency has been described by Meschke and Patterson (2003) as an adaptive
strategy or process in reaction to environmental or individual stressors. These authors
described an “ecosystems perspective” (p. 485) involving three interactive systems that
positively affect adolescent AOD use. The first system, referred to as microsystems,
includes factors that affect adolescents directly including family, school, and peer
relationships. The second, termed mesosystems, involve indirect influences on
adolescents such as workplace stress that affect the ability of parents, teachers, and other
mentors to interact positively with young people. Finally, macrosystems are broad social, economic, and political conditions that affect large populations. Examples include cultural attitudes toward AOD use, economic conditions, and the presence of discrimination against minorities or other groups. Goldstein and Brooks (2005) also described resiliency as an adaptive process. They postulated that interactions between individual, family, and social factors contribute to adolescent values and behavior regarding AOD use.

Within the categories described by Meschke and Patterson (2003) and Goldstein and Brooks (2005), multiple specific potential social resiliency factors can be identified. Five of these specific factors were examined in this study. The first is sports and athletic activities, activities that are often proposed to be protective against adolescent AOD use. Research in this area is mixed, but appears to show that sports and athletic participation is less protective against alcohol use than other substances, especially among males (Harrison & Narayan, 2003; Moore & Werch, 2005; Pate, Heath, Dowda, & Trost, 1996).

The second factor examined, religious participation, has also been commonly identified as a potentially positive influence because religious values are often thought to be inconsistent with AOD use. Again, research in this area is mixed. A review of the literature revealed that protection may vary by religious denomination and depend more on the degree to which adolescents have internalized the values and beliefs of their specific religion, rather than merely on whether they participate in worship or associated activities (Benda, Pope, & Kelleher, 2006; Francis, 1997; Heath et al., 1999; Hodge, Cardenas, & Montoya, 2001; Nonnemaker, McNeely, & Blum, 2003).

The third factor to be examined was arts and civic activities. The review of the literature revealed this to be a somewhat broad category and researchers often combined
activities in differing and inconsistent ways. For example, Eccles and Barber (1990) combined debate and chess clubs with “performance activities” (p. 14), while Duncan, Duncan, Strycker, and Chaumeton (2002) grouped ethnic clubs with music and “arts and crafts” (p. 429) activities. Consequently, there appears to be little consensus as to whether arts and civic activities in general are protective. Eccles and Barber noted, however, that adolescents who participate in these endeavors are generally supervised, limiting the opportunities for indulgence in AOD use. They also noted that, especially in the case of civic activities, adolescents who chose to engage in these endeavors already identified with the prosocial values espoused by the programming and as such were self-selecting.

The fourth factor investigated in this study was volunteering and community activities, which includes participation in scouting, 4-H, YMCA, and other similar programming. Examination of research in this area was difficult for the same reasons noted in the section on arts and civic activities. Specifically, researchers (Duncan, et al., 2002; Eccles & Barber, 1999) defined the category inconsistently and included different activities. Additionally, Eccles and Barber (1999) argue that any protective effects found may be due to adult supervision of the activities and prior identification with established values of these programs.

Finally, the potential protective effects of participation in AOD drug prevention programs was examined. Early efforts at primary prevention were found to be ineffective due to erroneous assumptions regarding approaches that would be effective in persuading adolescents to avoid AOD use (Donaldson et al., 1996). In the 1980s, however, social influences were found to be a major reason adolescents engaged in AOD use (Donaldson et al.) and programming based on this assumption was developed. There are a great number of AOD prevention programs that address varying social influences. Common
aspects of these programs include education regarding the physical effects of AOD use, presentation of accurate information regarding the prevalence of AOD use, assertion refusal skills instruction and practice, and information regarding the influence of culture, including the media.

Although many programs claim efficacy, Gorman and Conde (2007) noted that most are self-evaluated. Multiple researchers (Donaldson et al., 1996; Hansen, Dusenbury, Bishop, & Derzon, 2007; Hawkins et al., 1992; VanderWaal, Powell, Terry-McElrath, Bao, & Flay, 2005), however, have noted that the most successful programs combine primary prevention with community measures, such as limiting the availability of AOD to adolescents, providing supervised activities, and enforcing laws regarding AOD use by young people. Additionally, prevention programs that involved active participation by adolescents were found to be more beneficial than those that were didactic only.

1.1 Statement of the problem

The consequences of AOD use by young people are potentially grave to individual adolescents, families, and society as a whole. Despite decades of research into AOD risk factors, as well as efforts at prevention and treatment, adolescent AOD use continues to remain a serious health problem. Understanding risk factors associated with adolescent AOD use is undoubtedly valuable in identifying and intervening with young people who are, or may potentially begin, using substances. Lack of sufficient knowledge of social resiliency factors, however, limits opportunities for counselors and other provider’s to help adolescents prevent AOD use before exposure to risk factors results in initiation of use.
As previously discussed, research to date suggests that social resiliency factors may encourage abstinence from AOD among adolescents. Better prevention through more thorough knowledge of effective social resiliency factors may have several important benefits that counselors, young people and their families, as well as society in general would not enjoy if the study of this subject is not advanced. For example, if fewer adolescents initiate AOD use and subsequently require treatment, less money may be required for intervention. Schools, government, and social service agencies will be able to make more effective use of their funding for adolescent AOD prevention programs by encouraging social resiliency activities to supplement their current approaches. School systems may be better able to justify and attain funding for sports, arts, and other programming if social resiliency factors can be shown to decrease adolescent AOD use. The understanding of effective social resiliency activities would provide counselors with an additional approach to helping adolescents avoid AOD use, as well as possibly those recovering from AOD use disorders in treatment, by developing positive interests and a healthy support system. Finally, knowledge of effective social resiliency activities could be an effective tool to help parents protect their children from engaging in AOD use.

1.2 Purposes of the Study

The purpose of this study was to retrospectively explore social resiliency factors that may predict abstinence from the use of AOD in students attending Lucas County, Ohio, schools in grades 10 through 12 using data from the 2006 A.D.A.S. Student Survey. The specific resiliency factors examined were sports or athletic activities, arts or civic activities, religious activities, volunteering or community activities, and participation in alcohol or drug prevention clubs. The drugs of abuse examined included tobacco, alcohol, and marijuana.
1.3 Research Questions

This experimenter investigated the following five research questions by grade level and frequency of participation in each activity.

1. Is participation in sports or athletic activities by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of tobacco, alcohol, or marijuana?

2. Is participation in arts or civic activities by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of tobacco, alcohol, or marijuana?

3. Is participation in religious activities by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of tobacco, alcohol, or marijuana?

4. Is participation in volunteering or community activities by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of tobacco, alcohol, or marijuana?

5. Is participation in alcohol and drug prevention clubs by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of tobacco, alcohol, or marijuana?

1.4 Significance of the Study

This study was believed to be important in several ways. First, it was hoped that results could be used to assist counselors, educators, and others involved with helping young people better understand how many adolescents who appear to be at risk for AOD use avoid doing so. Providers may then be able to develop ways of helping at-risk youth avoid using substances by encouraging participation in activities that offer protection
against AOD use. Additionally, the information provided by this study may be helpful in securing state and federal funding to support further research into adolescent AOD use prevention. Finally, results from this research would provide information valuable to future researchers wishing to further study the relationship between adolescent AOD abstinence and potential social resiliency factors.

1.5 Definition of Terms

The following terms were operationally defined as they were conceptualized and used in this study.

**AOD** refers to Alcohol and Other Drugs.

**AOD use** refers to the consumption of alcohol or other drugs.

**Substance abuse** and **drug abuse** refer to any AOD use to the degree that an individual experiences legal problems or significant impairment in school, work, family, social, interpersonal, or physical functioning due to their use of substances (American Psychiatric Association, Diagnostic and Statistical Manual, Fourth Edition, Text Revision [DSM-IV-TR], 2000).

**Risk factors** are defined as aspects or traits of the individual, his or her environment, or an interaction of both that increase the probability that an adolescent will engage in AOD use.

**Resiliency factors**, also referred to as **protective factors**, are defined as aspects or traits of the individual, his or her environment, or an interaction of both that decrease the probability that an adolescent will engage in AOD use.

1.6 Organization of Chapters

Chapter One provides an overview of this dissertation. Topics covered include a statement of the problem and relevant background information, the purpose of the study,
the specific research questions that will be addressed, and the significance of the study. Additionally, definitions of terms being used in this proposal were provided.

Chapter Two is a literature review that provides background into the problem of co-morbid mental health issues and substance use and abuse in adolescents. Relevant research in this area is described.

Chapter Three describes the method used in this study including research design, description of participants, sampling procedures, instrumentation, administration procedures, statistical hypotheses, data analysis, and a statement of limitations.

Chapter Four provides the results obtained in this study. A reliability analysis of the 2006 Lucas County (Ohio) Alcohol and Drug Addiction Services (ADAS) Board Youth Alcohol & Other Drug Use Survey is presented, followed by descriptions of data preparation, sampling, and analysis procedures. The results of the analyses for the five research questions are then presented.

Chapter Five is a discussion of the results of this study. It begins with an overview of the five social resiliency factors examined in the study and the method employed in the analysis. The results obtained for each research question are then discussed, followed by suggestions regarding clinical implications and recommendations for future research.
Chapter Two

Review of the Literature

2.1 Introduction

Despite several decades of effort toward prevention and treatment, adolescent alcohol and other drug (AOD) use remains a serious problem for the young people who use substances, and for friends, families, and society as well (Meschke & Patterson, 2003). The National Highway Traffic Safety Administration (NHTSA) found that in 2006, 19 percent of drivers age 15 to 20 killed in automobile accidents had a blood alcohol level equal to or greater than .08 grams per deciliter. For reference, the legal maximum blood alcohol level for persons age 20 or less in Ohio is .02 (Ohio State Highway Patrol, 2007). These accidents resulted in the death of 1,350 drivers in this age group, compared to 2,145 among 21 to 24 year olds, 3,259 among 25 to 34 year olds, and 2,595 among 35 to 44 year olds.

Although death is certainly the most serious consequence of adolescent AOD use, substance use by young people can also result in serious health problems and damaged family relationships. Adolescent AOD use may also result in economic losses which may include medical treatment for injuries and other AOD-related health problems, mental
health and substance abuse treatment costs, lost productivity in school and the workplace, and accident-related community expenditures (Wodarski, 1990).

Hawkins et al. (1992) provide an excellent review of multiple studies that have examined possible correlations between risk factors thought to be associated with adolescent AOD use. Identified risk factors include socio-cultural problems, such as availability of AOD and norms regarding their use. Other risk factors include individual factors, such as academic performance and behavior problems.

Not all adolescents, however, become involved in AOD use even when exposed to multiple risk factors. A more recent approach in the research of adolescent AOD use focuses on identifying protective, or resiliency, factors that are associated with young people who do not use substances. Termed the “resiliency perspective” (Meschke & Patterson, 2003, p. 484) this line of research seeks to answer the question ‘what goes right’ with drug resistant youth, rather than ‘what went wrong’ with those already using substances. The resiliency approach uses a strengths perspective and examines the issue in terms of prevention, rather than identifying young people already using substances. The theory is that if protective factors can be identified and encouraged in adolescents, the degree of adolescent AOD use may be reduced. Consequently, the need for treatment and the economic impact of AOD use should also be reduced.

This chapter begins with a brief review of the literature regarding the prevalence and negative consequences of adolescent substance use and abuse. The risk factor perspective is then compared to the resiliency approach. The focus and application of both are described. History, methods, and results of applicable research studies are described throughout.
2.2 Adolescent Substance Use and Abuse

2.2.1 Prevalence

Chen et al. (2004) identify adolescent AOD use as “one of the most prevalent social problems in the United States” (p. 413) and state that identifying the extent of the problem is the essential first step in effectively addressing the issue. Several research groups have undertaken large scale efforts to periodically measure the prevalence of AOD use among American adolescents. One of the most extensive and often cited projects is the Monitoring the Future (MTF; Johnson et al., 2007) school-based survey, sponsored by The National Institute on Drug Abuse (NIDA). Johnson et al. surveyed AOD use trends among American adolescents annually from 1975 to the present. Young people in grade 12 have been surveyed since the project began, while 8th and 10th graders were added only in 1991.

The authors of the MTF project captured data regarding adolescent AOD use in four areas including frequency of use over the lifespan, in the past 12 months, and in the past 30 days prior to the survey, as well as perceived risk associated with AOD use, disapproval of use, and perceived availability of alcohol and other drugs. The 2006 MTF data for alcohol, marijuana, and cigarette use by 8th, 10th, and 12th graders are summarized in Table 2-1.

As Wodarski (1999) noted, AOD use patterns are often initiated in adolescence. This makes the proportion of young people who reported having five or more drinks in the past two weeks particularly alarming, given the potentially devastating consequences of the excessive use of alcohol over the lifespan.

Another large scale effort to measure the use of alcohol and other substances, The Youth Risk Behavior Surveillance System (YRBSS), was initiated by the Centers for
Disease Control (CDC) in 1989 (as cited in Kahn, 2002). YRBSS researchers have conducted national, state, and local school-based surveys of adolescents in grades 9 through 12 biennially beginning in 1991. The 2005 YRBSS report found prevalence rates for alcohol, marijuana, and cigarettes similar to MTF 2006 data.

Table 2-1: Summary of 2006 MTF Data in Percent of Students Using by Grade

<table>
<thead>
<tr>
<th>Measured Parameter</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8th</td>
</tr>
<tr>
<td>Alcohol use in:</td>
<td></td>
</tr>
<tr>
<td>Lifetime</td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>40</td>
</tr>
<tr>
<td>Been drunk</td>
<td>19.5</td>
</tr>
<tr>
<td>Past Year</td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>33.6</td>
</tr>
<tr>
<td>Been drunk</td>
<td>13.9</td>
</tr>
<tr>
<td>Last 30 days</td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>17.2</td>
</tr>
<tr>
<td>Been drunk</td>
<td>6.2</td>
</tr>
<tr>
<td>Daily</td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>0.5</td>
</tr>
<tr>
<td>Been drunk</td>
<td>0.2</td>
</tr>
<tr>
<td>+5 drinks in the past 2 weeks</td>
<td>10.9</td>
</tr>
<tr>
<td>Marijuana use in:</td>
<td></td>
</tr>
<tr>
<td>Lifetime</td>
<td>15.7</td>
</tr>
<tr>
<td>Last year</td>
<td>11.7</td>
</tr>
<tr>
<td>Last 30 days</td>
<td>6.5</td>
</tr>
<tr>
<td>Cigarette use in:</td>
<td></td>
</tr>
<tr>
<td>Lifetime</td>
<td>24.6</td>
</tr>
<tr>
<td>Last 30 days</td>
<td>8.7</td>
</tr>
<tr>
<td>Daily</td>
<td>4</td>
</tr>
</tbody>
</table>

Specifically, YRBSS researchers found that in the 30 days prior to the 2005 survey, 43.3 percent of high school students reported they had consumed alcohol, 20.2 percent said they had used marijuana, and 23.0 percent admitted they had smoked cigarettes.

Additionally, 9.9 percent of adolescents surveyed admitted they had operated a motor
vehicle after using alcohol and 28.5 percent reported they had ridden one or more times in a vehicle operated by someone who was under the influence of alcohol (YRBSS, 2006).

The National Survey on Drug Use and Health conducted by the Substance Abuse and Mental Health Services Administration (SAMHSA, 2005) also found similar statistics. In the month prior to the 2005 survey, 6.8 percent of young people age 12 to 17 reported marijuana use, 16.5 percent said they had used alcohol, and 10.8 percent admitted to smoking cigarettes. Additionally, 8.3 percent of adolescents age 16 to 17 surveyed admitted they had operated a motor vehicle after using alcohol.

In addition to national surveys, many smaller research groups have endeavored to measure adolescent AOD prevalence rates in smaller local, ethnic, or specific age group populations. The Lucas County (Ohio) Alcohol and Drug Addiction Services (ADAS) Board Student Survey, which will be used in this study, is one example.

2.2.2 Research on Negative Consequences

Alcohol, tobacco, and marijuana use by young people is associated with multiple negative consequences. In its review of the 2005 YRBSS data, the U.S. Centers for Disease Control and Prevention provided an overview of problems associated with adolescent substance use. Several psychological disorders are associated with substance use in young people including depression and anxiety. Physical consequences may include physiological addiction, as well as organ damage from drug effects such as decreased lung capacity and asthma from smoking. AOD use by young people may also result in negative social consequences such as isolation from peers and adults, stigmatization, as well as poor social and school performance. The negative consequences of alcohol and other drug use by adolescents may be difficult to overcome and have extensive, lasting effects well into adulthood (Meschke & Patterson, 2003).
2.3 Approaches to Research and Application

2.3.1 Risk factor perspective

The goal of research that focuses on risk factors is to identify socio-economic and biopsychosocial factors that are correlated with adolescent AOD use (Hawkins et al., 1992). Participants in such studies are generally young people who report using alcohol and/or other drugs, rather than those who abstain. Data collected in the MTF and YRBSS surveys have been used to look for risk factors that correlate with AOD abuse. Identified risk factors include poor academic performance, negative peer influences, and easy availability of alcohol and other drugs (Hawkins et al.).

Hawkins et al. (1992) describe risk factors as “precursors” (p. 65) of adolescent AOD use and divide them into two categories: socio-cultural factors and individual/interpersonal factors. Socio-cultural factors include laws and social norms related to AOD use, availability of alcohol and drugs, and poverty. The authors also identify “neighborhood disorganization” (p. 81) as a significant factor in adolescent AOD use. Neighborhood disorganization includes variables such as transience and lack of neighborhood commitment, population density, deterioration of buildings, high crime rates, and lack of behavioral monitoring by residents and law enforcement officials.

Individual and interpersonal factors thought to contribute to adolescent AOD use are varied and include biochemical conditions that contribute to individual variation in alcohol metabolism or impulse control and sensation seeking. Hawkins et al. (1992) report that an adolescent’s family attitudes and behavior in regard to AOD use is highly influential, as well as family conflict and inadequate emotional bonding between parents and children. Additionally, early problematic behavior in childhood, poor academic performance and low commitment to school, rejection by peers in early childhood, and
association with AOD using peers are thought to influence adolescent AOD. Additionally, risk factors are thought to be additive and not easily altered, explaining the persistence of AOD use in the adolescent population.

Related to risk factor theory is the self medication hypothesis (Damphouse & Kaplan, 1998). Proponents of this perspective assume that some adolescents use AOD to avoid or mediate negative emotions due to external stressors and/or internal mental or emotional disorders. Consequently, such adolescents may eventually be dually diagnosed (e.g., depression and/or anxiety and a substance use disorder), thus complicating both treatment and potential negative consequences of AOD use.

The most obvious and practical application of this line of research is to identify adolescents who may be in need of treatment for a substance use disorder. Additionally, such research may identify associated risk factors that may be eliminated or alleviated in an effort to prevent and/or decrease adolescent AOD use. It should be noted, however, that many risk factors, such as economic deprivation, are not easily amenable to intervention.

There are several drawbacks to the risk factor perspective. First, risk factor research is difficult to use in the development of prevention programs as it tends to focus on adolescents who are already using alcohol or other substances. This perspective also encourages stigmatization as it tends to paint whole groups, such as the economically disadvantaged, with the same brush. The danger is that consumers of risk factor perspective research may negatively view entire groups of young people, such as those from poor families and economically disadvantaged neighborhoods, as highly likely to indulge in alcohol or substances, while perceiving those from more affluent backgrounds as less likely to use. Perhaps most importantly, risk factor perspective research often
blatantly ignores the fact that the vast majority of young people, many of whom experience multiple risk factors, do not use alcohol or other substances (Hawkins et al., 1999; Meschke & Patterson, 2003; Wolkow & Ferguson, 2001) For obvious ethical reasons, risk factor studies can only be correlational and no empirical investigation of how any individual risk factor may cause AOD use can be performed. The study of protective factors, which can be tested, would appear to be of more value in understanding the prevention of adolescent AOD use.

2.3.2 Resiliency perspective

Resiliency researchers look at adolescent AOD use from a strengths perspective, consistent with the educational and strengths-based paradigm frequently used in the counseling profession. Multiple authors (Hawkins et al., 1999; Meschke & Patterson, 2003; Wolkow & Ferguson, 2001) have noted that risk factor perspective research has shown that not all young people who experience risk factors become involved in AOD use and abuse. Consequently, risk factor perspective research does not shed light on what may be protecting, or encouraging, young people to abstain from AOD use. Thus, the resiliency approach may suggest practical applications in preventive programs targeting individuals, families, peers, and the community. If resiliency factors were shown to increase resistance against adolescent AOD use, more targeted programs could be developed.

Meschke and Patterson (2003) define resiliency as “the process by which successful developmental or adaptive outcomes occur within a high-risk environment and/or stressful circumstances” (p. 484). If risk factors can be considered “precursors” (Hawkins et al., 1992, p. 65) of adolescent AOD use, protective factors can likewise be considered precursors, or “moderators” (Hawkins et al., 2004, p. 213), of adolescent
AOD abstinence. Some resiliency factors, such as academic achievement and parental support, may be viewed as the opposite of previously identified risk factors. Other factors, however, such as religious participation, positive health habits, and involvement in school activities, including school and community AOD prevention programs, are not.

Bandura (1999) noted that the traditional focus on identifying risk factors predictive of AOD abuse has caused us to “grossly over-predict psychopathology and the inability to overcome substance abuse” (p. 214). He acknowledged that environmental cuing and negative affect have most often been employed to explain AOD abuse and relapse, but also observed that many people have overcome serious addictions to tobacco, alcohol, and other drugs on their own via “natural recovery processes” (p. 214), without formal AOD abuse treatment. He described these phenomena behaviorally in terms of interaction between the environment and the individual. Bandura also proposed a socio-cognitive theory of substance abuse that emphasized the importance of high self-efficacy and self-regulation skills in the avoidance of substance abuse.

The resiliency approach has several advantages. First, it looks at both risk and protective factors (Hawkins et al., 1992). As previously discussed some proposed resiliency factors can be interpreted as the opposite of a known risk factor, such as parental support and monitoring, while others, such as religious participation are not. Bogenschneider (1996) proposed that the use of both approaches may provide the most effective and comprehensive way of addressing the adolescent AOD use problem.

Second, the resiliency approach takes into account interactive systems that influence adolescent AOD use. These systems are dynamic and “constantly changing as individuals and larger social systems are bolstered by good fortune and challenged by adversity” (Waller, 2001, p.5). Waller divides these systems into two categories:
(a) internal, which includes such attributes as intelligence, temperament, and emotional regulation; and (b) external, which encompasses family, community, and cultural factors. These two systems are thought to operate interdependently and influence each other and offer a more complex, yet realistic, understanding of why adolescents do or do not use substances.

Third, examination of resiliency factors most likely offers more opportunity to develop proactive preventive measures against adolescent AOD use that are empirically verifiable. If resiliency factors, either singly or in combination, can be empirically shown to be effective deterrents of adolescent AOD use in at-risk populations, educators and others who interact with young people would have much more effective intervention tools and the personal and societal cost of adolescent AOD use may be greatly reduced.

The last advantage of the resiliency approach is that it takes into account the dynamic interaction of all resiliency processes (Meschke and Patterson, 2003). Rather than addressing risk factors individually, resiliency approach researchers assert that protective factors are cumulative, that is, the presence of increasing numbers of factors combine to reduce the risk of AOD use in young people. For example, religious participation alone may provide only modest protection, but when combined with sports participation and involvement in civic activities, resiliency factors may significantly decrease the likelihood that an adolescent will use alcohol or other drugs.

There are, however, potential drawbacks to using resiliency research. Wolkow and Ferguson (2001) note that current research is largely correlational and consequently, causation cannot be inferred. However, there have been a few efforts at measuring the effects of encouraging resilience activities on AOD use in adolescents, notably the development of a program to encourage positive use of leisure time described by
Caldwell, Baldwin, Walls, and Smither (2004). Another was an intervention developed by Werch et al. (2003) that demonstrated that encouraging exercise and sports participation, as well as positive nutrition and sleep habits, was effective in reducing alcohol use in eighth graders in Florida. Similarly, Garrahan (2001) described a school-based systems approach that was shown to reduce adolescent use of tobacco and marijuana by encouraging both students and educators to increase positive health habits.

Research testing the efficacy of resilience factors in preventing adolescent AOD would appear to be in its infancy. Additionally, Wolkow and Ferguson (2001) note that there is currently a lack of consensus regarding the definition of resiliency, as well as factors that may contribute to it, possibly due to the relatively recent development of the concept. Finally, any qualitative research on the topic may be hampered by the unreliability of “subjective and retrospective accounts” (Wolkow and Ferguson, p. 492). Bogenschneider (1996) further noted that it may be difficult to convince parents and community members to encourage resiliency factors in young people because people tend to be much more reactive to addressing risk factors.

2.4 Individual resiliency processes

A great number of individual resiliency factors and processes, as well as their proposed interactions, have been described in the literature. The first part of this section begins with a summary of Meschke and Patterson’s (2003) thorough review of current resilience theory and literature. Readers desiring further detail on specific resilience topics and further literature are encouraged to read their article.

The second part of this section will examine the five specific social resiliency factors of interest to this study: sports and athletic activities, arts and civic activities,
religious participation, volunteering and community activities, and participation in alcohol and drug prevention programs.

2.4.1 Overview

Meschke and Patterson (2003) noted that many factors can be viewed as either risk or resiliency factors, depending on their quality, while others are strictly either positive or negative influences on adolescent AOD. They described three interactive systems that affect adolescent AOD use from an “ecosystems perspective” (p. 485) and categorized resiliency factors within this framework.

Meschke and Patterson (2003) called the first group of resiliency factors microsystems. Microsystems come into direct contact with adolescents and directly affect their behavior and psychological health. The most influential microsystem is the family. There are a number of family factors including parental or caregiver substance use/abuse, the quality of marital relationship, parenting style, the quality of the bond and communication between parent and child, parental monitoring, and parental values, especially toward substance use. The adolescent’s perception of family functioning also falls within the family microsystems. The influence of peers was also identified as a direct influence although this has been found to be a weaker source of protection against adolescent substance use than was anticipated. However, the quality of a youth’s relationship with peers is positively correlated with substance avoidance.

Additional microsystems such as schools, religious organizations, and workplaces also interact directly with young people. Positive role modeling and mentoring by other adults, such as teachers, coaches, religious leaders, and work supervisors, can be strong positive influences on young people who may be at risk due to negative microsystem influences, such as parental absence, conflict, or substance abuse. Schools, churches, and
other community organizations that come into direct contact with adolescents may also encourage resilience more overtly through AOD prevention programs.

In schools, student autonomy, connectedness, and sense of community are important. Involvement in sports and extracurricular activities has also been shown to be protective against AOD use.

Meschke and Patterson (2003) referred to the second set of factors as the mesosystem. Mesosystems involve factors that have indirect contact with adolescents. Although not involved directly with the young person, mesosystems may have a discernable impact. For example, although an adolescent may not have direct contact with a parent’s workplace, conditions of the parent’s employment, such as excessive travel or work related stress, may affect the parent’s mood and indirectly influence the child’s mood and behavior. Likewise, the political atmosphere and individual relationships between personnel in schools can have an indirect influence on the well-being of young people.

Finally, macrosystems affect everyone. Examples are social and cultural attitudes toward AOD use, as well as local social, political, and economic conditions. Meschke and Patterson (2003) note that macrosystems tend to influence microsystems directly. For example, discrimination in a community affects the availability of jobs, which would likely contribute to family conflict, poverty, divorce, etc., and thus indirectly affect adolescent AOD use. Additionally, social and cultural norms toward substance use affect the availability of alcohol and drugs for both adults and adolescents, as well as the enforcement of associated laws in neighborhoods or communities as a whole.

Goldstein and Brooks (2005) presented another framework with which to understand resiliency. They described resiliency as a biopsychosocial process of “positive
adaptation” (p. 11) that develops in young people over time. In this view, resilience is considered to be a component of wellness, rather than merely absence of pathology. Three types of resiliency factors were described. These factors actively interact to produce the attitudes and behavior of adolescents. The first, “dispositional attributes” (p. 9), includes the temperament and biology of the individual. The second identified factor is “socialization practices within the family.” This may include parental and extended family values that influence a child’s self-concept and view of others. Lastly, Goldstein and Brooks identified that “external support systems in the neighborhood and community” (p. 9) reinforce positive self-concept and confidence. These support systems serve to develop social resiliency that encourages adolescent to avoid AOD use. This researcher will examine several social resiliency factors that may predict adolescent AOD abstinence.

2.4.2 Social Resiliency Factors of Interest in This Study

The social resiliency factors examined in this study are presented in the order in which they appear in the 2006 A.D.A.S. Student Survey (Piazza & Ivoska, 2007). Their order does not have any basis in research nor does their order reflect any theoretical structure.

2.4.2.1 Sports and athletic activities.

Of the categories of resiliency factors to be examined in this study, sports and other athletic activities have garnered the most attention. Wilbert (1998) noted that since at least the 1970s, physical activity has been promoted as a “deterrent to deviant behavior” (p. 162), including AOD use, in young people. It has been theorized that adolescents who participate in sports and regularly engage in exercise have less time available to engage in AOD use (Pate et al., 1996). Leonard (1998) theorized that
adolescents who participate in organized sports are “subject to training rules and regulations” (p. 163) that encourage social conformity and healthy behavior, rather than deviance. Hence, such young people are assumed to embrace the values inherent in school and other organized sports programs and eschew prohibited behaviors.

However, the research regarding the association between physical activities, especially participation in organized school sports, is mixed. For males, participation in team sports appears to be protective against use of tobacco, but actually a risk factor for alcohol (Pate et al., 1996). This may be due to other social and/or cultural norms related to sports, including its relationship with alcohol use, particularly beer. In a study that used data from the 1990 YRBSS, Pate, et al. found that young people who reported they had exercised strenuously (as defined by increased perceived heart and breathing rate) 6 of the past 14 days were significantly less likely to have used tobacco or marijuana in the past 30 days. The authors found that in regard to alcohol, however, exercise and sports participation were correlated with decreased alcohol use for females only. Leonard (1999) performed a similar study using 1991 MTF data. He also found that sports and athletic activity were correlated with decreased use of tobacco and marijuana for both sexes, but less so with alcohol, especially for males. Similar findings were reported by Harrison and Narayan (2003) and Moore and Werch (2005). Additionally, Moore and Werch found that adolescent males who participated in high school football were especially at risk for heavy alcohol use. Interestingly, one survey of Massachusetts high school adolescents found no statistical difference between athletes and non-athletes in use of alcohol or marijuana (Naylor, Gardner, & Zaichkowsky, 2001). However, the authors did find that young people who participated in sports were less likely to use tobacco.
Leonard (1998) theorized that the findings that sports and organized athletic activities are not protective against AOD use for males is due to a disconnect between the “official position” (p. 162) of sports organizers and governing bodies against AOD use versus the “insider” (p. 162), or participants’, beliefs regarding AOD use. He noted that in professional sports, steroid use and doping are universally prohibited. As recent news stories suggest, however, these practices are not uncommon among athletes and even sometimes encouraged by coaches and trainers (Naylor et al., 2001).

Leonard (1998) also noted that males are more likely to “express their masculine role identity through athletics” (p. 163). As Werch et al. (2003) noted, social cognitive theory suggests that young people may be influenced by the association of sports and sports figures with AOD use or non-use. Young males, therefore, may be less interested in the health benefits of exercise and more in identifying with the life styles of sports role models, as well as the “culture” of specific sports, in which AOD use appears to be common (Naylor et al., 2001, p. 629). Given the number of beer commercials during televised professional football games, it is interesting that participation in high school athletic programs, of which football is arguably the most popular, does not appear to convey protection against adolescent alcohol use.

2.4.2.2 Religious participation.

Participation in religious activities has also been widely hypothesized to be prohibitive of adolescent AOD (Benda et al., 2006; Cardenas, & Montoya, 2001; Francis, 1997; Heath et al., 1999; Hodge et al, 2001; Nonnemaker et al., 2003). Like sports and exercise, common sense would appear to suggest that young people who are involved in religious activities would be less likely to engage in AOD use. Young people who participate in religious activities are thought to have less time to engage in AOD,
internalize values prohibitive of excessive AOD use, and associate with peer groups who also share these values.

The research on this factor, however, is again mixed. Francis (1997) reported that there has been a great deal of research supporting the correlation between religiosity and alcohol use in adults, noting that differences were evident between denominations, frequency of church attendance, and level of commitment. The author extended this research to adolescents, surveying 11,173 young people aged 13 through 15 in England and Wales regarding their religious participation, practices, beliefs, and AOD use. Results indicated that a belief in God, regardless of church attendance or frequency of prayer, was correlated with decreased AOD use. This was true for all denominations, although more prominent in those who identified themselves as Protestant. This later finding was supported by Heath et al. (1999) who found that Protestant affiliation, especially in African Americans, was correlated with decreased AOD use in adolescent female twin pairs regardless of socio-economic and other environmental factors.

Hodge et al. (2001) investigated how religious participation and spirituality influenced AOD use in rural adolescents. Spirituality was defined as “an experiential relationship with God” while religion was defined as “a formal set of rituals, beliefs, and practices” (p. 154). Religion and spirituality can exist either together or separately. They are also hypothesized to influence AOD use in different ways. Religious participation may provide protection through positive peer associations, although may be a manifestation of parental beliefs more that of the adolescent’s. Hodge et al. theorized that spirituality more strongly protected against AOD use by fostering positive self-image, self-confidence, and resistance to peer pressure. The authors conducted a school-based survey of a random sample of adolescents in grades 7 through 12 in rural Northern New
Mexico. The sample was 84.0 percent Hispanic, 4.0 percent non-Hispanic white, and 0.5 percent African American. Survey questions included spiritual beliefs, religious practices, and AOD use, including frequency. Results indicated no differences in AOD use between ethnicities. Spirituality was correlated with decreased AOD use of all kinds, while religious practice was correlated with decreased alcohol use only. Similarly, in their analysis of data from the 1997 National Longitudinal study of Adolescent Health, Nonnemaker et al. (2003) found that in adolescents in grades 7 through 12, “private religiosity” (p. 2049), which they defined as frequency of prayer and importance of beliefs, was more protective against AOD use than religious participation only.

2.4.2.3 Arts and civic activities.

Compared to sports and religious activities and involvement, there are fewer studies that examine the protective value of arts and civic activities against adolescent AOD use. The authors of studies reviewed, however, all hypothesized that participation in arts and civic activities, as well as volunteering and community activities, may protect adolescents from AOD use in several ways. First, adolescents who participate in arts and civic activities may be less likely to use AOD because they have less time available to do so (Duncan et al., 2002; Eccles & Barber, 1999). As Eccles and Barber noted, “idle time is the devil’s playground,” therefore, young people are less likely to engage in problematic behavior if they have less unstructured time. Secondly, arts and civic activities are generally supervised by adults. Adolescents may benefit not only from being monitored by adults, but also from possible mentoring relationships they may build with activity supervisors. Additionally, civic activities in particular are likely to be considered “prosocial” (Duncan et al., 2002, p. 429) or beneficial to the community. This
may be thought of as protective in that young people who participate in them are likely to absorb positive values inconsistent with AOD use.

It is possible that groups are self-selecting, however, in that adolescents who already share values that prohibit AOD use are more likely to choose to participate in prosocial activities than those who do not. In other words, adolescents that do not use AOD may have been significantly different before they had the opportunity to choose to involve themselves with civic activities that account for differences in AOD use. Barber, Eccles, and Stone (2001) conducted an interesting study that looked at how social group identification in high school influenced choice of activities. They defined social categories based on those in the 1985 movie *The Breakfast Club*, i.e., “the Princess, the Jock, the Brain, the Basket Case, or the Criminal” (p. 432) and noted that young people typically engage in AOD use in a manner similar to their peers. Therefore, social factors, as well as individual choices of activities, may have an influence on adolescent AOD use.

Examination of individual arts and civic activities is difficult as researchers have both defined and grouped them in varying ways, confounding efforts to make comparisons. For example, Duncan et al. (2002) grouped debate teams and ethnic cultural clubs with drama activities, music lessons, and arts and crafts into a category they termed “organized nonsports activities” (p. 429). Eccles and Barber (2002), on the other hand, separate similar activities into “academic clubs” (p. 14) that include debate, chess clubs, etc., and “performance activities” (p. 14) that encompass school band, drama, and dance.

A number of common patterns, however, can be discerned. In a longitudinal survey study following southeast Michigan students from 6th grade through to the 10th to 12th grades, Eccles and Barber (2002) found that males who participated in performance activities were less likely to use alcohol than those who did not, but for females there
appeared to be no correlation. Additionally, the connection between male performance activities and decreased AOD use was strongest in the sixth grade, but much less so for the same participants by the time they reached the 12th grade. Duncan et al. (2002) found no relationship between adolescent AOD use and the organized nonsports activities category, although they did acknowledge that the number and diversity of activities included in this area may have been a contributing factor. Barber et al. (2001), whose performance arts category contained only band, drama, and dance, found that adolescents who participated in these activities reported more alcohol and marijuana use than those who did not. This was especially true for females. The authors noted that this group of adolescents was most likely to identify themselves as Basket Cases (based on *the Breakfast Club*) and to also report symptoms suggestive of anxiety or depression.

2.4.2.4 Volunteering and community activities.

Volunteering and participating in community activities, such as scouting and YMCA programming, has also been proposed to be protective against adolescent AOD use. As discussed above, adolescents who participate in these activities may be less likely to use AOD because they have less time to do so and are supervised by adults. As discussed in the previous section, multiple methods of categorization of activities confound efforts to analyze results and make comparisons between studies. Eccles and Barber (2002) found that young people who participated in “prosocial activities” (p. 14), a category that combined religious activities with volunteering and community service, were less likely to drink alcohol and use marijuana than those who did not. Interestingly, adolescents who engaged in prosocial activities in the sixth grade were less likely to engage in AOD use in the 12th, a phenomenon not observed in the authors’ examination of the performance activities category. Fredericks and Eccles (2006a) looked at
community activities, but again, they grouped community activities such as boy or girl scouts, 4-H, junior achievement, and athletic clubs with school band, volunteering, and religious groups into one category they termed “organized activities outside of school” (p. 135). However, in their longitudinal study of elementary and high school students in southeast Michigan, they found that adolescents who did participate in activities outside of school used less alcohol than those who reported they did not. In a separate study of Maryland youth, Fredericks and Eccles (2006b) found no correlation between AOD use in young people who participated in prosocial activities, as defined by volunteering and involvement in political action groups. Barber et al. (2001) did find that adolescents who participated in prosocial activities (the Brains in their group based on the Breakfast Club) reported less AOD use, although their category included religious group participation.

2.4.2.5 Participation in alcohol and drug prevention programs.

Schools and communities approach adolescent AOD prevention programming in two ways (VanderWaal et al, 2005). Community based approaches have involved activities such as limiting the availability of AOD to young people, providing supervised after school activities, and public service advertisements on radio and television. Primary prevention programs aimed directly at adolescents, particularity in schools, have been increasingly used since the 1960s and 1970s (Donaldson et al., 1996). Many early programs failed, however, due to faulty theory regarding what approaches would be effective in deterring adolescent AOD use (Donaldson et al.). For example, early efforts to “scare” (p. 869) young people regarding the effects of AOD and to provide information about the effects of substances, as well as drug paraphernalia, was found to either have no effect or to increase AOD use. Similarly, efforts to “plead to adolescent
morality” (p. 869), or to boost self-esteem and influence personality development, were also found to be ineffective.

Donaldson et al. (1996) noted that by the 1980s, “social influences” (p. 869) were believed to be the most important reason young people used AOD and programming based on this theory was developed. Hanson, Busenbury, Bishop, and Derzon (2007) conducted an analysis of 48 manualized AOD programs from the 2003 SAMHSA National Registry of Effective Programs and Practices that were aimed at young people. The authors reported that the programs evaluated were frequently vague regarding theoretical underpinnings, but were generally based on Social Learning Theory, the Theory of Reasoned Action, and Social Control Theory. The authors also classified content into five prevention strategies: (a) attitudes about AOD, (b) beliefs regarding consequences of use, (c) commitment to non-use, (d) beliefs about the acceptability of AOD use, and (e) congruence of values regarding AOD and life goals.

Donaldson et al. (1996) divided what they termed “social influences curriculum” (p. 870) into three general categories. The first provided basic information regarding AOD use, including physical consequences, and encouraged involvement in the program. The authors referred to the second category as “normative social-influences-oriented lessons” (p. 870) which presented social norms regarding AOD use, as well as instruction and practice of “assertion refusal” (p. 870) skills. Assertion refusal skills gained attention in the 1980s during First Lady Nancy Reagan’s “Just Say No” campaign. The last category, “informational social influences-oriented lessons” (p. 870), presented accurate information regarding the prevalence of AOD use, examined media influences, and encouraged social activism against AOD use. Donaldson et al. noted that not all programs incorporated aspects from all three categories and that program developers tended to
chose those they thought should work, rather than those empirically shown to be effective.

There is a great number of individual AOD prevention programs aimed at young people. A review of the content and effectiveness of all available programming is outside the scope of this paper. For further information the reader is referred to Preventing Drug Abuse Among Children and Adolescents: A Research Based Guide for Parents, Educators, and Community Leaders (National Institute on Drug Abuse, 2003) for a review of the most widely used programs including the Life Skills Training Program, Project ALERT, and Project STAR. As noted by Donaldson et al. (1996), programs vary regarding the type of substance use targeted and program components used, making comparisons of effectiveness difficult. Additionally, Gorman and Conde (2007) noted that program evaluations are usually conducted by the individuals or groups that developed and/or distributed the program, indicating a conflict of interest and making evaluation results suspect. However, several researchers have concluded that the most effective programs combine primary programs with community measures and actively involve students in program activities rather than being strictly didactic (Donaldson et al., 1996; Hansen et al., 2007; Hawkins et al, 1992; VanderWaal et al, 2005).

2.5 Summary

Adolescent AOD use continues to be a serious social problem in the United States (Chen et al., 2004) and is a contributing factor in multiple health, family, and social problems experienced by young people as well a society as a whole. Research into adolescent AOD use has frequently focused on measuring and monitoring the problem, as well as identifying individual and environmental factors that put young people at risk of initiating AOD use. Large scale studies in this area include the MTF project (Johnson et
al., 2007), the YRBSS survey by the CDC, and SAMHSA’s *National Survey on Drug Use and Health.*

Hawkins et al. (1992) described risk factors as “precursors” (p. 65) that may influence adolescents to engage in AOD use. The authors described two broad categories of risk factors. The first, termed socio-cultural factors, include poverty, population density, crime rates, local AOD laws, and commitment of law enforcement to enforce those laws. The second category, individual/interpersonal factors, includes biochemical influences, impulse control, conflicts with family and peers, and individual tendencies to self medicate with AOD to alter negative emotional states. Drawbacks to exclusive use of the risk factor approach are that it tends to focus on young people already using AOD rather than those that have avoided doing so, stigmatizes disadvantaged populations, and makes empirical research in the area difficult (Hawkins et al., 1999; Meschke & Patterson, 2003; Wolkow & Ferguson, 2001).

The resiliency approach aims to provide insight into why many adolescents, despite exposure to multiple risk-factors, abstain from substances. Additionally, using the resiliency approach may help prevent substance abuse by identifying and promoting factors that influence adolescents to abstain. This approach has several advantages including simultaneous consideration of both risk and protective factors, examination of how multiple systems interact to affect young people, efficacy in proactively preventing AOD use in adolescent vs. addressing problems after they have been initiated.

Wolkow and Ferguson (2001) identified several potential drawbacks to the resiliency approach including the current lack of empirical support for the concept and potential difficulty in persuading parents, as well as school and community leaders, to change established ways of looking at adolescent AOD use. Despite these drawbacks, the
resiliency approach show promise in developing an alternative way of addressing the problem of adolescent AOD use.

Multiple specific potential resiliency factors have been identified (Meschke and Patterson, 2003). Six of these specific factors will be examined in this study. The first is sports and athletic activities. Research in this area is mixed but appears to show that sports and athletic participation is less protective against alcohol use than other substances, especially among males. The second factor to be examined is religious participation which may offer protection through internalization or values rather than solely through participation. The third and fourth factors to be examined are arts and civic activities and volunteering and community activities. Both were found to be a defined broadly and inconsistently. Consequently, there appeared to be little consensus as to whether either were protective. However, as Eccles and Barber (1999) noted, adolescents who participate in these endeavors are generally supervise and participants maybe be self-selecting in that they identify prosocial values prior to participation.

Finally, alcohol and drug prevention programs are examined. Social influences were found to be a major reason adolescents engage in AOD use (Donaldson et al, 1996). Although most programs claim some success, there is great variation in program content. However, prevention programs that involved active participation adolescents were found to be more beneficial than those that employed a lecture format only.
Chapter Three

Method

3.1 Overview

The researcher used SPSS to perform a 2 x 2 Chi square analyses examining whether participation in social resiliency activities was correlated with abstinence from cigarettes, alcohol, and marijuana more than would be predicted by chance. The analyses were performed for the entire sample, then for males and females separately. When findings were significant, post hoc analyses of residuals and Relative Risk Ratios were computed.

This was a retrospective study that examined data from the 2006 Lucas County (Ohio) Alcohol and Drug Addiction Services (ADAS) Board Youth Alcohol & Other Drug Use Survey, commonly referred to as the 2006 ADAS Student Survey (Piazza & Ivoska, 2007). The specific substances examined included alcohol, tobacco, and marijuana. Analysis was restricted to these three substances as previous survey research using adolescents, including the Monitoring the Future survey (Johnson et al., 2007), the Centers for Disease Control Youth Risk Behavior Surveillance System survey (2005), and the Substance Abuse and Mental Health Services Administration National Survey on Drug Use and Health (2005), have revealed that use of other substances, such as
amphetamines and cocaine, is relatively infrequent compared to alcohol, tobacco, and marijuana. Social resiliency factors examined were sports and athletic activities, religious participation, arts and civic activities, volunteering and community activities, and participation in alcohol and drug prevention programs.

The data examined was collected using the 2006 ADAS Student Survey (Piazza & Ivoska, 2007). Participants were students in grades 10 through 12 attending all public and parochial schools in Lucas County, Ohio, who were present the day the survey was administered. The study was limited to grades 10 through 12 in order to determine if adolescents who report abstaining from AOD use were more likely to participate in the identified social resiliency activities than respondents who report alcohol, tobacco, or marijuana use. Although adolescents frequently first experiment with AOD use in grades 8 or 9, many do not continue to use beyond these grades (Hawkins et al., 1992).

3.2 Variables

The independent variables examined were participation in sports or athletic activities, arts or civic activities, religious activities, volunteering or community activities, or alcohol and drug prevention clubs, as well as gender and grade level. Participation in social resiliency activities were measured by responses to questions 67, 68, 69, 70, and 71 of the 2006 ADAS Student Survey (see Appendix A) for each activity respectively. Question 2 addressed gender and question 3 addressed grade level.

Participation in each social resiliency activity was operationally defined as endorsing either B (1-2 times per month), C (1-2 times per week, or D (Almost daily) for each activity. Endorsing choice A (never) was defined as not participating in the activity specific to that question.
The dependent variables examined in this study were tobacco, alcohol, and marijuana use. Abstinence or use was determined by answers to survey questions 7, 13, and 16 which addressed use of these substances in the past 30 days (see Appendix A). The decision to use these questions was based on research that indicates asking individuals about past 30 day use, as opposed to lifetime or past year use, is a more reliable indicator of actual use primarily due to the inaccuracy of memory (McLellan et al., 2006). This phenomenon appears to be especially true of adolescents (Meyers et al., 1995).

Tobacco use was defined as endorsing any option other than A (Not at all) to question 7 on the survey. Alcohol use was defined as endorsing any option other than A (Never) to question 13. Marijuana use was defined as endorsing any option other than A (Never) to question 16. Abstinence from each substance was defined as endorsing option A to questions 7, 13, or 16.

3.3 Participants

The population sampled in this study was students in grades 10 through 12 attending all public and parochial schools in Lucas County who completed the Lucas County Alcohol and Drug Addiction Services (ADAS) Board survey in 2006 (n=11,405). Females comprised 49.9 percent, males 49.4 percent, and .7 percent of participants did not respond to the question regarding gender. Participants included all students in public, private, and charter schools during the 2005-2006 school year in Lucas County, which encompasses urban, suburban, and rural areas. Data were not collected from home schooled students or those who had either dropped out of school or were not present the day the survey was administered. Data from any participant who endorsed use of cozmazine (item 29, Appendix A), a fake substance included in the survey to aid in
identification of over-reporting, were excluded from the data set, as were any surveys that were less than 75 percent complete or which were unreadable by the scanning equipment. The number of surveys that were excluded for either unreadability or endorsement of the fake substance was unknown to the researcher.

3.4 Sample

The data set used in this study comprised population data for all surveyed students in grades 10 through 12 in 2006 in Lucas County, Ohio. Therefore, analysis of the entire data set would have been inappropriate because of the possibility that even very small effect sizes would be found to be statistically, although perhaps not clinically, significant (Heppner, Kivlighan, & Wampold, 1999). Therefore, SPSS was utilized to draw a random sample of 1,200 participants from the population data. Through examination of the data, a sample size of 1,200 was found to be sufficient to avoid findings of frequencies of less than 5 in any cell in the Chi square analyses as such a situation would distort results (Gravetter & Wallnau, 2000). The sample was proportionally stratified in order to be representative of the population as a whole in terms of gender and grade level.

3.5 Instrumentation

The 2006 ADAS Student Survey was the instrument used in this study. The survey was originally created by the Lucas County ADAS Board in 1988 to measure frequency of substance use among adolescents in Lucas County. It has subsequently been administered bi-annually in order to determine changing patterns and trends. The Board based many of the questions in the survey on the Monitoring the Future survey (Johnston et al., 2006) in order to facilitate comparison of data from both surveys (Piazza & Ivoska, 2007). Information from the ADAS Board surveys is also used in substance use prevention and education, as well as to make revisions in subsequent surveys.
The 2006 ADAS Student Survey (Appendix A) is four pages long and consists of 71 questions that gather demographic information including age, gender, grade level, ethnicity, school, zip code, height, and weight, as well as epidemiological information regarding AOD use. Additionally, questions address substance use frequency and attitudes, environmental risk factors, risky and aggressive behaviors, as well as in-school and extracurricular activities. Although information regarding grade level and school building was obtained for each participant, no identifying information, including name or classroom number, was collected.

There is no current information regarding the reliability and validity of the 2006 ADAS Student Survey (W.J. Ivoska, personal communication, October, 2008). The reliability of the survey was assessed by the current researcher using Cronbach’s Alpha test for internal consistency. Unfortunately, the researcher was not able to conduct a separate concurrent validity analysis with other similar surveys. It is valuable to note, however, that content validity was established by having experts in the AOD prevention field review items before publication of the survey (N. J. Piazza, personal communication, November, 2008).

As noted by Abbet, Rehm, and Spinatsch (1994) the external, or criterion, validity of AOD use surveys can be assessed through corroborating sources of information obtained from outside the survey. Examples include blood, urine, or hair analysis of survey participants to confirm AOD use or non-use, interviews with family, friends, or other informants regarding participants’ AOD use behavior, or examination of participants’ medical records. None of these procedures could be used to validate the 2006 ADAS Student Survey retrospectively.
Ascertaining construct validity of an AOD survey with certainty is difficult, however, it can be estimated through a number of means (Swadi, 1990). As an epidemiological study, the 2006 ADAS Student Survey has a great deal of face validity, that is, the questions are straightforward requests for information regarding frequency of AOD use and other behaviors. Additionally, construct validity can be examined by comparing responses to questions regarding AOD use to those theoretically correlated with AOD use (Abbet et al., 1994; Swadi ). The authors of the Lucas County ADAS Board Special Report of the 2006 Youth Alcohol & Other Drug Use Survey (Piazza & Ivoska, 2007) claimed that participants who reported using AOD were more likely to respond positively to survey questions regarding attending school while under the influence of AOD, operating a vehicle while using AOD, or riding in a car with a driver who had used AOD. All are risk factors for increased AOD use as identified by Hawkins et al. (1992).

Additionally, Piazza and Ivoska (2007) reported several other measures that were taken to minimize risks to internal validity in the ADAS Student Survey. First, a question regarding use of a fake drug was included in the survey in an effort to detect inaccurate reporting and response errors. All surveys in which the participant indicated use of this fake substance were deleted from the data set. Also deleted were surveys from respondents that reported use of the maximum amount of all drugs, as well as those that gave inconsistent responses, such as reporting use in the past month but not in the past year. Additionally, the survey was administered in a confidential manner using self-administered answer sheets, rather than interviews, which has been shown to increase the accuracy of self report in AOD use surveys (Harrison, 1995; Johnston et al., 2007). Given
the above information, the researcher judged that it was likely that the 2006 ADAS Student Survey was adequately valid.

3.6 Procedures

After the survey was created and approved by the ADAS Board, the Community Partnership, a local non-profit agency in Lucas County, Ohio, directed the printing and packaging of the survey forms. Forms were then shipped to superintendents of participating school systems, who distributed them to designated coordinators in each participating school building in their districts. Parental permission was obtained during pre-registration prior to each school year. Adolescents whose parents refused permission, or those students who declined to participate in the survey, were excused from participation without penalty.

The survey was administered to all adolescents in Lucas County on approximately the same day and at the same time. Homeroom teachers, who had previously received the survey forms from district coordinators, administered the survey to students present in class that day. Teachers informed students that participation was voluntary and no penalty would be incurred by those who chose not to complete the survey. Any students who declined, or those who did not have parental permission, were excused and given a study period.

Teachers then read survey instructions to the participants and allowed them to complete the response form. Teachers placed completed response forms in a sealed envelope and returned them to the district coordinators, who in turn returned them to Community Partnership personnel.

Qualified Community Partnership employees reviewed collected survey response forms, discarding those that were less than 75 percent complete or which were
unreadable. The remaining response forms were then transported to Owens Community College in Oregon, Ohio, where they were electronically scanned and tabulated by qualified personnel. The resulting data were then compiled and analyzed by William Ivoska, Ph.D. A summary report was then written and presented to the Lucas County ADAS Board.

3.7 Statistical hypotheses

The following hypotheses were tested in order to determine if the identified resiliency factors were correlated with decreased use of alcohol, tobacco, and marijuana in males, females, and the population as a whole.

Research Question 1. Does participation in sports or athletic activities by students in grades 10 through 12 in Lucas County, Ohio, predict abstinence from use of tobacco, alcohol, or marijuana?

Research Hypothesis 1.A.1: Participation in sports and athletic activities will predict abstinence from use of alcohol for all participants.

Research Hypothesis 1.A.2: Participation in sports and athletic activities will predict abstinence from use of alcohol for male participants.

Research Hypothesis 1.A.3: Participation in sports and athletic activities will predict abstinence from use of alcohol for female participants.

Research Hypothesis 1.B.1: Participation in sports and athletic activities will predict abstinence from use of tobacco for all participants.

Research Hypothesis 1.B.2: Participation in sports and athletic activities will predict abstinence from use of tobacco for male participants.

Research Hypothesis 1.B.3: Participation in sports and athletic activities will predict abstinence from use of tobacco for female participants.
Research Hypothesis 1.C.1: Participation in sports and athletic activities will predict abstinence from use of marijuana for all participants.

Research Hypothesis 1.C.2: Participation in sports and athletic activities will predict abstinence from use of marijuana for male participants.

Research Hypothesis 1.C.3: Participation in sports and athletic activities will predict abstinence from use of marijuana for female participants at any grade level.

Research Question 2. Is participation in arts or civic activities by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of tobacco, alcohol, or marijuana?

Research Hypothesis 2.A.1: Participation in arts and civic activities will predict abstinence from the use of tobacco for all participants.

Research Hypothesis 2.A.2: Participation in arts and civic activities will predict abstinence from the use of tobacco for male participants.

Research Hypothesis 2.A.3: Participation in arts and civic activities will predict abstinence from the use of tobacco for female participants.

Research Hypothesis 2.B.1: Participation in arts and civic activities will predict abstinence from the use of alcohol for all participants.

Research Hypothesis 2.B.2: Participation in arts and civic activities will predict abstinence from the use of alcohol for male participants.

Research Hypothesis 2.B.3: Participation in arts and civic activities will predict abstinence from the use of alcohol for female participants.

Research Hypothesis 2.C.1: Participation in arts and civic activities will predict abstinence from the use of marijuana for all participants.
Research Hypothesis 2.C.2: Participation in arts and civic activities will predict abstinence from the use of marijuana for male participants.

Research Hypothesis 2.C.3: Participation in arts and civic activities will predict abstinence from the use of marijuana for female participants.

Research Question 3. Is participation in religious activities by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of tobacco, alcohol, or marijuana?

Research Hypothesis 3.A.1: Participation in religious activities will predict abstinence from the use of tobacco for all participants.

Research Hypothesis 3.A.2: Participation in religious activities will predict abstinence from the use of tobacco for male participants.

Research Hypothesis 3.A.3: Participation in religious activities will predict abstinence from the use of tobacco for female participants.

Research Hypothesis 3.B.1: Participation in religious activities will predict abstinence from the use of alcohol for all participants.

Research Hypothesis 3.B.2: Participation in religious activities will predict abstinence from the use of alcohol for male participants.

Research Hypothesis 3.B.3: Participation in religious activities will predict abstinence from the use of alcohol for female participants.

Research Hypothesis 3.C.1: Participation in religious activities will predict abstinence from the use of marijuana for all participants.

Research Hypothesis 3.C.2: Participation in religious activities will predict abstinence from the use of marijuana for male participants.
Research Hypothesis 3.C.3: Participation in religious activities will predict abstinence from the use of marijuana for female participants.

Research Question 4. Is participation in volunteering or community activities by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of tobacco, alcohol, or marijuana?

Research Hypothesis 4.A.1: Participation in volunteering and community activities will predict abstinence from the use of tobacco for all participants.

Research Hypothesis 4.A.2: Participation in volunteering and community activities will predict abstinence from the use of tobacco for male participants.

Research Hypothesis 4.A.3: Participation in volunteering and community activities will predict abstinence from the use of tobacco for female participants.

Research Hypothesis 4.B.1: Participation in volunteering and community activities will predict abstinence from the use of alcohol for all participants.

Research Hypothesis 4.B.2: Participation in volunteering and community activities will predict abstinence from the use of alcohol for male participants.

Research Hypothesis 4.B.3: Participation in volunteering and community activities will predict abstinence from the use of alcohol for female participants.

Research Hypothesis 4.C.1: Participation in volunteering and community activities will predict abstinence from the use of marijuana for all participants.

Research Hypothesis 4.C.2: Participation in volunteering and community activities will predict abstinence from the use of marijuana for male participants.

Research Hypothesis 4.C.3: Participation in volunteering and community activities will predict abstinence from the use of marijuana for female participants.
Research Question 5. Is participation in alcohol and drug prevention clubs by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of tobacco, alcohol, or marijuana?

Research Hypothesis 5.A.1: Participation in alcohol and drug prevention will predict abstinence from the use of tobacco for all participants.

Research Hypothesis 5.A.2: Participation in alcohol and drug prevention will predict abstinence from the use of tobacco for male participants.

Research Hypothesis 5.A.3: Participation in alcohol and drug prevention will predict abstinence from the use of tobacco for female participants.

Research Hypothesis 5.B.1: Participation in alcohol and drug prevention will predict abstinence from the use of alcohol for all participants.

Research Hypothesis 5.B.2: Participation in alcohol and drug prevention will predict abstinence from the use of alcohol for male participants.

Research Hypothesis 5.B.3: Participation in alcohol and drug prevention will predict abstinence from the use of alcohol for female participants.

Research Hypothesis 5.C.1: Participation in alcohol and drug prevention will predict abstinence from the use of marijuana for all participants.

Research Hypothesis 5.C.2: Participation in alcohol and drug prevention will predict abstinence from the use of marijuana for male participants.

Research Hypothesis 5.C.3: Participation in alcohol and drug prevention will predict abstinence from the use of marijuana for female participants.

3.8 Statistical Analysis

A 2 x 2 Chi square analysis, utilizing SPSS software, was used to test all hypotheses in this study. The Chi square was selected due to the categorical and
dichotomous nature of the dependent variable to be examined (i.e., AOD use vs. AOD abstinence.) The Chi square procedure is used to determine if observed frequencies of the dependent variable differ from what would be expected by chance. It is suited for use with categorical data where employing a parametric test would be inappropriate (Hinkle, Wiersma, & Jurs, 2003) and is, therefore, appropriate for use with these data.

Chi square analyses were performed for the sample as a whole, then for males and females separately, for each combination of dependent and independent variable resulting in 45 individual analyses. The significance level was set at $p \leq .05$. However, when a large number of analyses are performed using the same data set, the chance that significant results will be found increases, effectively inflating the alpha level (Abdi, 2007). The Bonferroni correction ($p/n$, where $n =$ the number of analyses) can be used to reduce the alpha level and decrease the chance of Type I error (Abdi). The researcher used the Bonferroni correction and results were considered significant if $p \leq .001$. Where results were found to be significant, post hoc analyses of standardized residuals were then performed to determine which categories of independent and dependent variables contributed to positive results. Resiliency factors were considered to be associated with lower likelihood of substance use if the relative risk ratio was $< 1.00$ and the standardized residual was less than or equal to -2.00.

The relative risk ratio, which compares the probabilities of two groups, was also computed. A relative risk ratio of 1.0 indicates equal probability between groups. Relative risk ratios greater than 1.0 suggest an event or condition is more likely in the first group, while a ratio less than 1.0 indicates the condition is less likely in the first group (Simon, 2009). In this study, the first group was the respondents who reported participation in the resiliency activities. The relative risk ratio states how more likely
participating students were to be abstinent that those who did not participate in the examined resiliency activities.

2.5 Summary

A 2 x 2 Chi square analysis was utilized to examine whether participation in five social resiliency activities were correlated with abstinence from cigarettes, alcohol, and marijuana more than would be predicted by chance. The social resiliency factors examined included participation in sports or athletic activities, arts or civic activities, religious activities, volunteering or community activities, and alcohol and drug prevention clubs.

A stratified sample of 1,200 respondents from grades 10 through 12, representative of the population in terms of grade level and gender, was drawn from the data collected in the 2006 ADAS Student Survey (Piazza & Ivoska, 2007). Chi square analyses were performed for each of five research questions first for the entire sample, then for males and females separately. The procedure resulted in 45 separate analyses, therefore, the researcher used the Bonferroni correction and results were considered significant if p < .001. When findings were significant, post hoc analyses of residuals and Relative Risk Ratios were computed.

There are several sources of survey error that could have negatively affected the validity of this research. Intentional or unintentional measurement errors and concerns about confidentiality, as well as coverage and non-response errors may have been factors influencing results. Finally, the results of this study may not be generalizable to other populations due to differing socio-economic and demographic factors.
Chapter Four

Results

4.1 Overview

The author’s purpose for this study was to add to the growing body of knowledge regarding how social resiliency factors may be protective of abstinence from alcohol and other drug (AOD) use in adolescents. Specifically, data from the 2006 Lucas County (Ohio) Alcohol and Drug Addiction Services (ADAS) Board Youth Alcohol & Other Drug Use Survey (Piazza & Ivoska, 2007) were retrospectively examined to determine if five social resiliency factors were associated with abstinence from use of cigarettes, alcohol, and marijuana. The social resiliency factors examined in this study included participation in sports or athletic activities, arts or civic activities, religious activities, volunteering or community activities, and alcohol and drug prevention clubs.

The researcher used a 2 x 2 Chi square analysis to examine whether participation in social resiliency activities was correlated with abstinence from alcohol, cigarettes, and marijuana more than would be predicted by chance. The Chi square was chosen because it is suited for use with categorical data where employing a parametric test would be inappropriate (Hinkle et al., 2003).
Participants were students in grades 10 through 12 attending all public and parochial schools in Lucas County, Ohio, who were present the day the ADAS Board survey was administered. A sample of 1,200 participants, proportionally stratified in order to be representative of the population as a whole in terms of gender and grade level, was drawn from the population. Table 4-1 presents frequency data for this sample.

Table 4-1: Summary of Substance Use in Sample by Grade x Sex

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<thead>
<tr>
<th>Grade</th>
<th>Sex</th>
<th>Cigarettes</th>
<th></th>
<th></th>
<th></th>
<th>Alcohol</th>
<th></th>
<th></th>
<th></th>
<th>Marijuana</th>
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<tbody>
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<td>17.4%</td>
<td>82.6%</td>
<td>100.0%</td>
<td>53.5%</td>
<td>46.5%</td>
<td>100.0%</td>
<td>30.8%</td>
<td>69.2%</td>
<td>100.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>% Total</td>
<td>8.4%</td>
<td>39.9%</td>
<td>48.3%</td>
<td>25.8%</td>
<td>22.5%</td>
<td>48.3%</td>
<td>14.9%</td>
<td>33.4%</td>
<td>48.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>Count</td>
<td>43</td>
<td>141</td>
<td>184</td>
<td>105</td>
<td>79</td>
<td>184</td>
<td>46</td>
<td>138</td>
<td>184</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% Gender</td>
<td>23.4%</td>
<td>76.6%</td>
<td>100.0%</td>
<td>55.3%</td>
<td>49.7%</td>
<td>100.0%</td>
<td>25.0%</td>
<td>75.0%</td>
<td>100.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>% Total</td>
<td>12.1%</td>
<td>39.6%</td>
<td>51.7%</td>
<td>29.5</td>
<td>22.2%</td>
<td>51.7%</td>
<td>12.9%</td>
<td>38.8%</td>
<td>51.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Totals</td>
<td>Count</td>
<td>73</td>
<td>283</td>
<td>356</td>
<td>197</td>
<td>159</td>
<td>356</td>
<td>99</td>
<td>257</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% Gender</td>
<td>20.5%</td>
<td>79.5%</td>
<td>100.0%</td>
<td>55.3%</td>
<td>44.7%</td>
<td>100.0%</td>
<td>27.8%</td>
<td>72.2%</td>
<td>100.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>% Total</td>
<td>20.5%</td>
<td>79.5%</td>
<td>100.0%</td>
<td>55.3%</td>
<td>44.7%</td>
<td>100.0%</td>
<td>27.8%</td>
<td>72.2%</td>
<td>100.0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chi square analyses were performed for the entire sample, then for males and females separately, for each combination of dependent and independent variable. Post hoc analyses of residuals were performed for all three groups and relative risk ratios were computed for significant findings. The significance level was set at \( p \leq .05 \) and the Bonferroni correction \( (p/n, \text{ where } n = \text{ the number of analyses}) \) was used to reduce the alpha level to \( p \leq .001 \) and decrease the chance of Type I error (Abdi, 2007). Results were considered significant if at or below the .001 level of probability \( (p \leq .001) \).

Resiliency factors (independent variables) were considered to be positively associated with abstinence from the dependent variables if the standardized residual for the cell resiliency factor by substance use was less than negative two (-2.0).

4.2 Reliability Analysis

SPSS 17.0 was used to obtain Cronbach’s Alpha for the data contained in the 2006 Lucas County (Ohio) Alcohol and Drug Addiction Services (ADAS) Board Youth Alcohol & Other Drug Use Survey. The use of Cronbach’s Alpha, however, is only appropriate for use with scaled data (Helms et al., 2006). Therefore, questions that were not measured this way were eliminated from the analysis. Eliminated questions included questions 1 through 4, which request demographic data, and questions 35 through 42, which were measured dichotomously. The results are presented in Table 4-1.

| Table 4-2: Cronbach’s Alpha for the 2006 Lucas County (Ohio) Alcohol and Drug Addiction Services (ADAS) Board Youth Alcohol & Other Drug Use Survey |
|-----------------|-----------------|------------|-------|----------|----------|
| Cronbach’s Alpha | Cronbach’s Alpha Based on Standardized Items | N of Items | Mean | Variance | Std. Deviation |
| .58             | .74             | 53        | 57.17 | 147.10   | 12.13    |

Values for Cronbach’s Alpha over .60 or .70 have generally been accepted to indicate adequate reliability by various sources (Helms et al., 2006). Using this criterion, the values obtained for the 2006 Lucas County (Ohio) Alcohol and Drug Addiction
ADAS Board Youth Alcohol & Other Drug Use Survey are acceptable based on standardized items, but slightly low in general. Helms et al. noted that if an instrument is multidimensional, i.e., attempts to measure more than one construct or several aspects of a single construct, the value for Cronbach’s alpha may be low. This condition is true for the ADAS survey in that multiple questions are designed to measure behaviors other than AOD use including emotionality and exercise habits, as well as perceptions of personal safety and attitudes toward AOD use. Under these circumstances, Helms et al. recommended performing a factor analysis and then calculating Cronbach’s Alpha individually for each identified factor. This procedure, however, is outside the scope of this study. Given that the ADAS survey is multidimensional in nature, the values obtained for Cronbach’s Alpha are assumed to indicate the survey is sufficiently reliable.

4.3 Data preparation

The researcher received the survey data in SPSS data file format. The data were reduced to include only grades 10, 11, and 12. Independent variable questions 7 (cigarette use in the past 30 days), 13 (alcohol use in the last 30 days) and 15 (marijuana use in the last 30 days) were re-coded dichotomously to indicate either abstinence or use. Responses of “A. Never” were recoded as 0 and all other responses were coded as one. The values for the 5 social resiliency variables were also coded dichotomously when entered into SPSS to facilitate computation of the relative risk ratios. The independent variables were coded as “0” if respondents indicated that they had participated or as “1” if they reported that they had not participated in the activity. All cases that contained missing data for any of the dependent or independent variables were deleted in order to avoid missing data in the analyses. The number of valid cases deleted (965) was 8.5% of the total population data. Table 4-2 is a summary of deleted cases.
Table 4-3: Summary of deleted cases

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency prior to deletion</th>
<th>Number deleted</th>
<th>Frequency after deletion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade in school</td>
<td>11,405</td>
<td>0</td>
<td>10,440</td>
</tr>
<tr>
<td>Gender</td>
<td>11,275</td>
<td>130</td>
<td>10,440</td>
</tr>
<tr>
<td>Cigarette use in past 30 days</td>
<td>11,388</td>
<td>17</td>
<td>10,440</td>
</tr>
<tr>
<td>Alcohol use in past 30 days</td>
<td>11,372</td>
<td>33</td>
<td>10,440</td>
</tr>
<tr>
<td>Marijuana use in past 30 days</td>
<td>11,376</td>
<td>29</td>
<td>10,440</td>
</tr>
<tr>
<td>Frequency of athletic activity</td>
<td>10,879</td>
<td>526</td>
<td>10,440</td>
</tr>
<tr>
<td>Frequency of art-civic-theatre-etc activity</td>
<td>10,869</td>
<td>536</td>
<td>10,440</td>
</tr>
<tr>
<td>Frequency of religious activity</td>
<td>10,871</td>
<td>534</td>
<td>10,440</td>
</tr>
<tr>
<td>Frequency of volunteer activity</td>
<td>10,875</td>
<td>530</td>
<td>10,440</td>
</tr>
<tr>
<td>Frequency of in school drug prevention club</td>
<td>10,737</td>
<td>668</td>
<td>10,440</td>
</tr>
<tr>
<td>Total number deleted</td>
<td>—--</td>
<td>965</td>
<td>—--</td>
</tr>
</tbody>
</table>

4.4 Sampling and analysis procedures

As proposed in Chapter Three, a sample of 1,200 participants was drawn from the population. The sample was proportionally stratified in order to be representative of the population in regard to sex and grade level.

Chi square analyses were performed for the entire sample, then for males and females separately, for each combination of dependent and independent variable. The entire procedure resulted in 45 individual Chi square analyses. Post hoc analyses of standardized residuals and Relative Risk Ratios were computed for all three groups where Chi square results were found to be significant at the $p \leq .001$ level.
4.5 Results

4.5.1 Research Question 1: Sports and Athletic Activities

Does participation in sports or athletic activities by students in grades 10 through 12 in Lucas County, Ohio, predict abstinence from use of cigarettes, alcohol, or marijuana?

Research Hypothesis 1.A.1: Participation in sports and athletic activities will predict abstinence from use of cigarettes for all participants.

Results for all participants considered together were $\chi^2(1, N = 1,200) = 31.62, p = .000$, indicating a significant relationship between sports and abstinence from cigarettes. Table 4-4 presents the results for this group.

<table>
<thead>
<tr>
<th>Sports and Athletic Activities</th>
<th>Cigarettes R</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
<td>No Use</td>
</tr>
<tr>
<td>Participated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Count</td>
<td>107</td>
<td>741</td>
</tr>
<tr>
<td>Expected Count</td>
<td>139.9</td>
<td>708.1</td>
</tr>
<tr>
<td>Standardized Residual</td>
<td>-2.8</td>
<td>1.2</td>
</tr>
<tr>
<td>No Participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Count</td>
<td>91</td>
<td>261</td>
</tr>
<tr>
<td>Expected Count</td>
<td>58.1</td>
<td>293.9</td>
</tr>
<tr>
<td>Standardized Residual</td>
<td>4.3</td>
<td>-1.9</td>
</tr>
</tbody>
</table>

R values indicate that students who participated in sports and athletics were less likely to smoke cigarettes (-2.8) than chance alone would have predicted. The relative risk ratio for this group = .488, indicating students who participated in sports and athletics were approximately 48.8% less likely to use cigarettes than those who did not participate. Although not an anticipated finding, results also indicate that those who did not participate in sports or athletic activities were more likely to use (4.3) than chance alone would have predicted.

Research Hypothesis 1.A.2: Participation in sports and athletic activities will predict abstinence from use of cigarettes for all male participants.
Result for males were $\chi^2(1, N = 568) = 6.45, p = .011$, indicating there was not a significant relationship between sports and abstinence from cigarettes for boys in this sample.

Research Hypothesis 1.A.3: Participation in sports and athletic activities will predict abstinence from use of cigarettes for all female participants.

Results for female participants were $\chi^2(1, N = 632) = 26.95, p = .000$, indicating a significant relationship between sports and cigarettes for girls. Table 4-5 presents the results for this group.

**Table 4-5 Sports by Cigarettes – Females**

<table>
<thead>
<tr>
<th>Sports and Athletic Activities</th>
<th>Cigarettes R</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual Count</td>
<td>Used</td>
<td>No Use</td>
</tr>
<tr>
<td>Participated</td>
<td>48</td>
<td>372</td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td>71.1</td>
<td>348.9</td>
<td></td>
</tr>
<tr>
<td>Standardized Residual</td>
<td>-2.7</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>No Participation</td>
<td>59</td>
<td>153</td>
<td></td>
</tr>
<tr>
<td>Actual Count</td>
<td>35.9</td>
<td>176.1</td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td>3.9</td>
<td>-1.7</td>
<td></td>
</tr>
</tbody>
</table>

R values indicate that girls who participated in sports and athletics were less likely to smoke cigarettes (-2.7) than chance would predict. The relative risk ratio for this group = .411, indicating students who participated in sports and athletics were approximately 41.1% less likely to use cigarettes than those who did not participate. As was unexpectedly found for all participants, females who did not participate in sports and athletic activities were also more likely to use (3.9) than chance would predict.

Research Hypothesis 1.B.1: Participation in sports and athletic activities will predict abstinence from use of alcohol for all participants.
Results for all participants considered together were $\chi^2(1, N = 1,200) = .002, p = .966$, indicating that there was no significant relationship between sports and abstinence from alcohol use in this sample.

Research Hypothesis 1.B.2: Participation in sports and athletic activities will predict abstinence from use of alcohol for male participants.

Results for males were $\chi^2(1, N = 568) = 1.21, p = .272$, indicating that there was no significant relationship between sports and abstinence from alcohol use for boys in this sample.

Research Hypothesis 1.B.3: Participation in sports and athletic activities will predict abstinence from use of alcohol for female participants.

Results for females were $\chi^2(1, N = 632) = .632, p = .427$, indicating that there was no significant relationship between sports and abstinence from alcohol use for girls in this sample.

Research Hypothesis 1.C.1: Participation in sports and athletic activities will predict abstinence from use of marijuana for all participants.

Results for all participants considered together were $\chi^2(1, N = 1,200) = 16.07, p = .000$, indicating a significant relationship between sports and marijuana. Table 4-6 presents the results this group.

<table>
<thead>
<tr>
<th>Table 4-6 Sports by Marijuana – All Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports and Athletic Activities</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Participated</td>
</tr>
<tr>
<td>Actual Count</td>
</tr>
<tr>
<td>Expected Count</td>
</tr>
<tr>
<td>Standardized Residual</td>
</tr>
<tr>
<td>No Participation</td>
</tr>
<tr>
<td>Actual Count</td>
</tr>
<tr>
<td>Expected Count</td>
</tr>
<tr>
<td>Standardized Residual</td>
</tr>
</tbody>
</table>
Although the $p$ value for the Chi square for this group was significant, the results for the R value in cell Sports x Yes (-1.9) indicates that respondents who participated in sports and athletics were no more likely to be abstinent than chance alone would predict. A serendipitous finding, however was that R values indicate that students who did not participate in sports and athletics (3.0) were more likely to use marijuana than chance would predict.

Research Hypothesis 1.C.2: Participation in sports and athletic activities will predict abstinence from use of marijuana for all male participants.

Results for males were $\chi^2(1, N = 568) = 2.65, p = .104$, indicating that there was no significant relationship between sports and abstinence from marijuana for boys in this sample.

Research Hypothesis 1.C.3: Participation in sports and athletic activities will predict abstinence from use of marijuana for all female participants.

Results for female participants were $\chi^2(1, N = 632) = 16.64, p = .000$, indicating a significant relationship between sports and marijuana for girls. Table 4-7 presents the results for this group.

<table>
<thead>
<tr>
<th>Sports and Athletic Activities</th>
<th>Marijuana R</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
</tr>
<tr>
<td>Participated</td>
<td>Actual Count</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
</tr>
<tr>
<td>No Participation</td>
<td>Actual Count</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
</tr>
</tbody>
</table>

R values indicate that girls who participated in sports and athletics were less likely to use marijuana (-2.1) than chance alone would predict. The relative risk ratio for this group = .529, indicating students who participated in sports and
athletics were approximately 52.9% less likely to use marijuana than those who did not participate. An unexpected finding was that those who did not participate were more likely to use (3.0) than would be predicted by chance.

4.5.2 Research Question 2: Arts and Civic Activities

Is participation in arts or civic activities by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of cigarettes, alcohol, or marijuana?

Research Hypothesis 2.A.1: Participation in arts and civic activities will predict abstinence from the use of cigarettes for all participants.

Results for all participants considered together were $\chi^2(1, N = 1,200) = 14.31, p = .000$, indicating a significant relationship between arts or civic activities and cigarettes. Table 4-8 presents the results for this group.

<table>
<thead>
<tr>
<th>Arts Activities</th>
<th>Marijuana R</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
<td>No Use</td>
</tr>
<tr>
<td>Participated</td>
<td>Actual Count</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>115.0</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>-2.2</td>
</tr>
<tr>
<td>No Participation</td>
<td>Actual Count</td>
<td>107</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>83.0</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>2.6</td>
</tr>
</tbody>
</table>

R values indicate that students who participated in arts or civic activities were less likely to smoke cigarettes (-2.2) than would be predicted by chance. The relative risk ratio for this group = .614, indicating students who participated in arts or civic activities were approximately 61.4% less likely to use cigarettes than those who did not participate. Although not anticipated, results indicated that those who did not participate were more likely to use (2.6) than chance alone would predict.
Research Hypothesis 2.A.2: Participation in arts and civic activities will predict abstinence from the use of cigarettes for male participants.

Results for males were $\chi^2(1, N = 568) = 5.18, p = .023$, indicating that there was no significant relationship between arts or civic activities and abstinence from cigarettes for boys in this sample.

Research Hypothesis 2.A.3: Participation in arts and civic activities will predict abstinence from the use of cigarettes for female participants.

Result for females were $\chi^2(1, N = 632) = 11.05, p = .001$, indicating there was a significant relationship between arts or civic activities and cigarettes for girls. Table 4-9 presents the results for this group.

<table>
<thead>
<tr>
<th>Arts Activities</th>
<th>Cigarettes R</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
<td>No Use</td>
<td></td>
</tr>
<tr>
<td>Participated</td>
<td>Actual Count 58</td>
<td>371</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expected Count 72.6</td>
<td>356.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standardized Residual -1.7</td>
<td>.8</td>
<td></td>
</tr>
<tr>
<td>No Participation</td>
<td>Actual Count 49</td>
<td>154</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expected Count 43.4</td>
<td>168.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standardized Residual 2.5</td>
<td>-1.1</td>
<td></td>
</tr>
</tbody>
</table>

Although the $p$ value for the Chi square for this group was minimally significant, the results for the R value in cell Sports x Yes (-1.7) does not support the conclusion that participation in Arts/Civics and athletics was correlated with abstinence from cigarettes for girls in this sample. A serendipitous finding, however, was that the standardized residuals R values indicate that girls who did not participate in arts or civics were more likely to smoke cigarettes than chance alone would predict (2.5).

Research Hypothesis 2.B.1: Participation in arts and civic activities will predict abstinence from the use of alcohol for all participants.
Results for all participants considered together were $\chi^2(1, N = 1,200) = 13.64, p = .000$, indicating a significant relationship between arts or civic activities and alcohol. Table 4-10 presents the results for this group.

**Table 4-10 Arts by Alcohol – All Participants**

<table>
<thead>
<tr>
<th>Arts Activities</th>
<th>Alcohol R</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
<td>No Use</td>
<td></td>
</tr>
<tr>
<td>Participated</td>
<td>Actual</td>
<td>288</td>
<td>409</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expected</td>
<td>319.5</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>-1.8</td>
<td>-1.9</td>
</tr>
<tr>
<td>No Participation</td>
<td>Actual</td>
<td>262</td>
<td>241</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expected</td>
<td>230.5</td>
<td>272.5</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>2.1</td>
<td>-1.9</td>
</tr>
</tbody>
</table>

Although the $p$ value for the Chi square for this group was significant, the results for the $R$ value in cell Arts/Civics $x$ Yes (-1.8) does not support the conclusion that students that participated in arts and civics were significantly more likely to be abstinent from alcohol than chance would predict. However, it was unexpected found that $R$ values indicate that participants who did not participate in arts or civics (2.1) were more likely to use alcohol than chance alone would predict.

Research Hypothesis 2.B.2: Participation in arts and civic activities will predict abstinence from the use of alcohol for male participants.

Results for males were $\chi^2(1, N = 568) = 5.48, p = .019$, indicating that there was no significant relationship between arts or civic activities and abstinence from alcohol for boys in this sample.

Research Hypothesis 2.B.3: Participation in arts and civic activities will predict abstinence from the use of alcohol for female participants.
Result for females were $\chi^2(1, N = 632) = 10.44, p = .001$, indicating there was a significant relationship between arts or civic activities and alcohol for girls. Table 4-11 presents results for this group.

**Table 4-11 Arts by Alcohol – Females**

<table>
<thead>
<tr>
<th>Arts Activities</th>
<th>Alcohol R</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
<td>No Use</td>
<td></td>
</tr>
<tr>
<td>Partcipated</td>
<td>Actual Count</td>
<td>182</td>
<td>247</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>200.9</td>
<td>228.1</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>-1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>No Participation</td>
<td>Actual Count</td>
<td>114</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>95.1</td>
<td>107.9</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>1.9</td>
<td>-1.8</td>
</tr>
</tbody>
</table>

None of the standardized residuals is either greater than ±2.0. Therefore, the direction of the influence of participation in arts or civic activities on abstinence of alcohol for females cannot be determined.

Research Hypothesis 2.C.1: Participation in arts and civic activities will predict abstinence from the use of marijuana for all participants.

Results for all participants considered together were $\chi^2(1, N = 1,200) = 25.13, p = .000$, indicating a significant relationship between arts or civic activities and marijuana. Table 4-12 presents the results for this group.

**Table 4-12 Arts by Marijuana – All Participants**

<table>
<thead>
<tr>
<th>Arts Activities</th>
<th>Marijuana R</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
<td>No Use</td>
<td></td>
</tr>
<tr>
<td>Partcipated</td>
<td>Actual Count</td>
<td>112</td>
<td>585</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>147.0</td>
<td>550.0</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>-2.9</td>
<td>1.5</td>
</tr>
<tr>
<td>No Participation</td>
<td>Actual Count</td>
<td>141</td>
<td>362</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>106.0</td>
<td>397.0</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>3.4</td>
<td>-1.8</td>
</tr>
</tbody>
</table>

R values indicate that students who participated in arts or civics were less likely to use marijuana (-2.9) than chance alone would have predicted. The relative risk ratio for this group = .573, indicating students who participated in
arts or civic activities were approximately 57.3% less likely to use marijuana than those who did not participate. An interesting unexpected finding was that those who reported that they did not participate were more likely to use (3.4) than chance would predict.

Research Hypothesis 2.C.2: Participation in arts and civic activities will predict abstinence from the use of marijuana for male participants.

Results for males were $\chi^2(1, N = 568) = 5.37$, $p = .021$, indicating that there was no significant relationship between arts or civic activities and abstinence from marijuana for boys in this sample.

Research Hypothesis 2.C.3: Participation in arts and civic activities will predict abstinence from the use of marijuana for female participants.

Results for female participants were $\chi^2(1, N = 632) = 22.29$, $p = .000$, indicating a significant relationship between arts or civic activities and marijuana for girls. Table 4-13 presents results for this group.

**Table 4-13 Arts by Marijuana – Female**

<table>
<thead>
<tr>
<th>Arts Activities</th>
<th>Marijuana R</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
</tr>
<tr>
<td>Participated</td>
<td></td>
</tr>
<tr>
<td>Actual Count</td>
<td>64</td>
</tr>
<tr>
<td>Expected Count</td>
<td>86.2</td>
</tr>
<tr>
<td>Standardized Residual</td>
<td>-2.4</td>
</tr>
<tr>
<td>No Participation</td>
<td></td>
</tr>
<tr>
<td>Actual Count</td>
<td>63</td>
</tr>
<tr>
<td>Expected Count</td>
<td>40.8</td>
</tr>
<tr>
<td>Standardized Residual</td>
<td>3.5</td>
</tr>
</tbody>
</table>

R values indicate that girls who participated in arts or civic activities were less likely to use marijuana (-2.4) than chance alone would predict. The relative risk ratio for this group = .481, indicating students who participated in arts or civic activities were approximately 48.1% less likely to use marijuana than those who did not participate. A serendipitous finding was that those who reported they
did not participate in arts and civic activities were more likely to use (3.5) than would be predicted by chance.

4.5.3 Research Question 3: Religious Activities

Is participation in religious activities by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of cigarettes, alcohol, or marijuana?

Research Hypothesis 3.A.1: Participation in religious activities will predict abstinence from the use of cigarettes for all participants.

Results for all participants considered together were $\chi^2(1, N = 1,200) = 25.20, p = .000$, indicating a significant relationship between religious activities and cigarettes. Table 4-14 presents the results for this group.

<table>
<thead>
<tr>
<th>Religious Activities</th>
<th>Cigarettes R</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
<td>No Use</td>
<td></td>
</tr>
<tr>
<td>Participated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Count</td>
<td>87</td>
<td>632</td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td>118.6</td>
<td>600.4</td>
<td></td>
</tr>
<tr>
<td>Standardized Residual</td>
<td>-2.9</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>No Participation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Count</td>
<td>111</td>
<td>370</td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td>79.4</td>
<td>401.6</td>
<td></td>
</tr>
<tr>
<td>Standardized Residual</td>
<td>3.6</td>
<td>-1.6</td>
<td></td>
</tr>
</tbody>
</table>

R values indicate that students who participated in religious activities were less likely to use cigarettes (-2.9) than chance would have predicted. The relative risk ratio for this group = .524, indicating students who participated in religious activities were approximately 52.4% less likely to use cigarettes than those who did not participate. An interesting ad hoc finding was those that did not participate were more likely to use (3.6) than would be predicted by chance.

Research Hypothesis 3.A.2: Participation in religious activities will predict abstinence from the use of cigarettes for male participants.
Results for males were $\chi^2(1, N = 568) = 4.56, p = .033$, indicating that there was no significant relationship between religious activities and abstinence from cigarettes for boys in this sample.

Research Hypothesis 3.A.3: Participation in religious activities will predict abstinence from the use of cigarettes for female participants.

Results for female participants were $\chi^2(1, N = 632) = 24.30, p = .000$, indicating a significant relationship between religious activities and cigarettes for girls. Table 4-15 presents the results for this group.

<table>
<thead>
<tr>
<th>Religious Activities</th>
<th>Cigarettes_R</th>
<th>Actual Count</th>
<th>Expected Count</th>
<th>Standardized Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participated</td>
<td></td>
<td>44</td>
<td>66.5</td>
<td>-2.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>349</td>
<td>326.5</td>
<td>1.2</td>
</tr>
<tr>
<td>No Participation</td>
<td></td>
<td>63</td>
<td>40.5</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>176</td>
<td>198.5</td>
<td>-1.6</td>
</tr>
</tbody>
</table>

R values indicate that girls who participated in religious activities were less likely to use cigarettes (-2.8) than would be predicted by chance. The relative risk ratio for this group = .425, indicating students who participated in religious activities were approximately 42.5% less likely to use cigarettes than those who did not participate. Interestingly, a serendipitous finding was that those reported they did not participate in religious activities were more likely to use (3.5) than chance would predict.

Research Hypothesis 3.B.1: Participation in religious activities will predict abstinence from the use of alcohol for all participants.
Results for all participants considered together were $\chi^2(1, N = 1,200) = 4.30, p = .038$, indicating that there was no significant relationship between religious activities and abstinence from alcohol use in this sample.

Research Hypothesis 3.B.2: Participation in religious activities will predict abstinence from the use of alcohol for male participants.

Results for males were $\chi^2(1, N = 568) = 4.04, p = .044$, indicating that there was no significant relationship between religious activities and abstinence from alcohol use for boys in this sample.

Research Hypothesis 3.B.3: Participation in religious activities will predict abstinence from the use of alcohol for female participants.

Results for females were $\chi^2(1, N = 632) = .99, p = .319$, indicating that there was no significant relationship between religious activities and abstinence from alcohol use for girls in this sample.

Research Hypothesis 3.C.1: Participation in religious activities will predict abstinence from the use of marijuana for all participants.

Results for all participants considered together were $\chi^2(1, N = 1,200) = 23.53, p = .000$, indicating a significant relationship between religious activities and marijuana. Table 4-16 presents the results for this group.

| Table 4-16 Religion by Marijuana – All Participants |
|-----------------------------------------------|---|---|
| Religious Activities | Marijuana R | |
| | Used | No Use |
| Participated | Actual Count | 118 | 601 |
| | Expected Count | 151.6 | 567.4 |
| | Standardized Residual | -2.7 | 1.4 |
| No Participation | Actual Count | 135 | 346 |
| | Expected Count | 101.4 | 379.6 |
| | Standardized Residual | 3.3 | -1.7 |
R values indicate that students who participated in religious activities were less likely to use marijuana (-2.7) than chance would predict. The relative risk ratio for this group = .585, indicating students who participated in religious activities were approximately 58.5% less likely to use marijuana than those who did not participate. However, it was also unexpectedly found that those who reported no participation in religious activities were more likely to use (3.3) than chance alone would have predicted.

Research Hypothesis 3.C.2: Participation in religious activities will predict abstinence from the use of marijuana for male participants.

Results for male participants were $\chi^2(1, N = 568) = 12.51, p = .000$, indicating a significant relationship between religious activities and marijuana for boys. Table 4-17 presents the results for this group.

<table>
<thead>
<tr>
<th>Religious Activities</th>
<th>Marijuana R Used</th>
<th>No Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participated</td>
<td>Actual Count</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>72.3</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>-2.0</td>
</tr>
<tr>
<td>No Participation</td>
<td>Actual Count</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>53.7</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>2.4</td>
</tr>
</tbody>
</table>

R values indicate that boys who participated in religious activities were less likely to use marijuana (-2.0) than chance alone would have predicted. The relative risk ratio for this group = .575, indicating students who participated in religious activities were approximately 57.5% less likely to use marijuana than those who did not participate. Again, an interesting ad hoc finding was that those who reported that they did not participate were more likely to use (2.4) than would be practiced by chance.
Research Hypothesis 3.C.3: Participation in religious activities will predict abstinence from the use of marijuana for female participants.

Results for female participants were \( \chi^2(1, N = 632) = 10.69, p = .001 \), indicating a significant relationship between religious activities and marijuana for girls. Table 4-18 presents the results for this group.

**Table 4-18 Religion by Marijuana – Females**

<table>
<thead>
<tr>
<th>Religious Activities</th>
<th>Marijuana R</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
<td>No Use</td>
</tr>
<tr>
<td>Participated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Count</td>
<td>63</td>
<td>330</td>
</tr>
<tr>
<td>Expected Count</td>
<td>79.0</td>
<td>314.0</td>
</tr>
<tr>
<td>Standardized Residual</td>
<td>-1.8</td>
<td>9</td>
</tr>
<tr>
<td>No Participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Count</td>
<td>64</td>
<td>175</td>
</tr>
<tr>
<td>Expected Count</td>
<td>48.0</td>
<td>191.0</td>
</tr>
<tr>
<td>Standardized Residual</td>
<td>2.3</td>
<td>-1.2</td>
</tr>
</tbody>
</table>

Although the \( p \) value for the Chi square for this group was significant, the results for the R value in cell Religion x Yes (-1.8) does not support the conclusion that girls who participated in religious activities were significantly more likely to abstain from marijuana than chance alone would have predicted. Although not anticipated, R values indicate that girls who did not participate in religious activities were more likely to use marijuana (2.3) than would be predicted by chance.

4.5.4 Research Question 4: Volunteering and Community Activities

Is participation in volunteering or community activities by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of cigarettes, alcohol, or marijuana?

Research Hypothesis 4.A.1: Participation in volunteering and community activities will predict abstinence from the use of cigarettes for all participants.
Results for all participants considered together were $\chi^2(1, N = 1,200) = 15.01, p = .000$, indicating a significant relationship between volunteering or community activities and cigarettes. Table 4-19 presents results for this group.

**Table 4-19 Volunteering by Cigarettes – All Participants**

<table>
<thead>
<tr>
<th>Volunteering Activities</th>
<th>Cigarettes R</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
<td>No Use</td>
<td></td>
</tr>
<tr>
<td>Participated</td>
<td>Actual Count</td>
<td>60</td>
<td>453</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>84.6</td>
<td>428.4</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>-2.7</td>
<td>1.2</td>
</tr>
<tr>
<td>No Participation</td>
<td>Actual Count</td>
<td>138</td>
<td>549</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>113.4</td>
<td>573.6</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>2.3</td>
<td>-1.0</td>
</tr>
</tbody>
</table>

R values indicate that students who participated in volunteering or community activities were less likely to use cigarettes (-2.7) than would be predicted by chance. The relative risk ratio for this group = .582, indicating students who participated in volunteering or community activities were approximately 58.2% less likely to use cigarettes than those who did not participate. An unexpected and interesting finding was that those who reported they did not participate were more likely to use (3.3) than chance would predict.

Research Hypothesis 4.A.2: Participation in volunteering and community activities will predict abstinence from the use of cigarettes for male participants.

Results for males were $\chi^2(1, N = 568) = 2.54, p = .111$, indicating that there was no significant relationship between volunteering or community activities and abstinence from cigarettes for boys in this sample.

Research Hypothesis 4.A.3: Participation in volunteering and community activities will predict abstinence from the use of cigarettes for female participants.
Results for female participants were $\chi^2(1, \ N = 632) = 15.10, \ p = .000$, indicating a significant relationship between volunteering or community activities and cigarettes for girls. Table 4-20 presents the results for this group.

**Table 4-20 Volunteering by Cigarettes – Females**

<table>
<thead>
<tr>
<th>Volunteering Activities</th>
<th>Cigarettes R</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
<td>No Use</td>
</tr>
<tr>
<td>Participated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Count</td>
<td>34</td>
<td>275</td>
</tr>
<tr>
<td>Expected Count</td>
<td>52.3</td>
<td>256.7</td>
</tr>
<tr>
<td>Standardized Residual</td>
<td>-2.5</td>
<td>1.1</td>
</tr>
<tr>
<td>No Participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Count</td>
<td>73</td>
<td>250</td>
</tr>
<tr>
<td>Expected Count</td>
<td>54.7</td>
<td>268.3</td>
</tr>
<tr>
<td>Standardized Residual</td>
<td>2.5</td>
<td>-1.1</td>
</tr>
</tbody>
</table>

R values indicate that girls who participated in volunteering or community activities were less likely to use cigarettes (-2.5) than would be predicted by chance alone. The relative risk ratio for this group = .487, indicating students who participated in volunteering or community activities were approximately 48.7% less likely to use cigarettes than those who did not participate. As was unexpectedly found among all participants, those that did not participate were more likely to use (2.5) than chance would predict.

Research Hypothesis 4.B.1: Participation in volunteering and community activities will predict abstinence from the use of alcohol for all participants.

Results for all participants considered together were $\chi^2(1, \ N = 1,200) = 7.89, \ p = .005$, indicating that there was no significant relationship between volunteering and community activities and alcohol in this sample.

Research Hypothesis 4.B.2: Participation in volunteering and community activities will predict abstinence from the use of alcohol for male participants.
Results for males were $\chi^2(1, N = 568) = 3.90, p = .048$, indicating that there was no significant relationship between volunteering or community activities and abstinence from alcohol for boys in this sample.

Research Hypothesis 4.B.3: Participation in volunteering and community activities will predict abstinence from the use of alcohol for female participants.

Results for females were $\chi^2(1, N = 6328) = 4.78, p = .029$ indicating that there was no significant relationship between volunteering or community activities and abstinence from alcohol for girls in this sample.

Research Hypothesis 4.C.1: Participation in volunteering and community activities will predict abstinence from the use of marijuana for all participants.

Results for all participants considered together were $\chi^2(1, N = 1,200) = 21.16, p = .000$, indicating a significant relationship between volunteering or community activities and marijuana. Table 4-21 presents the results for this group.

<table>
<thead>
<tr>
<th>Volunteering Activities</th>
<th>Marijuana Used</th>
<th>Marijuana No Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participated</td>
<td>Actual Count</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>108.2</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>-3.1</td>
</tr>
<tr>
<td>No Participation</td>
<td>Actual Count</td>
<td>177</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>144.8</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>2.7</td>
</tr>
</tbody>
</table>

R values indicate that students who participated in volunteering or community activities were less likely to use marijuana (-3.1) than chance alone would predict. The relative risk ratio for this group = .575, indicating students who participated in volunteering or community activities were approximately 57.5% less likely to use marijuana than those who did not participate. As was
unexpectedly found for other independent variables, students who reported that they did not participate in volunteering and community activities were more likely to use (2.7) than would be predicted by chance alone.

Research Hypothesis 4.C.2: Participation in volunteering and community activities will predict abstinence from the use of marijuana for male participants.

Results for males were $\chi^2(1, N = 568) = 3.79, p = .051$, indicating that there was no significant relationship between volunteering or community activities and abstinence from marijuana for boys in this sample.

Research Hypothesis 4.C.3: Participation in volunteering and community activities will predict abstinence from the use of marijuana for female participants.

Results for female participants were $\chi^2(1, N = 632) = 19.25, p = .000$, indicating a significant relationship between volunteering or community activities and marijuana for girls. Table 4-22 resents results for this group.

<table>
<thead>
<tr>
<th>Volunteering Activities</th>
<th>Marijuana</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
<td>No Use</td>
</tr>
<tr>
<td>Participated</td>
<td>Actual Count</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>62.1</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>-2.8</td>
</tr>
<tr>
<td>No Participation</td>
<td>Actual Count</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>64.9</td>
</tr>
<tr>
<td></td>
<td>Standardized Residual</td>
<td>2.7</td>
</tr>
</tbody>
</table>

R values indicate that girls who participated in volunteering or community activities were less likely to use marijuana (-2.8) than chance alone would predict. The relative risk ratio for this group = .481, indicating students who participated in sports and athletics were approximately 48.1% less likely to use marijuana than those who did not participate. However, it was unexpectedly found that those who
reported that they did not participate were more likely to use (2.7) than would be predicted by chance.

4.5.5 Research Question 5: Alcohol and Drug Prevention Clubs

Is participation in alcohol and drug prevention clubs by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of cigarettes, alcohol, or marijuana?

Research Hypothesis 5.A.1: Participation in alcohol and drug prevention clubs will predict abstinence from the use of cigarettes for all participants.

Results for all participants considered together were \( \chi^2(1, N = 1,200) = .85, p = .358 \), indicating that there was no significant relationship between drug prevention clubs and abstinence from cigarettes in this sample.

Research Hypothesis 5.A.2: Participation in alcohol and drug prevention clubs will predict abstinence from the use of cigarettes for male participants.

Results for males were \( \chi^2(1, N = 568) = .09, p = .771 \), indicating that there was no significant relationship between alcohol and drug prevention clubs and abstinence from cigarettes for boys in this sample.

Research Hypothesis 5.A.3: Participation in alcohol and drug prevention clubs will predict abstinence from the use of cigarettes for female participants.

Results for females were \( \chi^2(1, N = 632) = .965, p = .326 \), indicating that there was no significant relationship between drug prevention clubs and abstinence from cigarettes for girls in this sample.

Research Hypothesis 5.B.1: Participation in alcohol and drug prevention clubs will predict abstinence from the use of alcohol for all participants.
Results for all participants considered together were $\chi^2(1, N = 1,200) = 2.94, p = .086$, indicating that there was no significant relationship between drug prevention clubs and abstinence from alcohol in this sample.

Research Hypothesis 5.B.2: Participation in alcohol and drug prevention clubs will predict abstinence from the use of alcohol for male participants.

Results for males were $\chi^2(1, N = 568) = .08, p = .784$, indicating that there was no significant relationship between drug prevention clubs and abstinence from alcohol for boys in this sample.

Research Hypothesis 5.B.3: Participation in alcohol and drug prevention clubs will predict abstinence from the use of alcohol for female participants.

Results for females were $\chi^2(1, N = 632) = 4.36, p = .037$, indicating that there was no significant relationship between drug prevention clubs and abstinence from alcohol for girls in this sample.

Research Hypothesis 5.C.1: Participation in alcohol and drug prevention clubs will predict abstinence from the use of marijuana for all participants.

Results for all participants considered together were $\chi^2(1, N = ) = .01, p = .930$, indicating that there was no significant relationship between drug prevention clubs and abstinence from marijuana in this sample.

Research Hypothesis 5.C.2: Participation in alcohol and drug prevention clubs will predict abstinence from the use of marijuana for male participants.

Results for males were $\chi^2(1, N = 568) = 1.16, p = .282$, indicating that there was no significant relationship between drug prevention clubs and abstinence from marijuana for boys in this sample.
Research Hypothesis 5.C.3: Participation in alcohol and drug prevention clubs will predict abstinence from the use of marijuana for female participants.

Results for females were $\chi^2(1, N = 632) = .77, p = .381$, indicating that there was no significant relationship between drug prevention clubs and abstinence from marijuana for girls in this sample.

4.6 Summary

Data from the 2006 Lucas County (Ohio) Alcohol and Drug Addiction Services (ADAS) Board Youth Alcohol & Other Drug Use Survey were retrospectively examined to determine if five social resiliency factors, participation in sports or athletic activities, arts or civic activities, religious activities, volunteering or community activities, and alcohol and drug prevention clubs, were associated with abstinence from use of cigarettes, alcohol, and marijuana. Due to the categorical nature of the data, a 2 x 2 Chi square analysis was used to determine if the social resiliency factors (independent variables) were associated with abstinence from cigarettes, alcohol, and marijuana (dependent variables) more than would be accounted for by chance.

A sample of 1,200 participants, proportionally stratified in order to be representative of the population in regard to sex and grade level, was drawn from the population. Chi square analyses were performed for the entire sample, then for males and females separately, for each combination of dependent and independent variable. Post hoc analyses of standardized residuals and Relative Risk Ratios were computed for all three groups where Chi square results were found to be significant at the $p < .001$ level. Social resiliency factors (independent variables) were considered to be positively associated with abstinence from the dependent variables if the standardized residual for the cell resiliency factor by substance use was less than negative two (-2.0).
Results indicated that participation in sports and athletic activities was associated with abstinence from use of cigarettes more than chance would predict in the sample as a whole, as well as females considered separately. Sports and athletics were not, however, associated with abstinence from cigarettes for boys more than would be accounted for by chance. Sports and athletic activities were not found to be associated with abstinence from alcohol more than chance would predict for any group. Girls who participated in sports and athletics were found to be less likely to use marijuana than would be predicted by chance, but this was not found to be true for boys. The $p$ value for the sample as a whole for marijuana was significant, but the R value did not indicate the direction of the association.

Arts and civic activities were associated with abstinence from use of cigarettes more than would be predicted by chance alone for the sample as a whole, but not for males. The $p$ value for females was significant, but the R values did not support the association between participation in arts and civic activities and abstinence from cigarettes more than could be explained by chance for girls. Although the $p$ values for arts and civic activities and alcohol were significant for the whole sample and for females considered alone, the R values did not indicated the direction of the association. Arts and civic activities were associated with abstinence from the use of marijuana more than would be predicted by chance in the whole sample and for females, but not for males. Participation in arts and civic activities by males was not found to be associated with abstinence from cigarettes, alcohol, or marijuana more than chance would predict.

Religious activities were associated with abstinence from use of cigarettes more than would be predicted by chance alone for the sample as a whole and for females, but not for males. Religious activities were not found to be associated with abstinence from
alcohol for any group. Religious activities were associated with abstinence from use of marijuana more than would be predicted by chance alone for the sample as a whole and for males. Although the p value for females and marijuana was significant, the R value did not support the association between participation in religious activities and abstinence from marijuana more than could be explained by chance in this group.

Results indicated that volunteering and community activities were associated with abstinence from cigarettes and marijuana more that chance would predict for the sample as a whole and for females considered separately, but not for males. Volunteering and community activities were not associated from abstinence from alcohol more that would be explained by chance for the sample as a whole, or for males or females considered separately. Participation in volunteering and community activities by males was not found to be associated with abstinence from cigarettes or marijuana more than chance would predict. Finally, participation in alcohol and drug prevention clubs was not associated with abstinence from cigarettes, alcohol, or marijuana more than would be predicted by chance for the sample as a whole, or for males or females considered separately.

An unexpected serendipitous finding was observed. In all groups where the Chi square for abstinence and participation in the social resiliency factor was found to be significant, the standardized residual for the combination of substance use by non-participation in the resiliency factor was also found to be significant. Additionally, the substance use/non-participation combination was found to be significant in four cases where the Chi square for non-substance use and participation in the social resiliency factor was not found to be significant.
Chapter Five

Discussion

5.1 Overview

Adolescent alcohol and other drug (AOD) use continues to have negative effects on the lives of individual young people and their families despite extensive efforts at problem identification and intervention (Meschke & Patterson, 2003). Chen et al. (2004) identified adolescent AOD use as “one of the most prevalent social problems in the United States” (p. 413). The negative consequences of adolescent AOD use include addiction and other negative health effects, mental health problems such as depression, interpersonal problems with family and peers, and injury or death from automobile accidents. Additionally, adolescent AOD use has serious social and economic effects on families and society as a whole (Chen et al. ) including the cost of treatment, traffic injuries and deaths, illness, absenteeism from school and work, family-related problems, and suicide (Wodarski, 1990).

There have been several large scale efforts to measure and monitor the problem of adolescent AOD use including the Monitoring the Future (MTF) project (Johnson et al., 2007), the Youth Risk Behavior Surveillance System (YRBSS) survey by the Centers for Disease Control and Prevention (CDC), and the Substance Abuse and Mental Health
Services Administration’s (SAMHSA) *National Survey on Drug Use and Health*. Additionally, state and local groups, such as the Lucas County (Ohio) Alcohol and Drug Addiction Services (ADAS) Board, have made efforts to measure and monitor the problem locally.

Research in this area has traditionally focused on identifying risk factors that may be helpful in identifying youth in need of intervention and/or treatment for AOD problems. Hawkins et al. (1992) described two broad categories of risk factors, or “precursors” (p. 65), that may affect or influence adolescents to engage in AOD use. The first, termed socio-cultural factors, includes widespread influences that affect large groups of people or society as a whole. Examples include poverty, population density, crime rates, local AOD laws, and commitment of law enforcement to enforce those laws. The second category, individual and interpersonal factors, includes biochemical influences, impulse control, conflicts with family and peers, and individual tendencies to self medicate with AOD to alter negative emotional states. Prevention efforts have also been targeted at young people exposed to these risks. Drawbacks to exclusive use of the risk factor approach to the problem of adolescent AOD use include focusing on young people already using AOD rather than those that have avoided doing so, stigmatizing disadvantaged populations, and the difficulty of performing empirical research in the area.

A resiliency perspective has been offered as an alternative to the risk-factor orientation to research (Goldstein & Brooks, 2005; Hawkins et al., 1999; Meschke & Patterson, 2003; Wolkow & Ferguson, 2001). Researchers using the resiliency approach aim to provide insight into why many adolescents, despite exposure to multiple risk-factors, do not use AOD. Additionally, use of the resiliency approach may help prevent
substance abuse by identifying and promoting factors that influence adolescents to avoid AOD use and abuse. This approach has several advantages including simultaneous consideration of both risk and protective factors, examination of how multiple systems interact to affect young people, and efficacy in proactively preventing AOD use in adolescent versus addressing problems after they have been initiated.

Wolkow and Ferguson (2001) identified several potential drawbacks to the resiliency approach. These include the current lack of empirical support for the concept and potential difficulty in persuading parents, as well as school and community leaders, to change established ways of looking at adolescent AOD use. Despite these drawbacks, the resiliency approach shows promise in developing an alternative way of addressing the problem of adolescent AOD use.

Within the categories described by Meschke and Patterson (2003) and Goldstein and Brooks (2005), multiple specific potential social resiliency factors can be identified. Five of these specific factors were examined in this study. The first sports and athletic activities, has often been proposed to be protective against adolescent AOD use. Research in this area is mixed, but appears to show that sports and athletic participation is less protective against alcohol use than other substances, especially among males (Harrison & Narayan, 2003; Moore & Werch, 2005; Pate et al., 1996).

The second factor examined, religious participation, has also been commonly identified as a potentially positive influence because religious values are often thought to be inconsistent with AOD use. Again, research in this area is mixed. A review of the literature revealed that protection may vary by religious denomination and depend more on the degree to which the adolescent has internalized the values and beliefs of their specific religion, rather than merely on whether they participate in worship or associated
activities (Benda et al., 2006; Francis, 1997; Heath et al., 1999; Hodge et al., 2001; Nonnemaker et al., 2003).

The third factor examined was arts and civic activities. The review of the literature revealed this to be a somewhat broad category and researchers often combined activities in differencing ways making comparison of results problematic. For example, Eccles and Barber (1990) combined debate and chess clubs with “performance activities” (p. 14), while Duncan et al. (2002) grouped ethnic clubs with music and “arts and crafts” (p. 429) activities. Consequently, there appears to be little consensus as to whether arts and civic activities in general are protective. Eccles and Barber noted, however, that adolescents who participate in these endeavors are generally supervised by adults, limiting the opportunities for indulgence in AOD use, and that young people who chose to participate in religious activities may have already identified with values inconsistent with AOD use.

The fourth factor investigated in this study was volunteering and community activities, which includes participation in scouting, 4-H, YMCA, and other similar programming. Examination of research in this area was difficult for the same reasons noted in the section on arts and civic activities. Specifically, researchers (Duncan, et al., 2002; Eccles & Barber, 1999) defined the category differently and included different activities. Additionally, Eccles and Barber argue that any protective effects found may be due to adult supervision of the activities and prior identification with established values of these programs.

Finally, the potential protective effects of participation in AOD drug prevention programs were examined. In the 1980s, social influences were found to be a major reason adolescents engaged in AOD use (Donaldson et al., 1996) and programming based on
this assumption was developed. There are a great number of AOD prevention programs that address varying social influences. Common aspects of these programs include education regarding the physical effects of AOD use, presentation of accurate information regarding the prevalence of AOD use, assertion refusal skills instruction and practice, and information regarding the influence of culture, including the media.

Multiple researchers (Donaldson et al., 1996; Hansen et al., 2007; Hawkins et al., 1992; VanderWaal et al, 2005) have noted that the most successful programs combine primary prevention with community measures, such as limiting the availability of AOD to adolescents, providing supervised activities, and enforcing laws regarding AOD use by young people. Additionally, prevention programs that involved active participation by adolescents were found to be more beneficial than those that were didactic only.

5.2 Method

The researcher utilized a 2 x 2 Chi square analysis to examine whether participation in social resiliency activities is associated with abstinence from AOD more than would be predicted by chance. This was a retrospective study that used data from the 2006 Lucas County (Ohio) Alcohol and Drug Addiction Services (ADAS) Board Youth Alcohol & Other Drug Use Survey, commonly referred to as the 2006 ADAS Student Survey (Piazza & Ivoska, 2007). The specific substances examined included alcohol, tobacco, and marijuana. Although adolescents frequently first experiment with AOD use in grades 8 or 9, many do not continue to use beyond these grades (Hawkins et al., 1992). The study was limited to grades 10 through 12 in order to determine if adolescents who report abstaining from AOD use were more likely to participate in the identified social resiliency activities than respondents who report alcohol, tobacco, or marijuana use.
The independent variables examined were participation in sports or athletic activities, arts or civic activities, religious activities, volunteering or community activities, or alcohol and drug prevention clubs, as well as gender and grade level. The dependent variables examined in this study were tobacco, alcohol, and marijuana use.

The researcher used a 2 x 2 Chi square analysis to examine whether participation in social resiliency activities was correlated with abstinence from alcohol, cigarettes, and marijuana more than would be predicted by chance. The Chi square was chosen because it is suited for use with categorical data where employing a parametric test would be inappropriate (Hinkle et al., 2003).

Participants were students in grades 10 through 12 attending all public and parochial schools in Lucas County, Ohio, who were present the day the ADAS Board survey was administered. A sample of 1,200 participants, proportionally stratified in order to be representative of the population as a whole in terms of gender and grade level, was drawn from the population. Chi square analyses were performed for the entire sample, then for males and females separately, for each combination of dependent and independent variable. Post hoc analyses of residuals were performed for all three groups and relative risk ratios were computed for significant findings. The Bonferroni correction was used to adjust the alpha level, originally set at .05, to reduce the risk of Type I error. Results were considered significant if at or below the .001 level of probability (\( p \leq 0.001 \)). Resiliency factors (independent variables) were considered to be positively associated with abstinence from the dependent variables if the standardized residual for the cell resiliency factor by substance use was less than negative two (-2.0).
5.3 Research Results

5.3.1 Research Question 1

Does participation in sports or athletic activities by students in grades 10 through 12 in Lucas County, Ohio, predict abstinence from use of tobacco, alcohol, or marijuana relative to sex and grade level?

Results indicated that participation in sports and athletic activities was associated with abstinence from use of cigarettes more than chance would predict in the sample as a whole, as well as among female participants. Sports and athletics were not, however, associated with abstinence from cigarettes for boys more than would be accounted for by chance. Sports and athletic activities were not found to be associated with abstinence from alcohol for any group. Girls who participated in sports and athletics were found to be less likely to use marijuana than would be predicted by chance, but this was not found to be true for boys. The \( p \) value for the sample as a whole for marijuana was significant, but the \( R \) value did not indicate the direction of the association. An interesting serendipitous finding was that for females and the sample as a whole, participants who reported no participation in sports and athletic activities were found to be significantly more likely to use cigarettes and marijuana than those that did report participation.

5.3.2 Research Question 2

Is participation in arts or civic activities by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of tobacco, alcohol, or marijuana relative to sex and grade level?

Arts and civic activities were associated with abstinence from use of cigarettes more than would be predicted by chance alone for the sample as a whole, but not for males. The \( p \) value for females was significant, but the \( R \) values did not support the
association between participation in arts and civic activities and abstinence from cigarettes more than could be explained by chance for girls. Although the $p$ values for arts and civic activities and alcohol were significant for the whole sample and for female participants, the $R$ values did not indicate the direction of the association. Arts and civic activities were associated with abstinence from the use of marijuana more than would be predicted by chance in the whole sample and for females, but not for males. Participation in arts and civic activities by males was not found to be associated with abstinence from cigarettes, alcohol, or marijuana more than chance would predict. Unexpectedly, lack of participation in arts and civic activities was associated with the use of alcohol more than would be accounted for by chance in the whole sample. For females and the entire sample, lack of participation was associated with cigarette and marijuana use more than could be explained by chance.

5.3.3 Research Question 3

Is participation in religious activities by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of tobacco, alcohol, or marijuana relative to sex and grade level?

Religious activities were associated with abstinence from use of cigarettes more than would be predicted by chance alone for the sample as a whole and for females, but not for males. Religious activities were not found to be associated with abstinence from alcohol for any group. Religious activities were associated with abstinence from use of marijuana more than would be predicted by chance alone for the sample as a whole and for males. Although the $p$ value for females and marijuana was significant, the $R$ value did not support the association between participation in religious activities and abstinence from marijuana more than could be explained by chance in this group. As with athletic
and arts/civic activities, lack of participation is religious activities was associated with cigarette and marijuana use for females and the entire sample, as well as for marijuana use by males, more than can be accounted for by chance.

5.3.4 Research Question 4

Is participation in volunteering or community activities by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of tobacco, alcohol, or marijuana relative to sex and grade level?

Results indicated that volunteering and community activities were associated with abstinence from cigarettes and marijuana more than chance would predict for the sample as a whole and for females considered separately. Volunteering and community activities were not associated from abstinence from alcohol more than would be explained by chance for the sample as a whole, or for males or females considered separately. Participation in volunteering and community activities by males was not found to be associated with abstinence from cigarettes, or marijuana more than chance would predict. Unexpectedly, lack of participation in volunteering activities was found to be associated with use of cigarettes and marijuana more than would be explained by chance in the sample as a whole and for females.

5.3.5 Research Question 5

Is participation in alcohol and drug prevention clubs by students in grades 10 through 12 in Lucas County, Ohio, predictive of abstinence from use of tobacco, alcohol, or marijuana relative to sex and grade level?

Participation in alcohol and drug prevention clubs was not associated with abstinence from cigarettes, alcohol, or marijuana more than would be predicted by chance for the sample as a whole, or for males or females considered separately.
5.4 Discussion

5.4.1 Sports and athletic activities

Although previous research has suggested that sports and athletics are associated with abstinence from cigarette use (Leonard, 1999; Harrison & Narayan, 2003; Moore & Werch, 2005), this was only found to be true for girls in this study. Results were consistent with research that suggests that sports and athletic activities are not strongly protective against alcohol use, especially for males (Leonard, 1999; Harrison & Narayan, 2003; Moore & Werch, 2005). Results from this study indicate that participation in sports and athletic activities is not associated with abstinence from alcohol for boys or girls in this sample. Although research that has suggested sports and athletics may be protective of marijuana use (Leonard; Harrison & Narayan; Moore & Werch), this was found to be true only for girls in this study.

There may be several reasons why sports and athletic activities are more strongly associated with abstinence from cigarettes, but not with alcohol or marijuana. Cigarette use is likely to have a more prolonged negative effect on physical performance in terms of lung capacity, ability to breathe well during activity, etc., while this is unlikely to be true of alcohol or even marijuana, given that the amount and frequency of marijuana use is generally less than that of cigarettes. As noted by Moore and Werch (2005), there appears to be an association between sports and AOD use in our culture which may influence young people who participate in sports and athletics to be more tolerant of use.

It should also be noted that this category, interpreted broadly, may include a variety of activities from organized high school football to yoga, for example. It is possible that the results obtained are more representative of the influence of some
activities more than others. However, the study was not designed to detect the association between various specific activities and adolescent AOD use.

5.4.2 Arts and civic activities

Results for arts and civic activities were mixed, with participation being associated with abstinence from cigarettes and marijuana for females, but not males. There did not appear to be a strong association between participation and abstinence from alcohol for either gender. These results generally support extant research that suggests arts and civic activities may be protective against adolescent AOD in some circumstances. A factor that may have an influence on the inconsistent results is the broadness of the category of arts and civic activities. As defined in the 2006 ADAS Student Survey (Piazza & Ivoska, 2007) used in this study, arts and civic activities include “theatre, band, choir, orchestra, school clubs, honor society, etc.” (pg. 4). School clubs is rather broad itself and may include activities such as chess or computers, which may have little in common with theatre or orchestra. Also, the term “civic activity” may be unclear to young people and easily confused with volunteering and community activities question later in the survey. Finally, the inclusion of “etc.” at the end of the question may lead adolescents to respond positively to any number of unidentified activities. The ambiguity of the question may contribute to the lack of consistency in results and make evaluation of the results difficult. Where arts and civic activities have been found to be associated with abstinence, the positive effect may be due to lack of idle time for young people, adult supervision, and identification with positive values (Duncan et al., 2002; Eccles & Barber, 1999). Finally, as with arts and civic activities, the study was not designed to detect the association between various activities and adolescent AOD use.
5.4.3 Religious activities

The results obtained in this study indicate that in this sample, religious activities are associated with abstinence from cigarettes in females and from marijuana in males, but not at all with abstinence from alcohol for either gender. The research regarding the association between adolescent AOD and religious activities is mixed. As with arts and civic activities, any benefit is theorized to be due to the structured and supervised time provided by the activities, as well as internalization of associated values either before or after engaging in religious activities (Benda et al., 2006; Francis, 1997; Heath et al., 1999; Hodge et al., 2001; Nonnemaker et al., 2003). Personal beliefs were also found to be more strongly protective against adolescent AOD use than simply engaging in religious activities (Hodge, et al; Nonnemaker, et al.). Results from this study are similarly mixed.

5.4.4 Volunteering or community activities

In this study, volunteering and community activities were found to be associated with abstinence from cigarettes and marijuana more than would be accounted for by chance for females only. Results were negative for males for all three substances i.e. boys who participated in volunteering or community activities were no more likely than chance would predict to be abstinent from cigarettes, alcohol, and marijuana. The research for volunteering and community activities has produced inconsistent results, possibly due to differences in the activities included in the category (Eccles & Barber, 2002; Fredericks & Eccles, 2006a). This category is also somewhat loosely defined in the ADAS survey as “YMCA, scouting, etc.” (pg. 4) leaving some doubt that the question is measuring similar activities or that students interpreted the question as intended. Any
significance found for this variable may be due to the structured and supervised time provided by the activities.

5.5.5 Alcohol and drug prevention clubs

Results support previous research that suggests that alcohol and drug prevention clubs are not strongly protective of adolescent AOD use (Donaldson et al., 1996; Hansen et al., 2007; VanderWaal et al., 2005). In fact, alcohol and drug prevention programs were not found to be associated with abstinence more than would be predicted by chance for any group or substance. It is unknown how often or at what grade level the various school systems in Lucas County present or make available drug and alcohol prevention clubs or programs. There may also be variation in the types of programs offered by different school systems. This information would be helpful in evaluating if the results obtained are due to lack of programming, lack of participation, or some other factor.

5.5.6 Serendipitous findings

As reported, lack of participation was found to be associated with substance use more than would be explained by chance in all groups where the Chi square for abstinence and participation in the social resiliency factor was found to be significant. Additionally, the substance use/non-participation combination was found to be significant in four cases where the Chi square for non-substance use and participation in the social resiliency factor was not found to be significant. Where both participation/abstinence and non-participation/use combinations were found to be significant, it would appear that, in this sample, the examined social resiliency factors may be risk as well as resiliency factors, depending on participation. Significance of only the non-participation/use combination suggests that although the activity is not associated with abstinence in this sample, it may be a risk factor for students that do not participate in the activity.
5.5 Clinical Implications

Encouraging participation in resiliency activities has been proposed as a possible way for clinicians to intervene in a proactive, positive manner to help young people remain abstinent from AOD use (Goldstein & Brooks, 2005; Hawkins et al., 1999; Meschke & Patterson, 2003; Wolkow & Ferguson, 2001). Research into the efficacy of resilience factors in preventing adolescent AOD is in its infancy and there is currently a lack of consensus regarding the definition of resiliency factors, contributing to inconsistency in the research to this point (Wolkow & Ferguson).

This study has also produced mixed results for each of the five independent variables examined. Given the inconsistency of the results, clinicians are advised to not make treatment or other intervention decisions, such as prevention programming, exclusively on this or other resiliency research until several issues are addressed in future studies. First, comparison of resiliency research results would be greatly facilitated by better, more precise operational definitions of individual resiliency activities. As previously discussed, authors differed greatly on what specific activities are included in often broadly defined categories, such as arts and civic activities, for example (Duncan et al., 2002; Eccles and Barber, 2002). There also appears to be inconsistencies in sampling and measurement of resiliency factors. Lastly, it seems likely that there is possibly a great deal of difference in how specific resiliency activities, such as drug and alcohol prevention clubs, may or may not be presented in different school systems and even regions nationally and in other countries (Wolkow & Ferguson, 2001). However, despite that issues that remain unresolved in the resiliency research, the serendipitous findings in this study suggest that non-participation in the examined activities may be associated with increased risk of substance use more often that chance would explain. Clinicians,
therefore, may chose to encourage young people to engage in positive social resiliency factors.

5.6 Recommendations for Future Research

This study was an investigative first step in evaluating the data gathered regarding activities hypothesized to provide some protection against adolescent AOD use using the 2006 ADAS Student Survey (Piazza & Ivoska, 2007). It is suggested that future research focus on refining samples and independent variables in order to obtain more precise and informative results. Samples could be further stratified in terms of school, race/ethnicity, zip code, etc., to obtain more detailed data regarding what populations may obtain benefit from the hypothesized resiliency activities. The independent variables could also be more clearly defined in order to reduce ambiguity and confusion for students regarding what activities are intended for inclusion in each category. Investigation of each activity separately, rather than in a group with the other four, may provide more detailed information for that activity.

Some consideration could also be given to how the independent variables are measured and how this may affect results. For example, on the 2006 ADAS Student Survey, all five of the independent variable questions are measured identically. Although it may be likely that some students would participate in sports or athletic activities almost daily, it is unclear if adolescents can or do participate in drug and alcohol clubs, or even religious activities, that often. A measurement system more in line with realistic time frames for participation in the activities may provide more valuable and precise data. Information regarding how different schools, school districts, and grade levels present and/or promote resiliency activities would be helpful in analyzing the data from the survey. For example, do all schools and school districts have established drug and alcohol
prevention programs? How often and at what grades are these programs presented? This knowledge would be helpful in analyzing how resilience in regard to that independent variable may differ between school, school districts, and grade levels.

More involved research designs may provide more specific information regarding the effect of social resiliency factory on adolescent AOD. Rather than looking at resiliency factor dichotomously, future researcher could examine levels how levels of participation in resiliency factors affect AOD use. A logistic regression design developed to examine interaction and cumulative effects could provide information regarding how participation in multiple social resiliency factors may affect adolescent AOD behavior. Although potentially complicated and time consuming, conducting longitudinal research could aid in determining if AOD by young people is affected patterns of social resiliency participation over time and/or age at initiation of participation in activities.

Lastly, the serendipitous findings in this study suggest that the lack of participation in a theorized social resiliency factor may be associated with substance use more than can be explained by chance alone. Lack of participation, therefore, may be viewed as a risk factor for adolescent AOD. Further investigation of how social resiliency and risk factors are related is another potential future line of research.

5.7 Limitations

There are several sources of survey error that could have negatively affected the validity of this research. First, measurement error may have been present in that respondents may have under- or over-estimate their AOD use. This may have occurred either intentionally or unintentionally. Although the survey was conducted anonymously, participants may have been concerned about confidentiality and consequently not responded accurately. Social desirability may also have been a factor that influenced
some students to minimize their use of drugs and other substances. Non-intentional measurement errors may have resulted from the inability of participants to remember the number of instances of AOD use or make accurate estimates of frequency of AOD use. Additionally, non-response error may have been a factor if some participants were unable to respond because they did not understand all the questions, or were unable or unwilling to complete the survey in the time allowed.

As previously suggested, an undetermined number of students were not present on the day the survey was administered due to illness, truancy, or other reasons. This results in coverage error. It seems reasonable to assume that students who abuse substances are more likely to be absent from school, effectively self-selecting themselves out of the survey. Unfortunately, this may have resulted in an underestimation of the relationship between resiliency factors and substance abuse in this study. Lastly, the results obtained in this study may not be generalizable to adolescents in other geographical areas due to differing socio-economic and demographic factors.

5.8 Conclusion

Adolescent AOD use has been identified as a serious problem in terms of addiction and other negative health effects, mental health problems such as depression, interpersonal problems with family and peers, and injury or death from automobile accidents (Chen et al., 2004). Traditionally, AOD use by young people has been investigated from a risk factor perspective. More recently, some researchers have started to focus on positive resiliency factors that may help adolescents remain abstinent from AOD use (Goldstein & Brooks, 2005; Hawkins et al., 1999; Meschke & Patterson, 2003; Wolkow & Ferguson, 2001).
This researcher used the 2006 ADAS Student Survey (Piazza & Ivoska, 2007) to investigate whether five social resiliency activities included in the survey were significantly associated with adolescent abstinence from cigarettes, alcohol, and marijuana more than would be explained by chance. The independent variables included the hypothesized resiliency factors of sports and athletics, arts and civic activities, religious activities, volunteering and community activities, and participation drug and alcohol prevention clubs. A 2 x 2 Chi square analysis was used to evaluate each of the dependent variables separately in a sample of 1,200 subjects stratified in terms of grade level and gender to be representative of the population.

Results supported previous research that sports and athletic activities may be somewhat protective against use of cigarettes, but not for alcohol, especially in males. Significant results were found for females for arts and civic activities, religious activities, and volunteering and community activities. However, results for males for each of these resiliency factors were negative, with the exception of religious activity and marijuana. Differences in independent variable measurement issues may be factors in the lack of consistency in results. Significance for participation in drug and alcohol prevention clubs was not found for any group or substance. Non-participation in several of the resiliency activities were found to be associated with substance use, especially in females. More information is needed regarding the availability and presentation of such AOD prevention clubs to determine if these results have any validity.

Sampling refinement in terms of more precise demographic stratification and improvement in independent variable measurement could clarify some of the ambiguity found in this study. It should be noted that this study is limited by possible sampling and
response errors inherent in survey research. Results may also not be generalizable to other populations outside northwest Ohio.
References


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Appendix A

2006 A.D.A.S Student Survey
A.D.A.S. Youth Survey

DIRECTIONS
This survey is being given to students in grades 7 through 12. Your answers will be added to the survey to help us learn about students. We hope to discover whether students smoke cigarettes, use alcohol, or use other drugs. We want to hear what you have to say.

This is not a test. You do not have to take this survey. If you do not wish to start the survey, or wish to stop once you have started, that will be all right. No one will be angry with you, nor will you be in trouble.

Please be truthful and honest with your answers. The answers you give cannot be used to identify you. Your answers will not be shown to anyone. No one will know your personal answers to the questions. DO NOT write your name on the survey.

Please read each question carefully before marking your answers. Mark your answers on the answer sheet.

Please mark the responses which describe you best.

1. How old are you?
   A. 11 or younger
   B. 12
   C. 13
   D. 14
   E. 15
   F. 16
   G. 17
   H. 18
   I. 19 or older

2. What is your gender?
   A. Male
   B. Female

3. How tall are you without your shoes on?
   Record your height on the response sheet in the space provided.

4. How much do you weigh without your shoes on?
   Record your weight on the response sheet in the space provided.

5. How do you describe your weight?
   A. Very overweight
   B. Slightly overweight
   C. About the right weight
   D. Slightly underweight
   E. Very underweight

6. Which of the following are you trying to do about your weight?
   A. Lose weight
   B. Gain weight
   C. I am not trying to do anything about my weight

7. How frequently have you smoked cigarettes during the past 30 days?
   A. Not at all
   B. Less than one cigarette per day
   C. One to five cigarettes per day
   D. One to half pack per day
   E. About one pack or more per day

8. How old were you when you smoked a whole cigarette for the first time?
   A. I have never smoked a whole cigarette
   B. 8 years old or younger
   C. 9 to 10 years old
   D. 11 to 12 years old
   E. 13 to 14 years old
   F. 15 to 16 years old
   G. 17 years old or older

9. How old were you when you used marijuana for the first time?
   A. I have never used marijuana
   B. 8 years old or younger
   C. 9 to 10 years old
   D. 11 to 12 years old
   E. 13 to 14 years old
   F. 15 to 16 years old
   G. 17 years old or older

10. How old were you when you drank alcohol (beer, wine, wine coolers, liquor) for the first time?
    A. I have never drank
    B. 8 years old or younger
    C. 9 to 10 years old
    D. 11 to 12 years old
    E. 13 to 14 years old
    F. 15 to 16 years old
    G. 17 years old or older

11. During the last 30 days, have you used smokeless tobacco (snuff, plug, chewing tobacco, dip, etc.)?
    A. Not at all
    B. Once or twice a month
    C. Several times per week
    D. Every day

12. During the last year, on how many occasions have you had alcohol to drink (beer, wine coolers, malt liquor, liquor—more than just a few sips—excluding religious services)?
    A. Never
    B. 1 - 2 times
    C. 3 - 5 times
    D. 6 - 10 times
    E. 11+ times

13. During the last 30 days, on how many occasions have you had alcohol to drink (beer, wine coolers, malt liquor, liquor—more than just a few sips—excluding religious services)?
    A. Never
    B. 1 - 2 times
    C. 3 - 5 times
    D. 6 - 10 times
    E. 11+ times
11. During the last 30 days, on how many occasions have you had five or more drinks in a row (a "drinking binge")? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

12. During the last year, on how many occasions have you used marijuana (grass, pot, weed, blunts, bud, greens)? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

13. During the last 30 days, on how many occasions have you used marijuana (grass, pot, weed, blunts, bud, greens)? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

14. During the last 30 days, on how many occasions have you used powdery cocaine (sometimes called "coke")? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

15. During the last year, on how many occasions have you taken baclofen (Xanax, Valium, rohypnol, roday, klonopin, alprazolam)? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

16. During the last year, on how many occasions have you taken methamphetamine (speed, crystal, MDMA, crack) in order to get high? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

17. During the last 30 days, have you smoked cigars, cigarettes, or little cigars? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

18. During the last year, on how many occasions have you used cocaine (inhalant, nasal, or intranasal)? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

19. During the last year, on how many occasions have you used SNDS or other designer drugs like GHB or roxies, excluding ecstasy? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

20. During the last year, on how many occasions have you used LSD (acid, blotter acid, etc.)? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

21. During the last 30 days, have you used Ritalin, Adderall, or Concerta without a doctor's prescription? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

22. During the last year, on how many occasions have you used Ritalin or Adderall without a doctor's prescription? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

23. During the last 30 days, on how many occasions have you used Ritalin, Adderall, or Concerta without a doctor's prescription? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

24. During the last year, on how many occasions have you used ecstasy (E, XTC)? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

25. During the last year, on how many occasions have you used inhalants (things, people sniffl or inhale to get high)? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

26. During the last year, on how many occasions have you used other designer drugs like GHB or roxies, excluding ecstasy? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

27. During the last year, on how many occasions have you used LSD (acid, blotter acid, etc.)? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

28. During the last year, on how many occasions have you used Ritalin, Adderall, or Concerta without a doctor's prescription? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

29. During the last year, on how many occasions have you used cocaine (inhalant, nasal, or intranasal)? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

30. During the last year, on how many occasions have you used methamphetamine (speed, crystal, MDMA, crack) in order to get high? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

31. During the last year, on how many occasions have you used cocaine (inhalant, nasal, or intranasal)? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  

32. There are a number of painkillers such as oxycodone, vicodin, dermal or percocet. These are prescription medications. During the last year, have you taken painkillers on your own, without a prescription? 
A. Never  D. 6 or more times  
B. 1 - 2 times  E. 11+ times  
C. 3 - 5 times  
D. I don't know
33. During the last 30 days, have you taken painkillers on your own, without a prescription?
   A. Never         D. 6 - 10 times
   B. 1 - 2 times    E. 11 + times
   C. 3 - 5 times

34. If you have alcohol at a party, who provides it?
   A. I don't have alcohol at parties
   B. Older brother or sister
   C. Someone else’s parents
   D. Older friend or relative
   E. My parents

Please answer the following questions with a "Yes" or "No" answer. Be honest with your responses. Remember, your answers will be kept confidential and cannot be connected with your name.

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44. Where do kids your age usually get alcohol (beer, wine, or liquor)?
   A. At my home
   B. At someone else's home
   C. From people on the street
   D. At a store
   E. At school

45. I feel like I am a cheerful, happy person with a positive mood.
   A. Most or all of the time
   B. Often
   C. Occasionally
   D. Almost never

46. I feel positive about my future.
   A. Most or all of the time
   B. Often
   C. Occasionally
   D. Almost never

47. I feel like I can handle my problems and, if not, there are others who can help me.
   A. Most or all of the time
   B. Often
   C. Occasionally
   D. Almost never

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54. How much do you think people risk harming themselves if they smoke cigarettes?
   A. No harm
   B. Some harm
   C. Medium harm
   D. Great harm
   E. Don’t know

55. How much do you think people risk harming themselves if they smoke marijuana?
   A. No harm
   B. Some harm
   C. Medium harm
   D. Great harm
   E. Don’t know

56. How much do you think people risk harming themselves if they drink alcohol (beer, wine, liquor)?
   A. No harm
   B. Some harm
   C. Medium harm
   D. Great harm
   E. Don’t know
57. If you get alcohol from a store, what method do you use to obtain it? (Choose only one answer)
   A. I never get alcohol from a store
   B. I just buy it – the store does not check ID’s
   C. I have someone 21 or older buy it for me
   D. I buy it using a fake ID
   E. I usually take it or steal it from the store

58. Where do kids your age usually get prescription drugs that were not prescribed for them by a doctor?
   (Choose only one answer)
   A. At my home
   B. At someone else’s home
   C. From a friend
   D. At school
   E. I don’t know

59. Where do kids your age usually get marijuana? (Choose only one answer)
   A. At my home
   B. At someone else’s home
   C. From a friend
   D. At school
   E. I don’t know

60. On how many of the past 7 days did you exercise or participate in physical activity for at least 30 minutes that made you sweat and breathe hard, such as basketball, soccer, running, swimming, fast bicycling, fast dancing, or similar aerobic activities?
   A. 0 days
   B. 1 day
   C. 2 days
   D. 3 days
   E. 4 days

61. On how many of the past 7 days did you exercise or participate in physical activity for at least 30 minutes that did not make you sweat and breathe hard, such as fast walking, slow bicycling, skating, pushing a lawn mower, or mopping floors?
   A. 0 days
   B. 1 day
   C. 2 days
   D. 3 days
   E. 4 days

62. On how many of the past 7 days did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?
   A. 0 days
   B. 1 day
   C. 2 days
   D. 3 days
   E. 4 days

63. On an average school day, how many hours do you watch TV, play video games, or sit at a computer?
   A. 1 hour or less per day
   B. 2 hours per day
   C. 3 hours per day
   D. 4 hours per day
   E. 5 hours or more per day
   F. Not at all

64. How often do you wear a seat belt when riding in a car driven by someone else?
   A. Never
   B. Rarely
   C. Sometimes
   D. Most of the time
   E. Always

65. Have you seriously thought about killing yourself in the last year?
   A. Yes
   B. No

66. Have you tried to commit suicide in the last year?
   A. Yes
   B. No

| Table 1: During the school year, how often have you participated in any of the following activities? |
|---------------------------------------------------|---|
| **Never** | **1-2 times per month** | **1-2 times per week** | **Almost Daily** |
| Sports or athletic activities (team sports, football, basketball, track, etc.) dance class, swimming | A | B | C | D |
| Arts or civic activity theatre, band, choir, orchestra, school clubs, honor society, etc. | A | B | C | D |
| Religious activities (going to service church/synagogue activities, belong to church youth groups, etc.) | A | B | C | D |
| Volunteering or community activities (YMCA, scouting, etc.) | A | B | C | D |
| Alcohol and drug prevention clubs in school (like Youth to Youth, PRIDE, Teen Institute, SADD, etc.) | A | B | C | D |

**Thank You!**
We appreciate your help.