

11-9-2016

Risk and Protective Factors Associated with the Adult Achievement of Substance-Using Adolescents: Findings from the National Longitudinal Study of Adolescent to Adult Health

Dana G. Farrell

Florida International University, dfarr004@fiu.edu

DOI: 10.25148/etd.FIDC001257

Follow this and additional works at: <https://digitalcommons.fiu.edu/etd>

 Part of the [Other Social and Behavioral Sciences Commons](#)

Recommended Citation

Farrell, Dana G., "Risk and Protective Factors Associated with the Adult Achievement of Substance-Using Adolescents: Findings from the National Longitudinal Study of Adolescent to Adult Health" (2016). *FIU Electronic Theses and Dissertations*. 2721.
<https://digitalcommons.fiu.edu/etd/2721>

This work is brought to you for free and open access by the University Graduate School at FIU Digital Commons. It has been accepted for inclusion in FIU Electronic Theses and Dissertations by an authorized administrator of FIU Digital Commons. For more information, please contact dcc@fiu.edu.

FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

RISK AND PROTECTIVE FACTORS ASSOCIATED WITH THE ADULT
ACHIEVEMENT OF SUBSTANCE-USING ADOLESCENTS: FINDINGS FROM
THE NATIONAL LONGITUDINAL STUDY OF ADOLESCENT TO ADULT
HEALTH

A dissertation submitted in partial fulfillment of

the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

PUBLIC HEALTH

by

Dana G. Farrell

2016

To: Dean Tomás R. Guilarte
R.Stempel College of Public Health and Social Work

This dissertation, written by Dana G. Farrell, and entitled Risk and Protective Factors Associated with the Adult Achievement of Substance-Using Adolescents: Findings from the National Longitudinal Study of Adolescent to Adult Health, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

Consuelo Beck-Sagué

Jessy G. Dévieux

Wensong Wu

Elena Bastida, Major Professor

Date of Defense: November 9, 2016

The dissertation of Dana G. Farrell is approved.

Dean Tomás R. Guilarte
R.Stempel College of Public Health and Social Work

Andrés G. Gil
Vice President for Research and Economic Development
and Dean of the University Graduate School

Florida International University, 2016

© Copyright 2016 by Dana G. Farrell

All rights reserved.

DEDICATION

“Some men know the value of education by having it. I know its value by not having it.”

-Frederick Douglass

This dissertation is dedicated to my ancestors for whom education was prohibited, and to those who fought for change.

To my husband and children, thank you so much for your support and love during this journey. I love you. To my parents, thank you for providing me with love, always making education a priority, and for never placing limits on who I could become. I appreciate all that you've done for me and I love you.

ACKNOWLEDGMENTS

I would first like to acknowledge the support and expertise of my committee. An intelligent and esteemed group of women who taught and mentored me throughout graduate school and the dissertation process. I have thoroughly enjoyed my experiences with each of you and I thank you for the time you've devoted. My sincere appreciation to Dr. Elena Bastida, my mentor and major professor. Thank you for your consistent optimism, caring nature, and for believing in me throughout this entire journey. To Dr. Consuelo Beck-Sague, thank you for your passion and ability to motivate me to see the bigger picture. To Dr. Jessy Devieux, thank you for your calming personality and unwavering commitment to see me succeed. Finally, to Dr. Wensong Wu, thank you for your patience and for teaching me independence.

Thank you to all of my FIU professors and fellow colleagues whom I have enjoyed getting to know and who taught me lessons that reach beyond the classroom. Thank you also to Dr. Melissa Howard for your kindness and for providing mentorship. Thank you to my mentor and friend, Dr. Calonie Gray for all of your instruction, support, and for having a giving heart. Thank you to my mentee Jamirah Gause, for showing me what it means to grow and succeed. I am so proud of you. Thank you also to everyone at Girl Power, Miami for creating a place where girls can flourish and reach their full potential.

I am very grateful to Dr. Lawrence Morehouse and the Florida Education Fund for affording me the opportunity to study at FIU as a McKnight Doctoral Fellow. Thank you for the practical lessons, the scholarly support, and for the funding to make it all happen. Thank you to the entire Florida Education Fund staff including Charles Jackson,

and Katelyn Sengsoulay, who both went above and beyond to support me throughout this journey. Thank you for everything that you do to foster a sense of family for all McKnights.

Special acknowledgement also goes to ICPSR and the Institute for Social Research at the University of Michigan from which the public-use dataset for the National Longitudinal Study of Adolescent to Adult Health (Add Health), 1994-2008 [Public Use] (ICPSR 21600) was downloaded. In addition, I would like to extend my appreciation to the staff at the Carolina Population Center for statistical guidance throughout my analysis of the Add Health data.

This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (<http://www.cpc.unc.edu/addhealth>). No direct support was received from grant P01-HD31921 for this analysis.

ABSTRACT OF THE DISSERTATION

RISK AND PROTECTIVE FACTORS ASSOCIATED WITH THE ADULT
ACHIEVEMENT OF SUBSTANCE-USING ADOLESCENTS: FINDINGS FROM
THE NATIONAL LONGITUDINAL STUDY OF ADOLESCENT TO ADULT
HEALTH

by

Dana G. Farrell

Florida International University, 2016

Miami, Florida

Professor Elena Bastida, Major Professor

The literature has well-documented the deleterious effect of alcohol and other drug (AOD) use on adolescent development and future outcomes. Despite these devastating results, some adolescents are able to attain high achievement as adults, despite their earlier AOD use.

Secondary quantitative analyses were conducted on nationally-representative data from the National Longitudinal Study of Adolescent to Adult Health. Longitudinal data, collected at Wave I (1994-1995), and Wave IV (2007-2008), were analyzed from a sample of 4,266 American high school students between the ages of 13-19 years. The majority of high school students in the sample self-reported AOD use (n=2,833, 66.4%), compared to those students who self-reported non-AOD-use (n=1,433, 33.6%).

Statistically significant findings indicated that with the exception of household income, non-AOD-using adolescents experienced more favorable outcomes with regard to educational attainment, occupational status, and involvement with the criminal justice

system when compared to their AOD-using counterparts. In addition, through ordinal and binomial logistic regressions, the present study identified risk and protective factors affecting the adult outcomes of adolescents who used AODs. Gender, age, grade level, importance of religion, frequency of prayer, fighting, suspensions, expulsions, and happiness in neighborhood were statistically significant in predicting educational attainment. Grade level and feeling safe in school were found to be statistically significant in predicting occupational status. Gender, fighting, suspensions, and alcohol use by best friends were statistically significant in predicting involvement with the criminal justice system.

TABLE OF CONTENTS

CHAPTER	PAGE
CHAPTER 1	1
INTRODUCTION	1
Public Health Significance	5
Statement of the Problem	7
CHAPTER II.....	10
LITERATURE REVIEW	10
Adolescent AOD Use & Public Health Significance	11
Risk/Protective Factors in Adolescent AOD Use & Adult Outcomes	13
Gap in the Literature	16
Theoretical Framework	18
Life Course Theory	18
Cumulative Advantage/Disadvantage & Ecological Developmental Risk and Protection	21
Individual Risk and Protective Factors & Adult Outcomes	26
Interpersonal Risk and Protective Factors & Adult Outcomes	36
Environmental Risk and Protective Factors & Adult Outcomes	41
CHAPTER III	49
METHODOLOGY	49
Data Source.....	50
Add Health Research Design & Approach	52
Add Health Data Collection.....	54
Construction of Study Panel	58
Outcome Variables-Wave IV.....	59
Predictor Variables-Wave I.....	61
Data Analysis	64
CHAPTER IV	71
RESULTS	71
Wave I Descriptive Statistics	71
Statistically Significant Differences Between Groups-Wave I.....	85
Wave IV Descriptive Statistics	86
Statistically Significant Differences Between Groups-Wave IV.....	95
Ordinal Logistic Regression	100
Binomial Logistic Regression.....	107
CHAPTER V	117
DISCUSSION.....	117
Individual Risk and Protective Factors & Adult Outcomes	120
Interpersonal Risk and Protective Factors & Adult Outcomes	127

Environmental Risk and Protective Factors & Adult Outcomes	129
Conclusion	130
Implications.....	133
Limitations	135
REFERENCES	137
APPENDIX.....	159
VITA.....	175

LIST OF TABLES

TABLE	PAGE
1. Wave I Total Sample Demographic Characteristics for AOD-Using & Non-AOD-Using Adolescents	72
2. Wave I Specific Group Demographic Characteristics for AOD-Using & Non-AOD-Using Adolescents	74
3. Wave I Race/Ethnicity and Gender Characteristics for AOD-Using & Non-AOD-Using Adolescents.....	75
4. Wave I Pan-Ethnic Latino Percentages for AOD-Using & Non-AOD-Using Adolescents	76
5. Wave I AOD Age of Initiation by Drug Type for AOD-Using Adolescents	77
6. Wave I Individual Risk and Protective Factors for AOD-Using & Non-AOD-Using Adolescents	79
7. Wave I Interpersonal Risk and Protective Factors for AOD-Using & Non-AOD-Using Adolescents	82
8. Wave I Environmental Risk and Protective Factors for AOD-Using & Non-AOD-Using Adolescents	84
9. Wave IV Adult Demographic Characteristics for Wave I AOD-Using & Non-AOD-Using Adolescents	87
10. Wave IV Adult Outcomes for Wave I AOD-Using & Non-AOD-Using Adolescents	88
11. Wave IV Adult Outcomes by Race/Ethnicity for Wave I AOD-Using Adolescents	90
12. Wave IV Adult Outcomes by Race/Ethnicity for Wave I Non-AOD-Using Adolescents	92
13. Wave IV Adult Outcomes by Gender for Wave I AOD-Using & Non-AOD-Using Adolescents	94
14. Ordinal Logistic Regression Analyses Predicting Lower Educational Attainment in Wave IV for Wave I AOD-Using Adolescents	103

15. Ordinal Logistic Regression Analyses Predicting Lower Occupational Status in Wave IV for Wave I AOD-Using Adolescents	105
16. Binomial Logistic Regression Analyses Predicting Higher Involvement with the Criminal Justice System in Wave IV for Wave I AOD-Using Adolescents	109
17. Risk & Protective Factors Predicting Wave IV Outcomes for Wave I Non-AOD-Using Adolescents	113

CHAPTER I

INTRODUCTION

Adolescent alcohol and other drug (AOD) use poses a major challenge to the field of public health due to its dangerous effects on adolescent development (Centers for Disease Control and Prevention, 2012). Adolescent drinking, binge drinking, and drug use also threatens the physical health of adolescents (Respress, Small, Francis, & Cordova, 2013), while also negatively impacting their life choices, life course, and adult health outcomes (Berzin, 2010; Modecki, Barber, & Eccles, 2014; Salazar et al., 2004; Schulte, Ramo, & Brown, 2009).

Approximately 1 out of 6 people around the globe is an adolescent (World Health Organization, 2014). Adolescents are defined by the World Health Organization and Healthy People 2020 as those that are between the ages of 10 to 19 years (Healthy People 2020, 2014). Although the majority of these 1.2 billion young people are healthy, a significant number face death, various illnesses, and a myriad of disease each year. From a public health perspective, illness during adolescence can impede proper growth and development, thus leading to stunted health outcomes in adulthood.

Traditionally, the period of adolescence represents a crucial time where alcohol and other drugs (AODs) have been introduced (Beyers, Toumbourou, Catalano, Arthur, & Hawkins, 2004; Hawkins et al., 1997). By the time adolescents reach the 12th grade, 72% have used alcohol, 44% have smoked cigarettes, and 42% have tried marijuana (Johnston, O'Malley, Bachman, & Schulenberg, 2010; Schlauch, Levitt, Connell, & Kaufman, 2013). The result of adolescent AOD use often creates instantaneous problems affecting their health and life activities as well as creating more lasting problems for the

future. In addition, of those adolescents who use AODs, 7.3% between the ages of 12 and 17 will develop substance use disorders (Schlauch et al., 2013; Substance Abuse and Mental Health Services Administration, 2012).

Demonstrating the prevalence of substance use among American high school students are data from the 2015 Youth Risk Behavior Survey (YRBS) conducted by the Centers for Disease Control and Prevention (CDC). The YRBS data shows that 63.2% of adolescents reported ever drinking alcohol in their lifetime, while 32.8% reported current alcohol use which was categorized as having at least one drink in the month prior to the survey (Centers for Disease Control and Prevention, 2016). In addition, 17.7% of adolescents reported binge drinking which was categorized as consuming five or more alcoholic drinks consecutively within a few hours during the month prior to the survey. The data also showed that 38.6% of adolescents reported ever smoking marijuana during their lifetime, while 21.7% reported current marijuana use which was categorized as smoking marijuana at least once in the month before the survey. Second to marijuana use, illegal prescription drug use was reported at 16.8% and includes the drugs Oxycontin, Percocet, Vicodin, Codeine, Adderall, Ritalin, and Xanax. Data for reported lifetime use of other drugs includes 5.2% for cocaine, 6.4% for hallucinogens such as mushrooms, PCP, and LSD, 2.1% for heroin, 3.0% for methamphetamines, and 5.0% for ecstasy.

Although there has been an overall decrease in adolescent alcohol and drug use in recent years (National Institute on Drug Abuse, 2014), cause for concern remains due to their significant effect on the overall quality of life for young people (World Health Organization, 2014). The World Health Organization lists alcohol and drug use as main

concerns for youth in the world, both currently, and for the future. Alcohol use during adolescence is a significant problem in many countries. Adolescent alcohol use lowers inhibitions and hinders self-control, thus leading to injuries, violence, and premature death (World Health Organization, 2014). In addition, when under the influence of AODs, adolescents engage in more risky behavior including unsafe sexual activity, which places them at risk for HIV and other sexually transmitted infections (Yan, Chiu, Stoesen, & Wang, 2007).

In his iconic two-volume work, *Adolescence*, published in 1904, G. Stanley Hall noted the significant changes that occur during adolescence in regard to biological and psychological development (Arnett, 2006; Hall, 1904). More than a century later, Hall's innovative contention that adolescence is a time of turmoil and strain is re-affirmed when examining adolescent life in the twenty-first century (Gilmore & Meersand, 2014). Today's adolescents navigate significant physical, mental, and social changes in their transition to adulthood. The adolescent's triumph or failure within this transition depends on their current resources, unique strengths, and childhood experiences. In addition, they also develop self-concepts which can assist them in the transition toward becoming an adult (Salazar et al., 2004). For those adolescents that are especially vulnerable, this journey becomes even more difficult as it is marred with lost opportunities and increased risks which become even greater as the years pass (Berzin, 2010). In *Adolescence*, G. Stanley Hall also notably described an association between sensation-seeking and risk behavior during adolescence (Arnett, 2006; Hall, 1904). He believed that if an adolescent did not have the opportunity to fulfill his or her need for excitement with constructive activities, then those desires would be satiated by sexual activity and alcohol use.

In regard to public health, adolescence is a key developmental period due to the establishment of patterns in health behavior (National Research Council & Institute of Medicine, 2009). These patterns not only dictate the adolescent's existing health, but also decide their risk for future chronic disease as adults (National Research Council & Institute of Medicine, 2009). Many public health problems in our society begin in adolescence, which is usually a healthy time for most individuals (Mulye et al., 2009). Adolescence is also notably characterized by transition, both biologically and socially. Adolescents themselves are especially vulnerable to change during this time and respond greatly to outside influences from the environment. These environmental aspects include family, peers, school, and community, which can each support or threaten the adolescent's health and safety (National Research Council, 1993). It is for these reasons the period of adolescence is an extremely important phase in the life span (Mulye et al., 2009).

The literature has well-documented the deleterious long-term effects surrounding AOD use in adolescents (Hodgins, Lövenhag, Rehn, & Nilsson, 2014; Kandel, Davies, Karus, & Yamaguchi, 1986; National Center on Addiction and Substance Abuse, 2011). However, despite the devastating outcomes resulting from AOD use, some adolescents are able to attain achievement as adults even though they used AODs earlier in their lifespan (King, Meehan, Trim, & Chassin, 2006). These adolescents are resilient in the face of AOD use and other life stressors. Investigation into their lives allows for a better understanding of the factors involved in their development and transition into adulthood. In the examination into the life trajectories of these accomplished adults, it becomes important to explore both risk (Berzin, 2010) and protective factors which can offer

insight into the formation of destructive behaviors and also provide understanding in the development of effective preventive programs (Brown et al., 2009).

Life Course Theory (LCT) served as the theoretical framework for this study and has been utilized as a framework in numerous fields within social science (Binstock & George, 2011). Based on research conducted in the 1960s and 1970s by Glen H. Elder Jr., Leonard D. Cain Jr., Matilda White Riley, and Norman Ryder, LCT stressed the significant effects of early experiences on subsequent health outcomes and has been used as the principal perspective guiding longitudinal study of health determinants and outcomes (B. Evans, Crogan, Belyea, & Coon, 2009).

Public Health Significance

Millions of Americans of all ages are affected by the use of drugs and alcohol each year (National Institute on Drug Abuse, 2011). In the United States, adolescents, ages 10-19 years represent approximately 14 percent of the population (U.S. Census Bureau, 2014). Substance use by adolescents remains a tremendous public health problem and presents threats to the well-being of millions of youth in the United States (National Center on Addiction and Substance Abuse, 2011). Adolescents are affected by substance use in many ways including the development of mental health conditions, brain damage resulting in cognitive impairment, low school performance, problems affecting sexual and reproductive health, various problems with the criminal justice system, and also death (American Psychiatric Association, 2013).

As with many preventable diseases, those that begin in adolescence are more exorbitant in cost due to their long-term effects on health (Healthy People 2020, 2014).

In addition to the social ramifications which result from substance use, there is also a great financial burden placed on the country. This financial burden exceeds half a trillion dollars yearly due to health costs, costs associated with drug-related crime, as well as loss due to overall declines in productivity (National Institute on Drug Abuse, 2012).

Most of the prominent causes of morbidity and mortality among adolescents and young adults are greatly preventable (Mulye et al., 2009). Organizations which center their efforts on the prevention of adolescent substance use highlight the importance of educating youth on the perilous effects of drugs and alcohol early on (National Institute on Drug Abuse, 2008). These early interventions are suggested mostly due to the fact that the majority of adults with drug and alcohol problems began their use during adolescence. In examining substance interventions for adolescents, the literature shows that it is important to build on those with an individual-level focus (World Health Organization, 2014). Effective interventions will need to take into account the knowledge and abilities of adolescents as well as their physical and social environments. Because adolescent health outcomes are often influenced by their behaviors, incorporating individual, peer, family, school, community, and societal levels in interventions designed to change health behavior is key (Healthy People 2020, 2014). The World Health Organization advises more of a focus on multiple health determinants and a multi-faceted approach to viewing health risk behaviors. Finding the link between these health determinants will be invaluable in stopping the cycle of poor health (World Health Organization, 2014). In addition, greater support is also needed in the areas of parental involvement, school support, and policy-derived programs which safeguard the health of the adolescent.

The present study is significant to the field of public health due to its use of longitudinal data to improve the understanding of the dynamic influences related to adolescent substance use. In examining both risk factors and protective factors of substance-using adolescents, a greater appreciation of the effects of drugs and alcohol on the life course may be obtained. In following the same cohort through adulthood, knowledge will be gained from observing those who were able to realize a level of accomplishment despite using alcohol and/or drugs. Implications in the prevention of adolescent substance use as well as improvements in current substance treatment programs may be extracted from study results.

Statement of the Problem

The purpose of this study was to identify risk and protective factors in substance-using adolescents who had experienced various levels of achievement in adulthood despite layered adversity. Layered adversity in this sense refers to multiple disadvantages which existed in their lives. Risk and protective factors were explored in three overarching areas with seven sub-areas: 1) Individual (gender & race/ethnicity, child maltreatment, internalizing & externalizing behaviors, and religiosity; 2) Interpersonal (family dynamics and peer influence); and 3) Environmental (school & community environment). These seven sub-areas of focus have been identified as important through the literature and while there are hundreds of variables in existence; these seven areas have been determined to be the most pertinent to the topic.

The present study utilized nationally-representative, self-reported data from the National Longitudinal Study of Adolescent to Adult Health (Harris et al., 2009; Kelley &

Peterson, 1997; Pardini, 2011; UCLA, California Center for Population Research, 2015), herein referred to as “Add Health.” Secondary analysis was performed on data collected from a cohort of adolescents who were selected and followed from baseline during the 1994-1995 school year, (Wave I data collection) to adulthood during 2007-2008 (Wave IV data collection). The present study investigated the effects of adolescent AOD use on adult outcomes including educational attainment, occupational status, household income, and involvement with the criminal justice system. In the field of public health, the knowledge gained from this investigation and other life-course studies is invaluable when developing preventive interventions (Schulz & Heckhausen, 1996). In addition, examining the risk and protective factors influencing substance-using adolescents is key in promoting their health and assisting public health professionals in developing treatment interventions (Brown et al., 2009). Establishing positive health behaviors in adolescents is important to society in order to guarantee a future generation of healthy and productive adults (Healthy People 2020, 2014). Current literature on this topic has focused on risk and protective factors associated with adolescent AOD use. These risk and protective factors are important to all areas of the life of the adolescent and affect development surrounding neighborhood and community, family, school environment, peer groups, and individual characteristics (Bond, Toumbourou, Thomas, Catalano, & Patton, 2005).

The present study builds on knowledge gained from the aforementioned studies and also addressed a gap in the literature. There have not been many studies that have utilized longitudinal data to examine the life course beginning in adolescence and viewed later adult educational attainment and career success (Howard & Galambos, 2011). In

addition, those studies which have examined substance usage in adolescence with regard to later adult achievement and economic outcomes, lack a united focus and vary in their findings (Broman, 2009). This study contributes to the literature with a multi-faceted approach to examine the lives of those adults who have experienced educational and occupational attainment despite using substances as adolescents. The present study also focused more specifically on identifying the adolescent risk and protective factors associated with adult outcomes using secondary data derived from a prospective longitudinal study design. Finally, this study utilized Wave I and Wave IV, which is the most recent data from the Add Health dataset. Add Health is the most extensive nationally-representative longitudinal study on adolescent and adult health. This rich dataset produces new and innovative publications each year, further solidifying its relevance and significance in fields including public health, sociology, psychology, criminology, and medicine.

Study Aims

- 1) Compare the adult life outcomes (Wave IV) of AOD-using adolescents (Wave I) with the adult life outcomes (Wave IV) of non-AOD-using adolescents (Wave I).
- 2) Identify risk and protective factors (Wave I) associated with adult educational attainment and occupational status (Wave IV-primary outcomes) in AOD-using adolescents.
- 3) Identify risk and protective factors (Wave I) associated with household income and adult involvement with the criminal justice system (Wave IV-secondary outcomes) in the AOD-using adolescent group.

CHAPTER II

LITERATURE REVIEW

Adolescence

From the Latin word *adolescere*, meaning ‘to grow to maturity’, comes the term ‘adolescence’ (Oxford English Dictionary Online, 2016). Adolescence refers to the period in the lifespan where an individual begins puberty and leaves youth in the pursuit of adulthood. The related term ‘adolescent’ encapsulates this unique time and has been used since the late 1700’s to refer to young people that were transitioning from childhood to adulthood (Marshall, 2014). Throughout adolescence change is an important theme as transformation occurs in the adolescent’s maturing body (Parent et al., 2003). These changes include those related to sexual reproduction (Parent et al., 2003), as well as important brain development (Guerrini, Quadri, & Thomson, 2014). Healthy brain development is especially significant and is shaped by hormones, genetic and environmental influences, as well as experiences in childhood. Each of these influences plays a vital role as adolescents gain more independence, acquire new skills, and expand their peer groups (Sloboda, 2015). During this time, many adolescents also begin to use alcohol and other drugs (National Institute on Drug Abuse, 2008). Adolescent AOD use has a dangerous effect on brain development and other biological changes (Centers for Disease Control and Prevention, 2012). It influences decisions surrounding unsafe sexual activity, violence, and also increases the likelihood of accidents and health problems (Alati et al., 2014; Danielsson, Wennberg, Hibell, & Romelsjo, 2012). In addition, as an important risk behavior (Hair, Park, Ling, & Moore, 2009), AOD use places adolescents in danger of adverse health outcomes throughout their lives. For these reasons,

adolescent AOD use poses a major challenge to the field of public health (Centers for Disease Control and Prevention, 2012).

Adolescent AOD Use & Public Health Significance

Adolescent AOD use is a tremendous public health problem and presents a threat to the well-being of millions of youth in the United States (National Center on Addiction and Substance Abuse, 2011) and around the globe (World Health Organization, 2014). Adolescents are affected by substance use in a multitude of ways including the development of mental health conditions, brain damage, low school performance, issues affecting reproductive health, problems with the criminal justice system, and death (American Psychiatric Association, 2013). While there have been observed declines in adolescent substance use in recent years (National Institute on Drug Abuse, 2014), the issue remains extremely relevant to public health due to its effect on long-term health and social consequences for young people (World Health Organization, 2014). Adolescent AOD use not only effects their current development (Centers for Disease Control and Prevention, 2012), but through poor life choices may also covertly destroy their future life outcomes as well (Berzin, 2010; Brown et al., 2009; Modecki et al., 2014; Salazar et al., 2004).

Results from the 2015 Monitoring the Future Survey show that the most commonly used substance by adolescents is alcohol and it has been for decades (Johnston, O'Malley, Miech, Bachman, & Schulenberg, 2016). By the time graduation from high school occurs, 64% of America's students report having consumed alcohol and 47% report having been drunk. Marijuana is also the most popular among adolescents in

terms of illicit drugs. Although the prevalence of marijuana use is lower when compared to alcohol use. The combined 2015 prevalence rates for 8th, 10th, and 12th grade marijuana use is 23.7%. While this rate has remained relatively stable, attitudes surrounding marijuana use have become more approving and the perception of risk has decreased. Adolescent use rates of any illicit drug other than marijuana in the prior year were 6%, 11%, and 15% for 8th, 10th, and 12th graders respectively. In addition, the prevalence of 12th grade students who had used any illicit drug other than marijuana in their lifetime dropped to one of its lowest at 21%.

Organizations which center their efforts on the prevention of adolescent substance use highlight the importance of educating youth on the dangerous effects of drugs and alcohol early on (National Institute on Drug Abuse, 2008). These early interventions are suggested mostly due to the fact that the majority of individuals with drug and alcohol problems began using during adolescence. Furthering this idea, public health professionals have begun to implement a preventive approach using risk and protective factors (Bond et al., 2005; Hawkins, Catalano, & Miller, 1992; Institute of Medicine (IOM) Committee on Prevention of Mental Disorders, 1994). Researchers are currently focused on identifying these factors and developing a better understanding of how they act to protect or impair developing adolescents (Kington & O' Sullivan, 2001; Stewart, Reid, & Mangham, 1997). Past studies have associated variables such as parenting style, family, environment, peer groups, psychological problems, as well as behavioral problems in adolescence with the later misuse of alcohol (Alati et al., 2014; Ryan, Jorm, & Lubman, 2010) and other substances (Bond et al., 2005). In addition, through research studies the risk and protective factors that have emerged have also included those related

to community, school, family, peer, environment, and individual attributes (Bond et al., 2005). The standard in the field has thus been established through the results from a multitude of longitudinal studies which point to predictors of risky behaviors (Arthur, Hawkins, Pollard, Catalano, & Baglioni Jr., 2002; Hawkins et al., 1992). Identifying risk and protective factors appears to be a promising target for prevention-focused interventions aimed at reducing adolescent AOD use.

Risk/Protective Factors in Adolescent AOD Use & Adult Outcomes

Adolescence is one of the most influential points in the life course and decisions made during this time may substantially affect future health outcomes (Larson & Angus, 2011; Moen, 1997; Williams & Merten, 2014). For troubled adolescents, this period also represents a time where there is great potential for positive change (American Psychological Association, 2002; Public Agenda, 1999). From a prevention standpoint, this time of life must be utilized (Moen, 1997; Williams & Merten, 2014). When creating health interventions, it is important to identify and understand individual risk factors which may develop in early childhood and place children and adolescents at risk for behavioral problems (Cleveland, Feinberg, Bontempo, & Greenberg, 2008; Cooper, Wood, Orcutt, & Albino, 2003). Prevention efforts have been found to be better directed at preventing actual initiation of AOD use in adolescence, rather than addressing the issue after use has begun (Beyers et al., 2004; Spoth, Gyll, & Day, 2002). In improving prevention efforts for adolescent risk behaviors, the utilization of risk and protective factors has been found to be successful (Hawkins et al., 1992; Institute of Medicine (IOM) Committee on Prevention of Mental Disorders, 1994).

The focus of the present study is on the risk and protective factors associated with adolescent AOD use and their effects on later achievement in adult life. The present study does not focus on those risk and protective factors related to adolescent substance abuse and dependence. Researchers have made important distinctions in these areas and have established that the risk and protective factors for AOD use differ greatly from risk and protective factors associated with substance abuse and dependence (Weinberg, 2001). ‘Substance use’ is defined as use that while potentially harmful to an adolescent, does not meet the clinical criteria set forth by the Diagnostic and Statistical Manual of Mental Disorders-V (American Psychiatric Association, 2013). According to the National Center on Substance Abuse and Child Welfare, levels of alcohol and drug use exist on a spectrum that includes substance use, abuse, and dependence (Breshears, Yeh, & Young, 2004). Substance use is characterized by social use of alcohol or other drugs where there are no indications of abuse or dependence. Substance abuse and dependence are presently categorized by the Diagnostic and Statistical Manual of Mental Disorders-V under the umbrella of ‘substance use disorders’, and meet specific clinical criteria (American Psychiatric Association, 2013). These problematic levels of substance use are characterized as being more maladaptive where there are marked impairments in daily functioning which may lead to work, social, interpersonal, or legal problems. Highlighting this distinction further are results from a study conducted by Kendler and Prescott (1998) who found risk factors associated with substance abuse and dependence to be more related to individual biology and genetics compared to substance use which they found to be associated with family and social environmental factors.

Risk and protective factors associated with substance use are important to all areas of the adolescent's life and affect development relating to neighborhood and community, family, school environment, peer groups, and individual characteristics (Bond et al., 2005). Examining the risk and protective factors influencing substance-using adolescents is key in promoting their health and assisting public health professionals in developing treatment interventions (Brown et al., 2009). Risk factors act to predict prospectively the possibility that one will become involved in maladaptive behaviors (Hawkins et al., 1992; Hemphill et al., 2011). Conversely, protective factors are predicted to reduce the possibility that those maladaptive behaviors will emerge and also act to moderate or mediate the effects of risk factors (Garmezy, 1991; Hemphill et al., 2011; Jessor, Turbin, & Costa, 1998).

Through longitudinal research, developmental risk and protective factors have been identified within the interdisciplinary fields of public health, psychology, sociology, and criminal justice (Bond, Thomas, Toumbourou, Patton, & Catalano, 2000; Lewinsohn et al., 1994; Stockwell et al., 2004). Within this research both social and fundamental determinants surrounding adolescent substance use have also been explored (Stockwell et al., 2004). These developmental factors exist during various stages of the life course including adolescence, and are predictive of lasting effects related to healthy adjustment as well as maladjustment in the individual. While the method of using risk and protective factors to predict and also prevent adolescent AOD use has been successful, the use of risk and protective factors is not completely precise due to how each relates and interacts with one another (Case, 2007; Cleveland et al., 2008). There have also been inconsistent study results regarding risk and protective factors and contradictory opinions from

researchers regarding interactions with risk and protective factors and substance use (Cleveland et al., 2008). In addition, due to the fact that there are a limited number of longitudinal studies that explore how risk factors affect the transition to adulthood for vulnerable adolescents (Berzin, 2010), researchers have come to differing conclusions regarding the extent of each of these interactions and how they actually affect each other. Findings surrounding the interaction between variables are also under discussion, thus making consensus difficult. Overall, the majority of researchers consider risk factors more significant to adolescent development than protective factors (Cleveland et al., 2008; Kliewer & Murrelle, 2007; Ostaszewski & Zimmerman, 2006).

While there are thousands of risk and protective factors examined in the literature, the present study will focus on variables of interest which were garnered from the Add Health study (gender & race/ethnicity; child maltreatment; internalizing & externalizing behaviors; religiosity; family dynamics; peer influence; and school & community environment). The Add Health public-use dataset was utilized for the present study and has 5,800 variables (Harris et al., 2009). This dataset has generated an extensive amount of research which has produced many important findings. The present study condensed relevant studies and results to those that are the most salient to predictors and outcomes of the study as well as research questions and hypotheses.

Gap in the Literature

In examining risk and protective factors, there are a myriad of dynamics involved when shaping the life of an adolescent and later adult (Cleveland et al., 2008). One of those dynamics is adolescent AOD use. It has commonly been believed that AOD use in

adolescence would result in adverse outcomes in all areas of adult life (Bentler, 1992; Ellickson, Martino, & Collins, 2004; Friedman, Terras, & Zhu, 2004; Kandel et al., 1986). Although there are also studies that contradict these findings, (Gill & Michaels, 1992; Sampson & Laub, 1993; Uggen & Massoglia, 2004), there are however, not many rigorous studies with empirical findings to support these ideas; nor are there explanative theories which clarify exact outcomes (Newcomb, 1997). Using the Life Course Perspective, Broman (2009) analyzed and synthesized past research on adolescent substance use and adult outcomes and found it rife with inconsistencies. Broman stated, “In summary, the prior literature offers an unclear pattern of results.” (p.133). (Newcomb, 1997), in agreement, also stated that outside of the fatalities each year which are the direct result of adolescent AOD use; many of the adult life outcomes associated with violence, crime, and other adverse consequences are not clearly understood.

The literature is also limited with regard to studies that explore how risk factors interplay with the transition to adulthood for vulnerable adolescents (Berzin, 2010). There are also not many empirical findings of the adult outcomes of adolescent drug use (Newcomb, 1997; Newcomb & Bentler, 1988). Furthermore, there have not been many studies that utilized longitudinal data to examine the life course beginning in adolescence and viewed later adult educational attainment and career success (Howard & Galambos, 2011). Studies are also limited with regard to risk and protective factors for adults that have achieved success despite AOD use in their adolescent years. In addition, there has only been a somewhat small amount of research that investigates adolescent risk behaviors with regard to adult success in the areas of educational attainment and occupation (Hair et al., 2009; Zaff & Michelsen, 2002).

To increase this knowledge it becomes essential to extend longitudinal studies with children, adolescents, and young adults through adulthood (Elder, 1999). More longitudinal studies are also needed that track adolescents through their twenties and thirties in order to gain more of an understanding of protective factors as well as risk factors (Berzin, 2010). Through these studies we can learn more about the risks that lead to negative outcomes for vulnerable youth (D. A. Pardini, Loeber, Farrington, & Stouthamer-Loeber, 2012). In addition, the need for long-term prospective longitudinal cohort studies is essential in order to explore long-term outcomes of adolescent drinking and identify those interventions which are most effective (Marshall, 2014).

In the field of health, it behooves researchers and practitioners to learn from life-course studies when developing preventive interventions (Schulz & Heckhausen, 1996). With this knowledge, health professionals will be more able to improve interventions that promote positive life outcomes. In addition, this information would be imperative when guiding health prevention policy (Newcomb, 1997). The present study builds on past research on the topic of adolescent AOD use and adult outcomes. The results from this study contribute to the literature through a relevant examination of risk and protective factors related to the positive outcomes of adults who used substances as adolescents. These findings emphasize the importance of highlighting strengths and mitigating weaknesses in effective health promotion interventions for adolescents.

Theoretical Framework

Life Course Theory

Life Course Theory (LCT) serves as the theoretical framework for this study and has been utilized as a framework in numerous fields within social science (Binstock &

George, 2011). LCT has stressed the significant effect of early experiences on subsequent health outcomes and has been used as the principal perspective guiding longitudinal study of health determinants and outcomes (B. Evans et al., 2009). Based on work conducted in the 1960s and 1970s by Glen H. Elder Jr., Leonard D. Cain Jr., Matilda White Riley, and Norman Ryder, the perspective was first presented in the 1970s for examining the process of aging and aging as it relates to everyday life. Elder (1974) set the standard within the perspective with his research examining the life course outcomes of adults that grew up during the Great Depression.

The present study uses the biographical paradigm as opposed to the institutional paradigm of LCT in guiding the research (Binstock & George, 2011). The biographical paradigm focuses on patterns in relation to the trajectories and transitions of a person's life as well as on the resulting life outcomes. Within this paradigm the adolescent transitions to adulthood and in doing so their role in society goes from dependent to more independent (Berzin, 2010; Elder, 1998; Shanahan, 2000). The institutional paradigm looks at how societal structures are organized to support norms based on age levels (Binstock & George, 2011). From this perspective, the life course is an integral part of culture and social systems, rules, and policies as well as practices. It is for these reasons that the LCT has found a shared impact within the fields of public health, psychology, sociology, and criminology. The theory is especially applicable to the developmental and social risks and protective factors identified by the fields as affecting outcomes on a long-term scale (Stockwell et al., 2004). Those factors influencing the life trajectories of individuals can be viewed within a context of public health by focusing on health behaviors and outcomes over time (Broman, 2009; B. Evans et al., 2009). Life course

analysis is used frequently in examining the early life events of the individual and their later life trajectories and outcomes (Binstock & George, 2011). In addition to the individual, LCT also examines the collective experience of cohorts (Dannefer, 2003), as well as the effect of shared historic events (Elder, 1994).

In applying the linked lives perspective within the LCT, risk and protective factors emanating from the family, school, peer, community, and individual are used to view the adolescent's life and it is understood that any change or interference in one domain would affect another domain of life as they are all interrelated (Krohn, Hall, & Lizotte, 2009). The present study is consequently interested in those substance-using adolescents who have experienced success in adulthood despite layered adversity. As stated previously, layered adversity refers to multiple disadvantages experienced in their lives. Life Course Theory (LCT) serves to guide this study in the identification of risk and protective factors which have greatly affected the life trajectories of these adolescents (Hutchinson, Matto, Harrigan, Charlesworth, & Viggiani, 2007).

Life Course Theory (LCT) has many strengths for use as a theoretical framework (Hutchinson, 2011). The theory provides an appropriate context when examining human development with regard to history and social change. In addition, LCT allows for the belief in the human being's ability to change and grow. LCT also stresses resilience in humans and the capacity for change through intervention which is key when developing prevention programs. Most importantly, LCT brings attention to social inequalities in health and other areas of society with use of concepts of cumulative advantage and disadvantage. Finally, LCT provides a vehicle to explain the significant effect of early

experiences on later health outcomes which is extremely important when developing health interventions (Binstock & George, 2011).

Cumulative Advantage/Disadvantage & Ecological Developmental Risk and Protection

Cumulative advantage/disadvantage highlights and describes the variations within individuals or groups with regard to opportunity, wealth, and overall position in society (Dannefer, 2003). Cumulative advantage/disadvantage also describes the active progression where advantage or disadvantage systematically builds in individuals or groups over the life span (Dannefer, 1987, 2003; Merton, 1968; O’Rand, 1996; Wilson, Shuey, & Elder, 2007). The actual concept of cumulative advantage/disadvantage was metaphorically born in the 1960s through the labor of scientist Derek Price and sociologist Robert Merton (Dannefer, 2003). In accordance with the concept of cumulative advantage/disadvantage (Merton, 1968), those who have early success experience collective advantage over time while those who have early setbacks experience increasing disadvantage. Price explained the term cumulative advantage statistically in that “success breeds success” (Price, 1976) (p.292), whereas Merton described cumulative advantage as, “The Matthew Effect” which is “...conceived of as a locally ongoing process and not as a single event, the practice of giving unto everyone that hath much while taking from everyone that hath little will lead to the rich getting forever richer while the poor become poorer.” (Merton, 1968) (p.610).

The 1960s brought several groundbreaking theories from sociologists including Glen H. Elder Jr., Leonard D. Cain Jr., Norman Ryder, Matilda White Riley, K. Warner Schaie, and John S. Clausen, who each made significant contributions to the

understanding of aging within society and the life course (Dannefer, 2003). These perspectives and their underlying concepts thus served as the necessary base in analyzing issues surrounding cumulative advantage/disadvantage within both individual and cohort life trajectories. This study utilizes the Developmental Risk and Protection theme of the Life Course Theory which is described in Figure.1. This theme was developed by Glen H. (Elder, 1998) Jr. and Michael J. Shanahan (Elder, 1998; Shanahan, 2000), and was later added it to the theory's four original themes. According to the theory, life events and transitions substantially effect later transitions and events in the life course trajectory which can be protected or placed at risk (Hutchinson, 2011). The new LCT theme incorporates the concepts of cumulative advantage/disadvantage (Merton, 1988), which is sociology-based and ecological developmental risk and protection (Hutchinson, 2011), which is rooted in psychology and centered on resilience. Definitions of the terms resilience are varying (Ahern, 2006) and have been described over the years in vastly different ways depending on the focus of the research being conducted. One of the oldest definitions describes resilience as the ability of some children to recover after exposure to trauma or damaging life situations (Ahern, 2006; Garmezy, 1991). Another definition focuses on success despite impediments in one's life and adverse conditions (Ahern, 2006; Rouse & Ingersoll, 1998). A third definition describes the delicate balance between risk factors and mitigating protective factors which work toward guiding an individual through adversity and toward success rather than failure (Hutchinson, 2011; Vaillant, 2002; Werner & Smith, 2001). All three definitions of resilience discussed relate to the topic of the present study and offer integral pieces to a dynamic puzzle.

In further examination of the theory of cumulative advantage and disadvantage, researchers have used longitudinal studies to examine multiple risk and protective factors involved in topics such as adolescent AOD use, juvenile delinquency, and violence (Arthur et al., 2002). In research investigating adolescent AOD use in the context of cumulative advantage/disadvantage, it is essential to measure multiple risk and protective factors simultaneously in order to accurately predict health outcomes in adulthood. In researching cumulative advantage and disadvantage, the topic becomes intertwined with the sub-theme of ecological developmental risk and protection. Researchers agree that multiple risk factors can be detrimental to an individual much in the way that one could conversely benefit from multiple protective factors (Hutchinson, 2011). Hatch (2005) uses the terms interchangeably in stating the importance of examining adversity and protective factors in fully comprehending disparities related to health. In connection with this thought process, the Cumulative Inequality (CI) theory was developed (Ferraro & Shippee, 2009; Hutchinson, 2011). The CI theory joins both the sociological and psychological philosophies and describes the definition of the hybrid as, “disadvantage increases exposure to risk but advantage increases exposure to opportunity” (p.335).

Life Course Theory (LCT)

Figure. 1

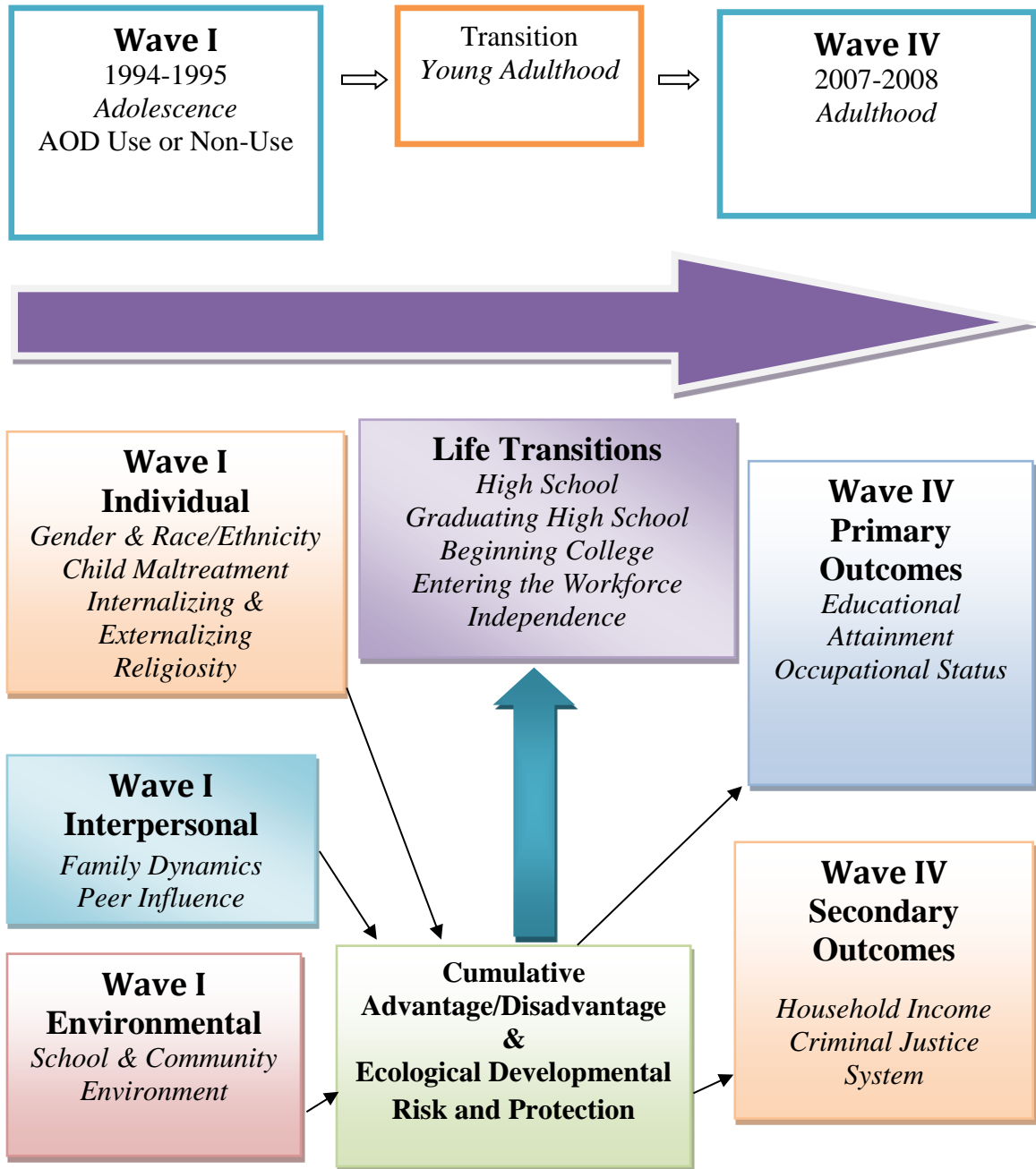
<p>Life Course Theory Ecological Developmental Risk & Protection Theme (Elder, 1998; Shanahan, 2000)</p> <ul style="list-style-type: none"> • Cumulative Advantage/Disadvantage • Ecological Developmental Risk and Protection <p>Life Course Theory Original LCT Themes (Elder, 1994)</p> <ul style="list-style-type: none"> • Interplay of Human Lives and Historical Time • Timing of Lives • Linked or Interdependent Lives • Human Agency in Making Choices
--

Figure.2 describes the conceptual model for the Ecological Developmental Risk & Protection Theme of Life Course Theory which guided the present study. Wave I shows the 1994-1995 school year which was the first time period where the adolescent cohort was surveyed within the Add Health study (Kelley & Peterson, 1997). Adolescents self-reported their AOD use or non-use and this characteristic is shown on the LCT continuum. The transition to young adulthood is then shown which later leads to adulthood and the years of 2007-2008 in which data was collected again from the cohort. At this point on the continuum, each cohort member had reached independence through adulthood. In alignment with LCT, those health determinants from adolescence influenced this phase of the life course (Binstock & George, 2011).

The influence of each individual, interpersonal, and environmental risk and protective factor is then shown to affect the cumulative advantage/disadvantage of each adolescent throughout the life course. Adolescents are thus influenced by *Gender & Race/Ethnicity, Child Maltreatment, Internalizing & Externalizing Behaviors, Religiosity, Family Dynamics, Peer Influence*, as well as *School & Community Environment*. In a similar sense the concept of ecological developmental risk and protection also fits into the model to represent the negative and positive influences on the life transitions of the adolescent throughout his or her high school career, graduation from high school, (Hutchinson, 2011) transition into college, and later entry into the workforce as an independent adult. Throughout these transitions, the ability of the adolescent to thrive determines the success they will have in regard to their adult outcomes (Hutchinson, 2011; Vaillant, 2002; Werner & Smith, 2001). The more risk factors an adolescent faces during the life course, the harder it will be to succeed. By contrast, more protective

factors promote positive achievements in the study outcomes of *Educational Attainment, Occupational Status, Household Income, and Involvement in the Criminal Justice System.*

Life Course Theory (LCT) Ecological Developmental Risk & Protection Theme Conceptual Model
Figure. 2



Individual Risk and Protective Factors & Adult Outcomes

Race/Ethnicity & Gender

Previous studies have found that drug and alcohol use rates were higher among adult men when compared to women (Kuhn, 2015; Merline, O'Malley, & Schulenberg, 2004; Substance Abuse and Mental Health Services Administration, 2014), white adolescent males and females when compared to other races (Chen & Jacobson, 2012) and white adolescent males when compared to females (Patrick & O'Malley, 2015; Stone, Becker, Huber, & Catalano, 2012). When examining further racial and gender differences in substance use, Hispanic adolescents have demonstrated the greatest prevalence for the highest use at the youngest ages (Patrick & O'Malley, 2015) and African American adolescents have had the lowest use across the country when viewing drug and alcohol rates (Chen & Jacobson, 2012; Keyes et al., 2015; Patrick & O'Malley, 2015).

Drug use differences between the genders are especially evident when examining data from 12th graders (Patrick & O'Malley, 2015). Male adolescents have traditionally used drugs more often and at greater rates when compared to their female peers. In addition, adolescent males have also been found to drink more frequently and in greater quantity (Stone et al., 2012). However, in recent years, researchers have seen the gap between male and female substance use during adolescence become smaller and smaller. For various reasons, female adolescents are catching up to their male counterparts and are increasing substance use in both frequency and quantity. Chen and Jacobson (2012) found female adolescents in their study to have higher rates of substance use when compared to their male peers. This difference however, decreased over time in moving

toward young adulthood where males more consistently exhibited substance use at higher rates. Mahalik et al., (2013) utilized longitudinal data from the Add Health study and found that male adolescents and young adults were the most heavily involved in more risk behaviors over time than their female peers. In a similar study, Mahalik, Lombardi, Sims, Coley, and Lynch (2015) also examined Add Health data and found male gender in adolescence and young adulthood to be associated with 31% higher levels of alcohol intoxication and greater increase in marijuana use over time when compared to female peers.

When examining substance use and gender on adult outcomes, researchers have achieved varied results. Staff, Patrick, Loken, & Maggs (2008) utilized data from the National Child Development Study and found that heavy alcohol use in adolescence had a negative effect on adult educational attainment for men but not women, while Garcia (2012) utilized a sample from the Add Health database and found that heavy episodic drinking did not predict negative educational attainment outcomes in adulthood for either gender. Broman (2009) also analyzed data from the Add Health Study and found no differences in regard to the effects of gender and substance use on socioeconomic achievement. In addition, researchers found illegal drug use in adolescence to have a negative impact on adult outcomes, whereas alcohol use was actually consistent with more positive socioeconomic achievement outcomes. Schuster, O'Malley, Bachman, Johnston, and Schulenberg (2001) analyzed data from Monitoring the Future Study and found moderate to heavier levels of marijuana use in adolescence to have a negative effect on occupational attainment for males. For females, while adolescent marijuana use sometimes showed an adverse impact on occupational attainment, results were not

consistently negative as they were for males. Finally, Green, Doherty, Stuart, and Ensminger (2010) utilized a sample of African American adults in the Woodlawn Study to examine the effects of heavy adolescent marijuana use on adult contact with the criminal justice system. Researchers found that heavy marijuana users were more likely to be male, have no male parent in the household, exhibit conduct problems, have higher delinquency as well as more aggressive behavior, and have begun marijuana use before the age of 15. Researchers also found the relationship between heavy marijuana use and high school attrition to be significant. In addition, heavy marijuana users were also found to be more than twice as likely to be arrested for drug-related crimes and 1.7 times more likely to sell drugs as adults.

Age of Initiation

The literature on the topic of early onset alcohol use as a predictor of adult alcohol problems is extensive (Buchmann et al., 2009; Grant & Dawson, 1997). Early age of initiation to AODs in adolescence has been found to be a strong predictor of later adult AOD misuse (Hawkins et al., 1997, 1992; Liang & Chikritzhs, 2015; Merline et al., 2004). In addition, research has shown that adult substance use problems are associated with earlier adolescent use of the same substance (Stone et al., 2012). Age of initiation has also been found to be a strong risk factor for adverse effects related to later substance use (Substance Abuse and Mental Health Services Administration, 2014). According to Morean et al. (2014), understanding age of initiation with regard to adolescent AOD use is imperative in addressing prevention initiatives.

Moreover, King and Chassin (2007) found early initiation of substance use before the age of 13 to be associated with young adult drug dependence. Adolescents in the study were found to be 3 times more likely to have a drug problem as a young adult than their non-using peers. Similarly, in their 2006 study, Lessem et al. found that early use of marijuana by adolescents was associated with the use of harder drugs in young adulthood. In accordance with previous “gateway drug” research and theories, researchers also found marijuana users to be twice as likely to use illicit drugs at young adulthood when compared to non-users.

In addition to the development of adult alcohol and drug problems, Odgers et al. (2008) found early onset of AOD use to be associated with other adverse outcomes in adulthood. Researchers analyzed longitudinal data taken from the Dunedin Multidisciplinary Health and Development Study. Results showed that participants who used AODs at ages 13 and 15 were more likely to have poor educational attainment and have had involvement with the criminal justice system at age 32. Similarly, Horan and Widom (2015) also found adolescents who began using alcohol and drugs at early ages were more likely than those who had not to have problems with alcohol and drugs and greater arrests in adulthood. In a related study, King, Meehan, Trim, and Chassin (2006) examined the relationship between adolescent substance use and young adult educational attainment. Researchers found that while adolescent alcohol and drug use did not prevent college attendance; those AOD-using adolescents were more likely than their non-using peers to drop out of college without obtaining a degree.

Child Maltreatment

As a risk factor, child maltreatment has been associated with both adolescent and adult substance use, psychological disorders, involvement in the criminal justice system, and other undesirable outcomes (Bergen, Martin, Richardson, Allison, & Roeger, 2004; Brand, King, Olson, Ghaziuddin, & Naylor, 1996; Fergusson, Boden, & Horwood, 2008; Hussey, Chang, & Kotch, 2006; Kerr et al., 2009; Lo & Cheng, 2007; Watts & McNulty, 2013). The association between child maltreatment and its deleterious effects on the life course have mostly been established by researchers in the fields of public health and psychology (Watt, David, Ladd, & Shamos, 1995; Watts & McNulty, 2013). In addition, the literature has also shown that child maltreatment affects individuals adversely and results in undesirable health consequences (Huang et al., 2011; Kerr et al., 2009; Molnar, Buka, & Kessler, 2001). The research of Kerr et al., (2009), however, demonstrates the fact that there are varied findings in the literature surrounding this topic. Kerr et al. conducted their 2009 study using data from the At-Risk Youth Study (ARYS), a prospective longitudinal study examining injection drug use initiation in youth who have lived on the streets of Vancouver, Canada and found that sexual abuse in childhood was not found to be associated with initiating injection drug use in this sample of street youth.

Conversely, in a study examining childhood sexual abuse, substance use, and antisocial behavior among adolescents in South Australia; Bergen et al., (2004) found the opposite. Researchers utilized data from a prospective study originating from the South Australian Early Detection of Emotional Disorders Program (EDED) and found that when compared to those adolescents that had not experienced sexual abuse; adolescents that had been sexually victimized were more likely to use alcohol, marijuana, opiates, and

other illegal drugs. Similarly, Shin, Edwards, and Heeren (2009) examined the effect of child maltreatment on adolescent binge drinking in a sample of adolescents from the Add Health database. In accordance with other research on the topic, researchers found that 12.4% of adolescents who reported child maltreatment, also reported binge drinking. In comparison, 9.9% of adolescents who had not experienced child maltreatment reported binge drinking thereby re-solidifying child maltreatment as an essential risk factor (Enoch, 2006). In a related study, Kilpatrick et al. (2000) also found those adolescents who had been victimized to be more likely to begin substance use at an earlier age than those adolescents who had not.

When gender is also examined, adolescent males exposed to sexual abuse in childhood have been found to exhibit more externalizing behaviors such as violent outbursts (Hornor, 2010; Mullers & Dowling, 2008) and fighting, whereas adolescent females exhibit more internalizing behaviors including depression and eating disorders. Overall, researchers believe that as a result of childhood sexual abuse in both adolescent boys and girls, there is a marked increase for the use of drugs and alcohol (Bergen et al., 2004; Hornor, 2010). Similarly, Watts and McNulty (2013) used data from the Add Health study to explore gender in the relationship between child maltreatment and future criminal behavior. Researchers found that in both boys and girls, childhood abuse significantly increased the likelihood that an adolescent would engage in criminal behavior. In accord with Watts and McNulty (2013), Bergen et al. (2004) previously found sexual abuse in childhood to be significantly associated with antisocial behavior in adolescence for both boys and girls. Finally, a related study by Cecil, Viding, Barker, Guiney, and McCrory (2014) showed the detrimental nature of multiple risk factors

combined with child maltreatment. Researchers found an increase in levels of anger in a sample of adolescents and young adults residing in an urban neighborhood when child maltreatment was combined with exposure to community violence.

Internalizing & Externalizing Behaviors

Within the investigation of individual risk and protective factors, there has been a significant research focus on both internalizing and externalizing factors (Schlauch et al., 2013). Internalizing and externalizing problems in childhood have also been shown to affect outcomes in adolescence and adulthood (Colman et al., 2009; von Stumm et al., 2011). In their 2007 study, Sourander et al. studied the relationship between externalizing conduct problems and internalizing problems utilizing data from the “From a Boy to a Man” prospective longitudinal study. Researchers identified a group of boys from the total sample which exhibited both externalizing conduct problems and internalizing problems. Researchers found that 48% of these boys later committed a crime and 32% had been diagnosed as having a mental disorder. In a related study, Reef, Diamantopoulou, Meurs, Verhulst, and Ende (2011) examined data from a 24-year prospective, longitudinal study and also found that adults who exhibited externalizing behaviors as children were at risk for adverse outcomes including exhibiting disruptive behaviors in their adult lives. In accordance with Reef et al. (2011), Maggs, Patrick, and Feinstein, (2008) also found externalizing behaviors to be associated with having more problems in both adolescence and adulthood. Additionally, in a related study, Herrenkohl et al. (2010) showed the damaging nature of multiple risk factors combined with externalizing behaviors. Researchers examined data from the Seattle Social

Development Project (SSDP) and found that family adversity, risk-taking, and conduct problems in childhood and adolescence were significantly correlated with conduct problems, depression, and other health risks in adulthood. Lemos and Faísca (2015) also examined combined risk factors in male juvenile offenders and found that childhood conduct problems were associated with internalizing disorders at adolescence.

The influence of internalizing and externalizing disorders on adult outcomes such as educational attainment and socioeconomic achievement are also of importance when viewing risk factors. Veldman, Bultmann, Almansa, and Reijneveld (2015) examined childhood adversity and educational attainment in adulthood and found that for boys, externalizing problems were predictive of unemployment, high school attrition, and a mediator for low educational attainment in adulthood. Tabler and Utz (2015) also found that in adolescent girls, internalizing behaviors such as eating disorders and disordered eating behaviors were significantly associated with low educational attainment and low personal incomes.

Researchers have also found that individual risk factors such as cognitive and emotional regulatory impairments as well as early behavioral concerns may be linked to later rebelliousness and sensation-seeking behavior during adolescence (Cleveland et al., 2008; Garavan & Stout, 2005). Adolescents are thus sensitive to AOD use because of a perceived high-reward and low-risk thought process. In addition, the presence of severe behavioral and emotional problems in childhood and adolescence also places individuals at risk for problems with substance use (Greenbaum, Prange, Friedman, & Silver, 1991; S. King, Iacono, & McGue, 2004; Malowsky, Schulenberg, & Zucker, 2014; Marshall, 2014; Schlauch et al., 2013) and more specifically drinking alcohol at an earlier age

(McGue, Iacono, Legrand, Malone, & Elkins, 2001; Schlauch et al., 2013). In addition, children with conduct disorder and oppositional defiant disorder were especially at risk and more likely to use alcohol, nicotine, and marijuana collectively (S. King et al., 2004; Schlauch et al., 2013).

Internalizing factors such as depression and anxiety have been found to differ from externalizing factors in that their relationship to early substance use is not as clear. Findings on the topic are varied with some researchers finding significant associations between internalizing factors and adolescent substance use (S. King et al., 2004; Marmorstein & Iacono, 2001) and other researchers finding no relationships between the variables (Bardone et al., 1998; Rao, Daley, & Hammen, 2000).

Religiosity

The literature confirms religiosity as a protective factor guarding youth against negative health outcomes (Barton, Snider, Vazsonyi, & Cox, 2014; Hayatbakhsh, Clavarino, Williams, & Najman, 2014; Wongtongkam, Ward, Day, & Winefield, 2014). Religiosity has also been found to lower other risk factors while increasing protective factors in adolescents (Jang et al., 2008). Kim-Spoon, Farley, Holmes, and Longo (2014) examined data from the Youth Healthy Development Project (YHD) and found religiousness to be a protective factor for adolescents in the study. Similarly, Barton et al. (2014) examined the relationship between parents' religiosity and student health outcomes and found that more negative adolescent health outcomes were associated with lower parent and adolescent religiosity. In addition, adolescent religiosity was found to be a mediator between parent religiosity and adolescent health outcomes partly due to the

fact that parental religious behaviors were taught to the adolescent, thus creating higher religiosity in the adolescent themselves.

In Thailand, Wongtongkam et al. (2014) examined risk and protective factors surrounding alcohol and drug use in a sample of adolescents from the Communities That Care Youth Survey. Researchers found that adolescents who were religious had a strong moral belief system and were less likely to use alcohol or binge drink. Gryczynski and Ward (2012) also found lower odds of heavy alcohol use in adolescents that had stronger religious beliefs. Similarly, Hayatbakhsh, Clavarino, Williams, and Najman (2014) examined maternal and adolescent's religiosity and found that both predicted lower risk of early initiation of substances as well as their frequent use in adolescence.

Adolescent's own religiosity however, was shown to be more significant in the model than parent's religious practices (Bremner, Burnett, Nunney, Ravat, & Mistral, 2011; Marshall, 2014). In addition, Salas-Wright, Vaughn, Hodge, and Perron (2012) examined the relationship between religiosity, substance use, violence, and delinquency in adolescents and found religious adolescents to be less likely than their non-religious peers to use alcohol and marijuana. Religious adolescents were also less likely to fight and steal when compared to other adolescents that were not religious.

Social aspects of religiosity have also been found to be important in acting as a protective factor against substance use (Mason, Schmidt, & Mennis, 2012). Mason et al. (2012) found that higher frequency in adolescent-attendance of worship services and religious activities as well as observed support from the congregation was associated with lower marijuana use. In addition, living within close proximity to places of worship was associated with lower alcohol use. In a related study, Bartkowski and Xu (2007) found

the strongest protective relationship with those adolescents that were not only religious, but were actively attending worship services, participating in school and community programs, and had a trust in other humans. Similarly, Dohn, Mendez, Pozo, Cabrera, and Dohn (2014) found increased worship service attendance to be associated with delayed age of initiation with regard to alcohol consumption in adolescents living in the Dominican Republic. In addition, more frequent church attendance was also associated with a decrease in current drinking, less binge drinking and less inebriation among adolescents.

Interpersonal Risk and Protective Factors & Adult Outcomes

Family Dynamics

Interpersonal risk and protective factors for AOD use are those factors in which the adolescent is influenced and affected by relationships with others such as family members and peers. Research on the family dynamic shows that the nature and quality of the family relationship, level of family involvement, and environment are important to understanding both the risk and protective influence (Epstein, 2009; Schlauch et al., 2013). On a basic level, being a part of a family with parents living separately has been found to be a risk factor for adolescent substance use (Kepper, van den Eijnden, Monshouwer, & Vollebergh, 2014). Protective factors appear to be based on the presence of solid relationships with parents as well as spending time together doing family activities (Wang, Matthew, Bellamy, & James, 2005). Having a communicative relationship with parents that is open and regularly occurs is also seen as being protective for adolescents (Stronski, Ireland, Michaud, Narring, & Resnick, 2000). Another protective factor includes having a family that provides emotional support to the

adolescent (Marta, 1997). In addition, active parental monitoring (Kosterman, Hawkins, Guo, Catalano, & Abbot, 2000) and living in a family where there are rules in place surrounding substance use (van der Vorst, Engels, Meeus, Dekovic, & Van Leeuwe, 2005) have both been found to be protective against adolescent AOD use.

When examining the influence of family on adolescent alcohol use, risk factors included living in a home where alcohol was easily accessible, as well as having positive expectations of alcohol (Bremner et al., 2011; Marshall, 2014). Reeb et al. (2015) utilized data from the Add Health study and found despite differences in race/ethnicity, family SES, gender, age, and baseline alcohol-related problems, family cohesion was inversely associated with alcohol-related problems in adolescence and acted as a protective factor. In addition, family cohesion as a protective factor was much stronger for white adolescents than for black adolescents. There was no association observed for Latino adolescents. Similarly, Resnick et al. (1997) also analyzed data from the Add Health study and found family connectedness to be protective against adolescent AOD use (Kington & O' Sullivan, 2001).

Also utilizing data from Add Health, Broman, Reckase, & Freedman-Doan (2006) studied the effect of having a warm and accepting, authoritative parenting style on adolescent drug use. Researchers found that when compared to Black and White youth, Latino adolescents were the most influenced by parental warmth and acceptance with regard to the reduction of drug use. Similarly, in longitudinal studies conducted by Brody and Ge (2001), as well as Duncan, Duncan, Biglan, & Ary (1998), parenting that was harsh and inconsistent, filled with conflict, or by contrast, lax, was found to be associated with alcohol use in adolescents (Alati et al., 2014). Similar to findings

discussed previously by Broman et al. (2006), researchers have also found that an authoritative parenting style acts to protect the adolescent from a multitude of risk behaviors (Lohaus, Vierhaus, & Ball, 2009; Viner, Ozer, Denny, Marmot, & Resnick, 2012).

Overall, family dynamics during adolescence act as an important predictor for future outcomes throughout the life course (Viner et al., 2012). The extent of the family's connection to one another is vital in protecting adolescents from negative adult health and social outcomes (Resnick et al., 1997; Viner et al., 2012). Adolescents who believe they have a strong connection to their families are less likely to use AODs than those who do not. In addition to connectedness, family stability in childhood and adolescence has also been shown to act as a significant predictor of adult involvement with the criminal justice system (Mednick, Baker, & Carothers, 1990). Moreover, poor parental interaction and low supervision was also associated with both juvenile delinquency and adult criminality (McCord, 1991). Similarly, in examining family dynamics and criminality in early adulthood, Klein, Forehand, Armistead, and Long (1997), found that high conflict between parents as well as low communication, poor problem-solving skills, and depressed mood in the adolescent's mother were predictive of high levels of arrests and convictions. Researchers also found parental divorce to be associated with high rates of criminality. In a related study, Lemos and Faísca (2015) found the absence of a father figure to be associated with posttraumatic stress disorder (PTSD), thoughts of suicide, and suicide attempts in juvenile offenders. Finally, Maggs et al. (2008) found higher alcohol usage in adolescence and adulthood, to be associated

with multiple risk factors including childhood social maladjustment, discord in family life, and truancy behavior.

In examining the effect of family dynamics on educational and economic status in adulthood, the literature is mixed (Gruber, 2004; Lang & Zagorsky, 2001; Lopoo & Deleire, 2014). Researchers have found that low adult educational attainment and low household income is associated with family structures without both biological parents (Gruber, 2004). Conversely, studies conducted by other researchers such as Lang & Zagorsky (2001) showed the opposite in their findings. Their results demonstrated that there was no significant relationship between single-parent family structure and negative outcomes surrounding education and economic security.

Peer Influence

While the influence of the family is quite significant for the adolescent, the timing of the influence may be important as well (Cleveland et al., 2008). Within adolescence there is a shift towards greater independence and interests move more to peers as opposed to family (Bremner et al., 2011; Marshall, 2014). Researchers have found that the influence of the family as a risk or protective factor is stronger for younger adolescents while older adolescents are more influenced by peers (Cleveland et al., 2008). In addition, during the period of adolescence itself, there are more high-risk behaviors such as substance use and sexual activity, which adolescents engage in more if they are associated with peers that are also involved in these behaviors (Gardner & Steinberg, 2005; Marshall, 2014). Positive peer influences are also strong during this time and have been found to increase resilience (Enoch, 2011; Fergusson, Woodward, & Horwood,

1999). In observing the effects of peer influence on adolescent substance risk, peer and individual risk factors were more strongly associated with adolescent use compared with family factors.

When examining peer risk and protective factors, research has shown that when controlling for both environment and individual factors, adolescent substance use is most strongly associated with peer substance use (Hicks et al., 2014). Additionally, Cleveland et al. (2008) found adolescents in grades 10 and 12 to be especially influenced by peers and this influence was associated with lifetime use of both marijuana and alcohol. In addition to these findings, researchers also note that those adolescents who are already using AODs (Roberts & Caspi, 2003; Roberts & Wood, 2006) will find peers that are similarly deviant, thus reinforcing the behavior (Dishion & Owen, 2002; Hicks et al., 2014; Piehler, Veronneau, & Dishion, 2012). Wongtongkam et al. (2014) found adolescents who had friends that used drugs were more likely to use drugs themselves, especially marijuana. In addition, having delinquent friends was also strongly correlated with alcohol and heroin use.

Rees and Wallace (2015) examined the influence of friends that drink alcohol and friends that do not drink on a sample of adolescents from the Add Health dataset. Researchers found that non-drinking adolescents were significantly more likely to begin drinking when in a group of friends that were drinkers. However, having a non-drinking friend can influence drinking behavior even when the majority of friends are drinking. Finally, adolescents with the same number of friends who were drinkers and abstainers, lowered their own odds of drinking onset by half. In a related study, Lynch, Coley, Sims,

Lombardi, and Mahalik (2015) also utilized data from the Add Health study and found that when social norms surrounding adolescent alcohol use from parents, friends, and schoolmates were compared, school mates drinking had the strongest predictive effect. Mundt (2011) also examined adolescent drinking behaviors related to peer social networks with the Add Health dataset and found peer alcohol use to be associated with alcohol use initiation by adolescent respondents. Similarly, Tucker, de la Haye, Kennedy, Green, and Pollard (2014) examined peer influence on marijuana use with the Add Health dataset and found students' marijuana use was influenced more by close and trusted friends in one school, while in the other school, students were influenced by those students that they perceived as more popular.

In addition to substance use, deviant peer association has been attributed to adult anti-social behavior as well as criminality (Huesmann, Eron, & Dubow, 2002). In therapeutic approaches to treat juvenile delinquency and prevent adult criminality, it is imperative to eliminate the influence of deviant peers (May, Osmond, & Billick, 2014). In addition, early initiation into adolescent delinquency has also been found to be associated with relationships with greater peer delinquency as well as adult criminality (S. Z. Evans, Simons, & Simons, 2016).

Environmental Risk and Protective Factors & Adult Outcomes

School & Community Environment

Environment plays a key role in the influence of risk and protective factors contributing to adolescent substance use (Hicks et al., 2014). Researchers view environmental variables as interacting with the adolescent, as opposed to influencing the

adolescent in an external process. Researchers also believe that it is important to identify individual-level risk factors in the adolescent and pay attention to the interaction of those factors with their environment when investigating the development of substance use (Hicks et al., 2014). In examining environmental factors protecting the adolescent against lifetime AOD use, community cohesiveness was found to have the strongest association in the model for younger adolescents as opposed to those that were older (Cleveland et al., 2008). Influences surrounding community were also viewed in a related study where low neighborhood stress was found to increase resilience in adolescents (Enoch, 2011; Jaffee, Caspi, Moffitt, Polo-Tomas, & Taylor, 2007). By contrast, researchers in another study found high neighborhood crime rate and high concentration of low-income households to be associated with AOD risk factors including externalizing disorders in boys (Luthar & Cushing, 1999).

Similarly, Bryden, Roberts, Petticrew, and Mckee (2013) examined 48 studies in a meta-analysis examining various community characteristics and their effect on adolescent alcohol use. In investigating the association between socio-economic characteristics of a community and alcohol use researchers found mixed results among the studies. Some findings demonstrated more adolescent drunkenness in higher socio-economic communities (Reboussin, Preisser, Song, & Wolfson, 2010) and others showed more alcohol use for boys in communities with high rates of unemployment (Svensson & Hagquist, 2010). In addition, in similar studies examining community disorder and adolescent alcohol use, researchers also found more frequent adolescent alcohol use in communities where there were higher rates of drug activity (Abdelrahman, Rodriguez, Ryan, French, & Weinbaum, 1998). In addition, stress experienced by adolescents due to

crime and disorder in their community was similarly associated with higher levels of alcohol use (Scheier, Botvin, & Miller, 1999).

With regard to school environment, Vogel, Rees, Mccuddy, and Carson (2015) utilized data from the Add Health study and examined adolescent AOD use within a school context. Researchers found that school connectedness acted as a moderator between peer network status and marijuana use. Results were consistent with previous findings which highlighted the influence of both peers and school context within drug prevention. Similarly, research conducted by Resnick et al. (1997) also utilized data from the Add Health study and showed school connectedness to be protective against substance use for adolescents. Conversely, it has also been shown that improving protective factors for adolescents within a community, can have a direct impact on school commitment (Dekovic et al., 2011). In addition, higher levels of adolescent school commitment have also been shown to reduce substance use (Wongtongkam et al., 2014), weaken detrimental connections to deviant peers (Dekovic et al., 2011; Stouthamer-Loeber, Wei, Loeber, & Mastenb, 2004), increase educational attainment in adulthood, and also reduce criminality.

Multiple Risk/Protective Factors & Cumulative Advantage/Disadvantage

When examining adverse outcomes, researchers have found a stronger association with the number of risk factors an adolescent possesses compared to what those actual risk factors are (Arthur et al., 2002; Sameroff, Bartko, Baldwin, Baldwin, & Siefer, 1998). Newcomb & Felix-Ortiz (1992) also found that numerous risk factors increased an adolescents risk for negative outcomes (Bond et al., 2005). In a related study, Bond et

al. (2005) found that depression in adolescents was associated with experiencing multiple risk and protective factors in and of itself, regardless of specific type. Similarly, Dong et al. (2004) found that those adolescents who had experienced multiple risk factors earlier in life had also been exposed to several stressors (Enoch, 2011). In addition, Newcomb (1997) also believed adolescent AOD use was attributed to multiple risk factors as opposed to one risk factor in particular and that the total number of risk factors would be key in predicting negative outcomes. In their 2014 study, Aebi, Giger, Plattner, Metzke, and Steinhausen studied the trajectory toward adult criminality from adolescence and found the existence of numerous adolescent risk factors predictive of crime in young adulthood. Bernat, Oakes, Pettingell, and Resnick (2012) examined data from the Add Health study and found the interaction of numerous risk and protective factors to be crucial to the development of violent behavior in young adults. Lastly, Hair et al. (2009) studied the co-occurrence of risky behaviors among adolescents with data from the 1997 National Longitudinal Study of Youth and found the higher the risk behaviors the more negative the impact on adult outcomes. The following studies serve as examples to demonstrate the detriment of multiple risk and protective factors on the individual, interpersonal, or environmental level.

Conclusion

In conclusion, AOD use in adolescence has been identified as a major area of concern in public health (Centers for Disease Control and Prevention, 2002; Hawkins, Catalano, & Arthur, 2002). As demonstrated by data from the Monitoring the Future Survey as well as other national data on adolescent substance usage, adolescent AOD use threatens the health and well-being of millions of youth in the United States (Johnston et

al., 2016; National Center on Addiction and Substance Abuse, 2011). According to the World Health Organization, adolescent AOD use continues to be a major threat to public health in the United States and around the world due to its influence on adolescent development as well as current and future health problems (World Health Organization, 2014). In addition, adolescent AOD use is one of six preventable behaviors that greatly affects adult health as well as other social and educational outcomes over the life course (Centers for Disease Control and Prevention, 2002; Hawkins et al., 2002).

The period of adolescence has been recognized as a significant time with unlimited potential in regard to improving health conditions (American Psychological Association, 2002; Public Agenda, 1999). Establishing positive health behaviors in American adolescents is important to society in order to guarantee a future generation of healthy and productive adults (Healthy People 2020, 2014). As in the present study, data from longitudinal studies are being utilized to assist public health professionals in better understanding the dynamics involved in adolescent AOD use and later adult achievement (Howard & Galambos, 2011; Newcomb, 1997). Researchers agree that it is imperative to examine this type of data in order to identify those risk and protective factors that are most influential in the physical, psychological, and social development of adolescents (Berzin, 2010).

Overall, there have been mixed results regarding the influence of certain risk and protective factors on adolescent substance use (Cleveland et al., 2008) and adult outcomes (Berzin, 2010). Researchers have come to inconsistent conclusions regarding how each risk and protective factor affects the other which makes consensus difficult (Berzin, 2010). Generally, researchers agree that risk factors have more of an impact on

the adolescent than those factors which are protective (Hair et al., 2009; Zaff & Michelsen, 2002). Also, having multiple risk factors has been found to be more damaging to both the adolescent and their adult outcomes (Bond et al., 2005; Hutchinson, 2011; Newcomb & Felix-Ortiz, 1992). In regard to race and gender, white males had the most risk with higher rates of alcohol and drug use (Evans-Polce, Vasilenko, & Lanza, 2015; Patrick & O'Malley, 2015), while also having the most protection against negative adult outcomes (Stone et al., 2012; White et al., 2006). Child maltreatment was a risk factor and shown to be a negative influence in all studies cited (Fergusson et al., 2008; Hussey et al., 2006; Molnar et al., 2001). Internalizing and externalizing behaviors were also risk factors and consistently negative (Greenbaum et al., 1991; Schlauch et al., 2013; Veldman et al., 2015). In addition, Religiosity was always a protective, positive factor (Gryczynski & Ward, 2012; Kim-Spoon et al., 2014; Salas-Wright et al., 2012). Family dynamics were found to be very important as both risk (Bremner et al., 2011; Kepper et al., 2014; Marshall, 2014) and protective factors (Marta, 1997; Stronski et al., 2000; Wang et al., 2005). Peer influence proved to be a risk if peers were deviant (Dishion & Owen, 2002; Hicks et al., 2014; Piehler et al., 2012) and protective if peers were proactive (Enoch, 2011; Fergusson et al., 1999). School and community environment was a risk factor if there were crime, safety, and drug influences that affected the adolescent (Abdelrahman et al., 1998; Scheier et al., 1999). These negative effects were magnified if there were other individual risk factors already at play (Cecil et al., 2014; Hicks et al., 2014).

Ultimately, more longitudinal research is needed which follows adolescents through adulthood with the purpose of understanding more about protective factors as

well as risk factors (Berzin, 2010). In order to improve on current public health interventions, more consensus is needed among researchers regarding the most important risk and protective factors related to adolescent AOD use (Cleveland et al., 2008). Finally, understanding the life course and how it's affected from adolescence to adulthood, is imperative to the development of public health interventions that prevent AOD use amongst young people in the United States (Marshall, 2014).

Study Aims & Hypotheses

Study Aim 1

To compare the adult life outcomes (Wave IV) of AOD-using adolescents (Wave I) with the adult life outcomes (Wave IV) of non-AOD-using adolescents (Wave I).

Hypothesis 1a – There is a significant difference between the AOD-using and non-using adolescent groups (Wave I) with regard to primary adult life outcomes (Wave IV) of *educational attainment* and *occupational status*.

Hypothesis 1b – There is a significant difference between the AOD-using and non-using adolescent groups (Wave I) with regard to secondary adult life outcomes (Wave IV) of *household income* and *involvement with the criminal justice system*.

Study Aim 2

To identify risk and protective factors (Wave I) associated with adult *educational attainment* and *occupational status* (Wave IV-primary outcomes) in AOD-using adolescents.

Hypothesis 2a – There is an inverse association between *male gender, child maltreatment, physical fights, feeling depressed, peer AOD use, AODs in the home* (Wave I) and adult *educational attainment* (Wave IV).

Hypothesis 2b - There is a positive association between *non-Latino White race/ethnicity, religiosity, family cohesiveness, school safety, neighborhood safety* (Wave I) and *adult educational attainment* (Wave IV).

Hypothesis 2c – There is an inverse association between *female gender, child maltreatment, physical fights, feeling depressed, peer AOD use, AODs in the home* (Wave I) and *adult occupational status* (Wave IV).

Hypothesis 2d - There is a positive association between *non-Latino White race/ethnicity, religiosity, family cohesiveness, school safety, neighborhood safety* (Wave I) and *adult occupational status* (Wave IV).

Study Aim 3

To identify risk and protective factors (Wave I) associated with *adult household income and involvement with the criminal justice system* (Wave IV-secondary outcomes) in the AOD-using adolescent group.

Hypothesis 3a – There is an inverse association between *female gender, child maltreatment, physical fights, feeling depressed, peer AOD use, AODs in the home* (Wave I) and *adult household income* (Wave IV).

Hypothesis 3b - There is a positive association between *religiosity, family cohesiveness, school safety, neighborhood safety* (Wave I) and *adult household income* (Wave IV).

Hypothesis 3c– There is an inverse association between *female gender, religiosity, family cohesiveness, school safety, neighborhood safety* (Wave I) and *adult involvement with the criminal justice system* (Wave IV).

Hypothesis 3d – There is a positive association between *child maltreatment, physical fights, feeling depressed, peer AOD use, AODs in the home* (Wave I) and *adult involvement with the criminal justice system* (Wave IV).

CHAPTER III
METHODOLOGY
Introduction

The field of public health has recognized the perilous influence of alcohol and other drugs (AODs) on the lives of millions of young people in the United States (Centers for Disease Control and Prevention, 2012; National Center on Addiction and Substance Abuse, 2011). In addition, the World Health Organization has also documented the extreme dangers of alcohol and drug use in children and adolescents around the globe (World Health Organization, 2014). Adolescent AOD use deleteriously affects the physical health of adolescents (Respress et al., 2013) as well as their life choices and future health outcomes (Berzin, 2010; Modecki et al., 2014; Salazar et al., 2004; Schulte et al., 2009). Prevention efforts are key at this time due to the fact that many individuals begin using alcohol and other drugs (AODs) in adolescence (Beyers et al., 2004; Hawkins et al., 1997).

The present study investigated the effects of adolescent AOD use on the adult outcomes of educational achievement, occupational status, household income, and involvement with the criminal justice system. The purpose of the study was to identify risk and protective factors associated with achievement in adult-life for those individuals who used AODs in adolescence. This study was a retrospective examination of nationally-representative longitudinal data on adolescent and adult health (Harris et al., 2009; Kelley & Peterson, 1997; Okunseri, Okunseri, Garcia, Visotcky, & Szabo, 2013). As stated in prior chapters, this study utilized the public-use dataset for the National Longitudinal Study of Adolescent to Adult Health which is cited as Harris & Udry, 1994-

2008, and was downloaded from ICPSR and the Institute for Social Research at the University of Michigan, 1994-2008 [Public Use] (ICPSR 21600).

Data Source

In describing the Add Health study and research design of the Add Health data, the present study draws on information from the study codebooks written by Kelley and Peterson (1997), (B. Pardini, 2011), and information from the Add Health website which is formally cited as Harris et al. (2009) and were referenced throughout. Add Health is a nationally representative longitudinal study which followed a sample of adolescent students in the United States in grades 7-12 during the 1994-1995 school year. The cohort was subsequently tracked through the years and interviewed in their homes at three additional time points. Wave II occurred in 1996, Wave III in 2001-2002, and Wave IV in 2007-2008 when the participants who had all reached adulthood, ranged in age from 24 to 32. With the addition of Wave V, Add Health has now been extended due to expanded funding from the National Institutes of Health (NIH). Data collection will occur in 2016-2018. In addition, the study also recently underwent a formal name change in order to include “to Adult Health” in order to more aptly reflect its past and current adult data collection (Kelley & Peterson, 1997; Harris et al., 2009; UCLA, California Center for Population Research, 2015).

Add Health is a program project directed by researchers at the Carolina Population Center located at the University of North Carolina at Chapel Hill (Kelley & Peterson, 1997). The study was mandated by Congress for the purpose of measuring the effect of social environment on adolescent health issues. Add Health researchers set out

to study adolescents on a national scale and selected a sample that was representative of their extensive effort. A wide-range of health behaviors were examined that directly affects health outcomes related to both the adolescents' present well-being as well as their future health. Researchers also sought to make the dataset accessible to public health, medical, and other professionals, allowing a comprehensive range of professionals to benefit from the findings.

The Add Health study design was developed to measure components of adolescent health and examine influences attributed to their health choices and behaviors (Kelley & Peterson, 1997). Multiple effects were observed in the conceptualization of the study and researchers focused on three sources in which to view differences among adolescents in regard to health. These sources include a focus on the differences in social environment, differences in health-related behaviors, as well as differences related to individual strengths and deficits. Add Health data is unique in that it combines the longitudinal survey data which reports social, economic, psychological and physical well-being with contextual data from the interviews which focuses on the family, neighborhood, community, school, friendships, peer groups, and romantic relationships (Kelley & Peterson, 1997). This combination provides an invaluable opportunity to study how the adolescents' social environment and lifestyle is strongly linked to health and achievement outcomes in young adulthood. In addition to the in-home interviews and survey data, Wave IV also used biological data to better understand the social, behavioral, and biological linkages that exist in health.

Add Health study data is archived with the American Family Data Archive (AFDA) (Harris et al., 2009) and there are several public-use databases associated with

this project. As stated previously, the present study utilized the public-use dataset downloaded from ICPSR, which is part of the Institute for Social Research at the University of Michigan (Harris & Udry, 1994-2008). The public-use dataset was created by extracting a random sample of 6,504 adolescents taken from the larger core study sample (Broman et al., 2006). In addition, the public-use dataset includes all of the data from each wave of in-home interviews, but without identifiers in order to protect the identities of participants. This study uses respondent data solely from Waves I (1994-1995) and IV (2007-2008) of the dataset.

Add Health Research Design & Approach

The research design for Add Health focused on three areas of differences in adolescent health and their effects (Kelley & Peterson, 1997). These areas of interest included the examination of different social environments, different behaviors as they related to the health of the adolescent, and those strengths and susceptibilities encompassed by the adolescent. The study was designed to be longitudinal to allow for the examination of health changes over time which is imperative in observing the influence of environment and other influences on the health of adolescents. Add Health was also designed as a clustered school-based study in order to effectively vet the population of interest and also access the adolescent's peer network which researchers hypothesized would be greatly influential in the participant's own health behaviors.

The primary Add Health sampling frame was derived from a database collected by Quality Education Data, Inc. (Kelley & Peterson, 1997). From this sampling frame of 26,666 high schools located in each of the 50 states and the District of Columbia, a

sample of 80 high schools was selected. High schools were defined as having an 11th grade and more than 30 students enrolled. Schools were stratified by size, school type, census region, level of urbanization, and their percentage of white students. Schools were also carefully chosen with odds comparative to size. These systematic sampling and stratification methods were used to ensure that schools were representative in respect to U.S. region, urbanicity, size, type, and ethnicity.

After the sampling process was complete, each school was approached to participate in the Add Health study (Kelley & Peterson, 1997). Those schools that did not want to participate were replaced with schools within the stratum. Schools that agreed to participate provided a complete list of students and also made arrangements to administer the in-school questionnaire during a selected class period. Each high school was then paired with its feeder middle or junior high school with the assistance of the high school. The end result of the recruitment process was a high school and a feeder school in each of the 80 communities originally represented in the sampling frame. Final number of schools that participated in the core study was 132 since some schools encompassed 7th grade to 12th grade and therefore served as their own feeder school (Harris et al., 2009). Final core sample was 90,118 for the in-school interview and 20,745 for the in-home interview. The public-use dataset sample (n= 6,504) was drawn from two independent samples which included a nationally-representative core sample of adolescent students (n=5,984) and an over-sample of high-education African-American students living with at least one parent/parent-figure with a college degree (n=432). Some students were members in each group (n= 88).

The present study approached the Add Health dataset with the intent of addressing the lack of longitudinal studies that explored risk factors and adult outcomes for vulnerable adolescents (Berzin, 2010). Because there are not a lot of findings that show the adult outcomes of adolescent substance use (Fergusson et al., 2008; Newcomb, 1997; Newcomb & Bentler, 1988), more longitudinal studies are needed to follow adolescents to adulthood in order to advance the knowledge of risk and protective factors. There also have not been many studies that examined longitudinal data to view adult educational attainment and career success throughout the life course beginning in adolescence (Howard & Galambos, 2011). From this point of reference, it was determined that a retrospective research design was the most appropriate study design to undertake in examining the longitudinal data. Data from the Add Health study was selected and analyzed due to the fact that the study is the most thorough, widespread, and inclusive longitudinal study of adolescents ever conducted (Harris et al., 2009).

Add Health Data Collection

The present study draws on information from the study codebooks written by Kelley and Peterson (1997), (B. Pardini, 2011), and information from the Add Health website which is formally cited as Harris et al. (2009) in describing the Add Health study and research design.

Wave I - In-School Questionnaire & In-Home Interview

Data collection for Add Health began in the United States during the 1994-1995 school year. Parental consent was obtained prior to completion of the self-reported questionnaire (Kelley & Peterson, 1997). Approximately 90,118 students in grades 7

through 12 were administered the in-school questionnaire which took 45 to 60 minutes and was conducted with paper & pencil. In addition, students were given school rosters to use while identifying friends on the questionnaire. These rosters were collected and destroyed after the survey was completed. The questionnaire was administered in class between September 1994 and April 1995.

Of the 90,118 students that completed the in-school questionnaire, approximately 12,105 students were interviewed in their homes between April and December 1995 (Kelley & Peterson, 1997). Students were stratified by gender and grade level and approximately 17 adolescents were randomly selected from each stratum. In addition, specific ethnic groups were over-sampled including those Black adolescents that were from well-educated families where at least one parent had obtained a college degree, Chinese adolescents, Cuban adolescents, and Puerto Rican adolescents. The final sample consisted of about 200 students from each of the 80 high school and feeder middle school pairs.

The in-home interviews were conducted between April and December 1995 by interviewers who read general questions to students out loud while data was entered into a computer (Harris et al., 2009; Kelley & Peterson, 1997). Data surrounding sensitive topics were collected using earphones and students entered their own answers into laptop computers with the Computer-Assisted Self-Interview (audio-CASI) program. All students were given the same interview. Interviews began with the Add Health Picture Vocabulary Test (AHPVT). This test was a condensed and computerized version of the Peabody Picture Vocabulary Test-Revised. The present study utilizes the public-use

dataset which includes 5,800 variables and 6,504 cases. Of these cases, 4,769 respondents (73%) have all three types of Wave I data (in-home, in-school and parent). This cohort of 12,105 adolescent boys and girls in the core study sample were then followed into young adulthood and interviewed at three additional time points (Kelley & Peterson, 1997).

Additional parts of the Add Health study included questionnaires completed by administrators at each participating school, questionnaires completed by the adolescents who completed the in-home interview, and context information on the participants' neighborhoods and communities gathered from government sources and published databases (Kelley & Peterson, 1997). These sections were designed to give a more complete look at the adolescent participants and view their environments from a different perspective.

Wave II - In-Home Interview

Wave II in-home interviews were conducted between April through August of 1996 and 4,834 of the 6,504 Wave I participants were interviewed (Kelley & Peterson, 1997). Questions were similar to the Wave I questionnaire. The present study does not utilize data collected from this wave in the analysis.

Wave III - In-Home Interview

Wave III in-home interviews were conducted between August 2001 through April 2002 and 4,882 of the 6,504 Wave I participants were interviewed (Kelley & Peterson, 1997; B. Pardini, 2011). All participants had reached adulthood and were between 18 and 26 years old. Select biomarkers were added to the file. The present study does not utilize data collected from this wave in the analysis.

Wave IV - In-Home Interview

Wave IV in-home interviews were conducted between 2007 and 2008 with the cohort ranging in age from 24 to 32 years old (Kelley & Peterson, 1997). Of the original 6,504 Wave I participants; 5,114 were interviewed. Select biomarkers were added to the file. The present study utilizes this data in its analysis.

Reliability of Measures

Items in the Add Health measures are not directly connected to questions from other studies (Kelley & Peterson, 1997). There were no complete scales that were used from the literature; however, there were studies which acted as a guide in developing the questions on the survey. Certain items were supplied by other agencies with similar goals and were revised by Add Health researchers. All items used in the survey were pilot tested and re-written according to feedback. When determining the reliability of the Add Health instrument, it is recommended that researchers calculate the alpha reliability of summed scales, use confirmatory or exploratory factor analysis, try testing different measurement assumptions using structural equation models, or utilize a split-sample design technique.

Reliability of self-reported data was also increased during the study by the use of earphones and “audio-CASI”, Computer-Assisted Self-Interviewing, which allowed respondents privacy in answering questions surrounding sensitive topics and behaviors (B. Pardini, 2011).

Construction of Study Panel

The present study extracted a smaller panel from the Add Health public-use dataset (Harris & Udry, 1994-2008) for the purpose of secondary analysis. Respondent data from Wave I (1994-1995) and Wave IV (2007-2008) were utilized. The responses of 4,351 adolescent boys and girls were examined in Wave I and 3,368 of the same respondents as men and women in Wave IV, with 22.6%, n=983 lost to follow-up.

For purposes of the dissertation study and its analysis, the following inclusion and exclusion criteria were utilized in selecting the panel. Inclusion Criteria for the study sample included adolescent boys and girls attending high school (grades 9-12), adolescents of all races and ethnicities, and adolescents between the ages of 13 and 19. Exclusion Criteria included adolescent boys and girls not attending high school and adolescents younger than 13 or older than 19 years. The sample used for the present study did not include those participants that were not in school or were in middle school at the time of Wave I. Only high school students were included. Rational is based on the fact that middle school students and high school students are vastly different with regard to their development and the different challenges they face (Deschenes, Little, Grossman, & Arbreton, 2010).

The Wave I sample was then divided into two groups which consisted of AOD-using adolescents and non-AOD using adolescents. Formation of the AOD-using and non-AOD-using groups was completed by using each respondent's self-reported responses to questions surrounding drug and alcohol use from the Wave I in-home questionnaire. Students were asked about their alcohol, marijuana, cocaine, inhalant, other illegal drug, and injectable drug usage as well as when they initiated their AOD use

(i.e. Have you had a drink of beer, wine, or liquor—not just a sip or a taste of someone else’s drink—more than 2 or 3 times in your life? How old were you when you tried any kind of cocaine— including powder, freebase, or crack cocaine—for the first time?)

Those students that had never used any alcohol or other drugs were placed into the non-AOD-using group while students that reported any use of alcohol or drugs were placed into the AOD-using group. All questions from the study can be viewed in the Appendix.

Of the total number of students in high school (n=4,351), there were 85 students that had missing data regarding their alcohol and other drug (AOD) use. The total number of high school students with data reflecting AOD use was 4,266. The AOD-Using group had 2,833 (66.4%) adolescent respondents and the Non-AOD-Using Group had 1,433 (33.6%). Nationally representative data was weighted to account for stratification, clustering, and over-sampling of specific groups (Ford et al., 2005; Khan, Berger, Wells, & Cleland, 2012).

Subpopulation analysis was then performed. All adolescent boys and girls not in high school, as well as those that were younger than 13, and older than 19, were not included in the analyses. Out of the total sample of 4,351 adolescents, there were 4,266 students which made up the study sample. There were 2,833 students in the AOD-Using group and 1,433 students in the non-AOD-using group. Missing values included 85 students for which there was no data on substance use.

Outcome Variables – Wave IV

All outcome variables and values are listed in their entirety in the Appendix.

Educational Attainment was measured by the adult’s self-reported response to one

question in Wave IV. “What is the highest level of education that you have achieved to date?” Values were collapsed and a new indicator variable was created which ranked each education level. Values ranged from 1= “no high school diploma” to 5= “completed post baccalaureate professional education (master's, doctoral, law, medical degrees)”. *Occupational Status* was measured by the adult’s self-reported response to one question in Wave IV. “Which one of the following categories best describes what you're doing now? Respondents then chose their current occupation which was assigned a 6-digit 2010 Standard Occupational Classification (SOC) System code based on a hierarchical system developed by the Bureau of Labor Statistics with 461 broad occupations, 97 minor groups, and 23 major groups (Bureau of Labor Statistics, 2010). In a variation on the methods used by Kirchoff et al. (2011) as well as Queiros, Wehby, & Halpern (2015), SOC codes were then entered into the SOC Crosswalk created by the Occupational Information Network (O*NET) classification and database version 20.3 (National Center for O*NET Development, 2016) which assigned each occupation to one of 5 Zones. Zone 1= occupations that didn’t require a high school diploma to Zone 5= occupations which required post baccalaureate professional education (master's, doctoral, law, medical degrees etc. etc.) Once assignment was completed, an indicator variable was created which ranked occupations by zone. *Household Income* was measured by the adult’s self-reported response to one question in Wave IV. “Thinking about your income and the income of everyone who lives in your household and contributes to the household budget, what was the total household income before taxes and deductions in {2006/2007/2008}?” Values were collapsed and a new indicator variable was created which ranked each income level. Values ranged from 1= “less than \$5,000 -\$29,999” to

5= "\$100,000 or more". *Involvement with the Criminal Justice System* was measured by the adult's self-reported response to one question in Wave IV. "Have you ever been arrested?" Values were 0= no and 1= yes.

Predictor Variables – Wave I

All predictor variables and values are listed in their entirety in the Appendix. *Gender* was measured by the adolescent's self-reported response to one question in Wave I. "What sex are you?" Values were 1=Male and 2=Female. *Age* was measured by the adolescent's self-reported response to two questions in Wave I. "What is your birth month?" and "What is your birth year?" *Age* was then calculated using a formula devised by statisticians at Add Health (Harris et al., 2009) which utilized respondents' birth month, the 15th day of the month for all respondents due to missing data for actual birthdate, birth year, and the year the Wave I interview was conducted (1994 or 1995). The variable was then coded by Add Health statisticians with descending values which ranged from 19 to 13 years for the present study. *Grade* was measured by the adolescent's self-reported response to one question in Wave I. "What grade are you in?" Values ranged from 9th to 10th grades.

The present study combined the two variables of *Race* and *Ethnicity* into one which is referred to as, Race/Ethnicity as other researchers have done when analyzing Add Health data (Allen, McNeely, & Orme, 2016). Respondents were asked, "Are you of Hispanic or Spanish origin?" Values included 0=No and 1=Yes, as well as, "What is your race?" Values were 1=White, 2=Black or African-American, 3=Native American or American Indian, 4=Asian or Pacific Islander, and 5=Other (Multiracial-for respondents

who chose more than one racial category). *Race/Ethnicity* categories include, non-Latino White; non-Latino Black or African-American; non-Latino Native-American or American Indian; non-Latino Asian; non-Latino Multi-Racial or “Other”; and Latino.

Questions related to child maltreatment were asked retrospectively once adolescents were adults in Wave IV. *Physical Abuse* was measured with one question that asked, “Before your 18th birthday, how often did a parent or adult caregiver hit you with a fist, kick you, or throw you down on the floor, into a wall, or down stairs?”. Values ranged from 0= this has never happened, to 5= more than ten times. *Sexual Abuse* was measured with one question in Wave IV which asked, “How often did a parent or other adult caregiver touch you in a sexual way, force you to touch him or her in a sexual way, or force you to have sexual relations?”. Values ranged from 0= this has never happened, to 5= more than ten times.

All questions pertaining to religiosity were asked in Wave I. *Religious Service Attendance* was measured with one question that asked, “In the past 12 months, how often did you attend religious services?” Values included 1= once a week or more to 4= never. *Importance of Religion* was measured with one question that asked, “How important is religion to you?” Values included 1= very important to 4= not important at all. *Frequency of Prayer* was measured with one question that asked, “How often do you pray?” Values included 1= at least once a day to 5= never.

Questions related to externalizing and internalizing behaviors were asked in Wave I. *Physical Fights* was measured by the adolescent’s self-reported response to one question in Wave I which asked, “During the past 12 months, how often did each of the following things happen? You got into a physical fight?” Values ranged from 0 = never

to 2 = more than once. *Suspension from School* was measured by the question, “Have you ever received an out-of-school suspension from school?” Values were 0 = no and 1 = yes. *Expelled from School* was measured by the question, “Have you ever been expelled from school?” Values were 0 = no and 1 = yes. *Getting Along with Your Teachers* was measured by the question, “Since school started this year, how often have you had trouble getting along with your teachers?” Values ranged from 0 = never to 4=every day. *Feeling Depressed* was measured by the question, “How often was each of the following things true during the past week? You felt depressed?” Values were 0 = never or rarely to 3 = most of the time or all of the time. *Feeling Blue* was measured by the question, “You felt that you could not shake off the blues, even with help from your family and your friends.” Values ranged from 0 = never or rarely to 3 = most of the time or all of the time.

All questions related to interpersonal relationships were asked in Wave I. *Family Cohesiveness* was measured by the adolescent’s self-reported responses to one question, “How much do you feel that you and your family have fun together?” Values ranged from 1=not at all to 5=very much. *Family & Parenting 1* was measured by the question, “Do your parents let you make your own decisions about the time you must be home on weekend nights?” Values were 0 = no and 1 = yes. *Family & Parenting 2* was measured by the question, “Do your parents let you make your own decisions about the people you hang around with?” Values were 0 = no and 1 = yes. *AOD Use in the Home* was measured by the adolescent’s self-reported responses to two questions in Wave I. “Is alcohol easily available to you in your home?” and “Are illegal drugs easily available to you in your home?” Values were 0 = No and 1 = Yes. *Peer Influence* was measured by

the adolescent's self-reported responses to two questions in Wave I, "Of your 3 best friends, how many drink alcohol at least once a month?" and "Of your 3 best friends, how many use marijuana at least once a month?" Values ranged from 0=no friends to 3=three friends.

Questions related to school and community environment were asked in Wave I. *School Satisfaction* was measured by the question, "How much do you agree or disagree with the following: If SCHOOL YEAR: You are happy to be at your school." Values ranged from 1=strongly agree to 5=strongly disagree. *School Safety* is measured by adolescent's self-reported response to one question, "How much do you agree or disagree with the following statements: I feel safe in my school." Values range from 1=strongly agree to 5=strongly disagree. *Neighborhood Satisfaction* is measured by adolescent's self-reported response to one question, "On the whole, how happy are you with living in your neighborhood?" Values range from 1=not at all to 5=very much. *Neighborhood Safety* is measured by adolescent's self-reported response to one question, "How much do you agree or disagree with the following statements: I feel safe in my neighborhood." Values ranged from 1=strongly agree to 5=strongly disagree.

Data Analysis

All analyses were conducted in Stata, version 14.1, statistical software (StataCorp, 2015) using Stata command syntax. In order to avoid obtaining biased estimates, nationally representative data was weighted to account for stratification, clustering, and over-sampling of specific groups (Chen & Chantala, 2014; Ford et al., 2005; Khan et al., 2012). Stata survey software allowed for design-based analysis which adjusted estimates

for clustering and unequal probabilities of selection (Chen & Chantala, 2014). Indicator variables were created to generate subpopulation of interest. Subpopulation analysis was then utilized to generate unbiased results as recommended by Add Health researchers and statisticians at the Carolina Population Center (A. Sorgi, personal communication, May 25, 2016). Confounding variables were controlled for in regression models including maternal education, paternal education, (Khan et al., 2012) childhood household income, mother's occupation, father's occupation, mother's imprisonment, and father's imprisonment.

Descriptive Statistics

Descriptive statistics were calculated and compared for both the AOD-using group, and the non-AOD using group of adolescents. Wave I demographic characteristics include race/ethnicity, gender, grade level, and age. Missing values were also calculated and reported for both groups of adolescents. Listwise deletion was used in Stata, version 14.1, statistical software (StataCorp, 2015) which removed cases without complete data when performing all analyses (Mitchell, 2010).

Study Aim 1

Comparing Differences Between Groups

Educational Achievement

Ho: The AOD-using group and the non-AOD-using group are identically distributed in regard to their level of educational achievement.

Ha: The AOD-using group and the non-AOD-using group are not identically distributed in regard to their level of educational achievement.

The Mann-Whitney U-Test was used to test the difference between these two independent groups. $\alpha = 0.05$

Occupational Status

Ho: The AOD-using group and the non-AOD-using group are identically distributed in regard to their occupational status.

Ha: The AOD-using group and the non-AOD-using group are not identically distributed in regard to their occupational status.

The Mann-Whitney U-Test was used to test the difference between these two independent groups. $\alpha = 0.05$

Household Income

Ho: The AOD-using group and the non-AOD-using group are identically distributed in regard to their household income.

Ha: The AOD-using group and the non-AOD-using group are not identically distributed in regard to their household income.

The Mann-Whitney U-Test was used to test the difference between these two independent groups. $\alpha = 0.05$

Criminal Justice System

Ho: There is no relationship between AOD usage as an adolescent and involvement with the criminal justice system.

Ha: There is a relationship between AOD usage as an adolescent and involvement with the criminal justice system.

A chi-square test was used to test whether AOD usage as an adolescent is associated with involvement with the criminal justice system. $\alpha = 0.05$

Study Aim 2 & Study Aim 3

Logistic Regression

Binomial Logistic Regression and Ordinal Logistic Regression were conducted to test the effect ($\alpha = 0.05$) of each Wave I independent variable adjusted for other independent variables predicting Wave IV outcome variables.

Binomial Logistic Regression Model: Predicting Involvement with the Criminal Justice System

$$\begin{aligned} \text{Log} (\text{Pr}(Y_4=1)/\text{Pr}(Y_4=0)) = & \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3+ \beta_4X_4+ \beta_5X_5+ \beta_6X_6+ \beta_7X_7+ \\ & \beta_8X_8+ \beta_9X_9 + \beta_{10}X_{10} + \beta_{11}X_{11} + \beta_{12}X_{12} + \beta_{13}X_{13} + \beta_{14}X_{14} + \beta_{15}X_{15} + \beta_{16}X_{16} \\ & + \beta_{17}X_{17} + \beta_{18}X_{18} + \beta_{19}X_{19} + \beta_{20}X_{20} + \beta_{21}X_{21} + \beta_{22}X_{22} + \beta_{23}X_{23} + \beta_{24}X_{24} + \\ & \beta_{25}X_{25} + \beta_{26}X_{26} \end{aligned}$$

Predicting Involvement with the Criminal Justice System

Ho: No independent variables in the model are useful in explaining the variability in Y, or predicting Y.

β_1 or β_2 or β_3 or β_4 or β_5 or β_6 or β_7 or β_8 or β_9 or β_{10} or β_{11} or β_{12} or β_{13} or β_{14} or β_{15} or β_{16} or β_{17} or β_{18} or β_{19} or β_{20} or β_{21} or β_{22} or β_{23} or β_{24} or β_{25} or $\beta_{26}=0$

Ha: One or more independent variables in the model are useful in explaining the variability in Y or also predicting Y.

β_1 or $-\beta_2$ or β_3 or β_4 or $+\beta_5$ or $+\beta_6$ or $-\beta_7$ or $-\beta_8$ or $-\beta_9$ or $+\beta_{10}$ or β_{11} or β_{12} or β_{13} or $+\beta_{14}$ or β_{15} or $-\beta_{16}$ or β_{17} or β_{18} or $+\beta_{19}$ or $+\beta_{20}$ or $+\beta_{21}$ or $+\beta_{22}$ or β_{23} or $-\beta_{24}$ or β_{25} or $-\beta_{26} \neq 0$

Ordinal Logistic Regression Models: *Predicting Educational Attainment, Occupational Status, & Household Income*

$\log(\theta_j = \Pr(Y < j) / \Pr(Y > j)) = \alpha_j - (\beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{16} + \beta_{17} X_{17} + \beta_{18} X_{18} + \beta_{19} X_{19} + \beta_{20} X_{20} + \beta_{21} X_{21} + \beta_{22} X_{22} + \beta_{23} X_{23} + \beta_{24} X_{24} + \beta_{25} X_{25} + \beta_{26} X_{26})$

Example using one of the 26 predictor variables:

Ho: β_1 is not useful in the model in explaining the variability in Y, or predicting Y.

$\beta_1 = 0$

Ha: β_1 is not useful in the model in explaining the variability in Y, or predicting Y.

$\beta_1 \neq 0$

Predicting Educational Attainment

Ho: No independent variables in the model are useful in explaining the variability in Y, or predicting Y.

β_1 or β_2 or β_3 or β_4 or β_5 or β_6 or β_7 or β_8 or β_9 or β_{10} or β_{11} or β_{12} or β_{13} or β_{14} or β_{15} or β_{16} or β_{17} or β_{18} or $-\beta_{19}$ or $-\beta_{20}$ or $-\beta_{21}$ or $-\beta_{22}$ or β_{23} or β_{24} or β_{25} or $\beta_{26} = 0$

Ha: One or more independent variables in the model are useful in explaining the variability in Y or also predicting Y.

β_1 or $-\beta_2$ or β_3 or β_4 or $-\beta_5$ or $-\beta_6$ or $+\beta_7$ or $+\beta_8$ or $+\beta_9$ or $-\beta_{10}$ or β_{11} or β_{12} or β_{13} or $-\beta_{14}$ or β_{15} or $+\beta_{16}$ or β_{17} or β_{18} or $-\beta_{19}$ or $-\beta_{20}$ or $-\beta_{21}$ or $-\beta_{22}$ or β_{23} or $+\beta_{24}$ or β_{25} or $+\beta_{26} \neq 0$

Predicting Occupational Status

Ho: No independent variables in the model are useful in explaining the variability in Y, or predicting Y.

β_1 or β_2 or β_3 or β_4 or β_5 or β_6 or β_7 or β_8 or β_9 or β_{10} or β_{11} or β_{12} or β_{13} or β_{14} or β_{15} or

β_{16} or β_{17} or β_{18} or β_{19} or β_{20} or β_{21} or β_{22} or β_{23} or β_{24} or β_{25} or $\beta_{26} = 0$

Ha: One or more independent variables in the model are useful in explaining the variability in Y or also predicting Y.

β_1 or $-\beta_2$ or β_3 or β_4 or $-\beta_5$ or $-\beta_6$ or $+\beta_7$ or $+\beta_8$ or $+\beta_9$ or $-\beta_{10}$ or β_{11} or β_{12} or β_{13} or $-\beta_{14}$ or β_{15} or $+\beta_{16}$ or β_{17} or β_{18} or $-\beta_{19}$ or $-\beta_{20}$ or $-\beta_{21}$ or $-\beta_{22}$ or β_{23} or $+\beta_{24}$ or β_{25} or $+\beta_{26} \neq 0$

Predicting Household Income

Ho: No independent variables in the model are useful in explaining the variability in Y, or predicting Y.

β_1 or β_2 or β_3 or β_4 or β_5 or β_6 or β_7 or β_8 or β_9 or β_{10} or β_{11} or β_{12} or β_{13} or β_{14} or β_{15} or β_{16} or β_{17} or β_{18} or β_{19} or β_{20} or β_{21} or β_{22} or β_{23} or β_{24} or β_{25} or $\beta_{26}=0$

Ha: One or more independent variables in the model are useful in explaining the variability in Y or also predicting Y.

β_1 or $-\beta_2$ or β_3 or β_4 or $-\beta_5$ or $-\beta_6$ or $+\beta_7$ or $+\beta_8$ or $+\beta_9$ or $-\beta_{10}$ or β_{11} or β_{12} or β_{13} or $-\beta_{14}$ or β_{15} or $+\beta_{16}$ or β_{17} or β_{18} or $-\beta_{19}$ or $-\beta_{20}$ or $-\beta_{21}$ or $-\beta_{22}$ or β_{23} or $+\beta_{24}$ or β_{25} or $+\beta_{26}\neq 0$

Ethical Considerations

The present study utilized a public-use dataset for secondary analysis. There were no interactions with human participants and the dataset did not include identifiers which would have compromised confidentiality. Despite this fact, data was handled with care and usage guidelines set by the Carolina Population Center were followed. Clearance for this study was secured from the Florida International University Institutional Review Board (IRB) before the research study began. Researchers for the Add Health study obtained parental consent for all of the minor participants in the study (Kelley & Peterson, 1997) and written informed consent was obtained from all participants as adults (Harris et al., 2009). Clearance for the study was obtained from the University of North Carolina School of Public Health Institutional Review Board (IRB). In addition, all protocols were followed to maintain the confidentiality of the data and the participants' private information. Restricted use datasets are strictly controlled and only distributed to those researchers that will maintain the security of the data to the utmost degree.

CHAPTER IV

RESULTS

In the secondary analysis of data from the National Longitudinal Study of Adolescent to Adult Health, demographic statistics are first described for the AOD-using high school students and their non-AOD-using counterparts in Wave I. Next, Wave IV adult outcomes are presented and compared for the cohort. Finally, findings regarding risk and protective factors for both the AOD-using and non-AOD-using student groups are presented and organized on the Individual, Interpersonal, and Environmental levels.

Wave I Descriptive Statistics

The Wave I public-use dataset sample consisted of 6,504 adolescent students in grades 7-12 who took the Wave I In-home questionnaire between 1994-1995. The study sample included only those students who were in high school (grades 9-12) and between the ages of 13-19 years. The total number of students in the study sample totaled 4,351. There were 2,118 (48.7 %) males and 2,233 (51.3 %) females. Of the total number of students in high school (n=4,351), 85 students had missing data regarding their alcohol and other drug (AOD) use. The total number of high school students with data reflecting AOD use was 4,266. The majority of high school students in the sample self-reported the use of some type of AODs in their lifetime (n=2,833, 66.4%) compared to those students who self-reported no AOD use (n=1,433, 33.6%).

The Wave I statistical characteristics of the AOD-using and non-AOD-using groups. As seen in Table 1, proportions reported are based on the entire sample of high school students and are totaled by column. With regard to gender, there were 1,427,

females (50.4%) in the AOD-using group, while there were 1,406, males (49.6%). By contrast, there were 775 females (54.1%) in the non-AOD-using group compared to 658 males (45.9%). The mean age for the AOD-using group was 16.45 years (ranging from 13 to 19, SD=1.22 years) while the mean age for the non-AOD-using adolescents was 16.18 years (ranging from 13 to 19, SD=1.26).

Shown in Table 1, the majority of the sample was made up of non-Latino White students with 1,739 (61.5%) in the AOD-using group and 729 (51.1%) in the non-AOD-using non-Latino White students in the sample. The next largest racial/ethnic group were non-Latino Black or African-American students with 516 (18.3%) AOD-using and 412 (28.9%) non-AOD-using students respectively. The remaining students in both sample groups were comprised of Latino, non-Latino Multi-Racial, non-Latino Asian, and non-Latino Native-American or American Indian students; 13 cases were missing from the race/ethnicity data.

Table 1. Wave I Total Sample Demographic Characteristics for AOD-Using & Non-AOD-Using Adolescents

Predictor Variables	AOD-Using Frequency (n)	AOD-Using Percentage (%)	Non-AOD Using Frequency (n)	Non-AOD Using Percentage (%)	Test Statistic	p
Gender (n=4,266) *					Chi-Square $\chi^2= 5.25$.022
Male	1,406	49.6	658	45.9		
Female	1,427	50.4	775	54.1		
Age (years) (n=4,266) *	2,833	99.9	1,433	99.9	t-test t = -6.69	<.001
13	5	.18	5	.35		
14	136	4.8	111	7.7		
15	551	19.4	350	24.4		

16	726	25.6	394	27.5		
17	771	27.2	322	22.5		
18	585	20.6	223	15.6		
19	59	2.1	28	1.9		
	Mean 16.45	SD ±1.22	Mean 16.18	SD ±1.26		
Grade (n=4,266) *	2,833	100.0	1,433	100.0	Mann-Whitney z = -7.14	<.001
9 th	640	22.6	443	30.9		
10 th	718	25.3	400	27.9		
11 th	777	27.4	325	22.7		
12 th	698	24.7	265	18.5		
	Mean 10.54	SD ±1.09	Mean 10.29	SD ±1.09		
Race/ Ethnicity (n=4,253) *	2,826	100.0	1,427	100.0	Chi-Square χ ² = 71.06	<.001
Non-Latino White	1,739	61.5	729	51.1		
Non-Latino Black	516	18.3	412	28.9		
Non-Latino Native	17	.6	5	.3		
Non-Latino Asian	86	3.0	57	4.0		
Non-Latino Multi- Racial	140	5.0	64	4.5		
Latino	328	11.6	160	11.2		

*Denotes totals for both AOD-using and non-AOD-using sample groups.

AOD use within gender group is described in Table 2, which shows 1,427 (64.8%) of female students used AODs in Wave I, while 775 (35.2%) abstained. For males, 1,406 (68.1%) of the group used AODs in Wave I, while 658 (31.9%) abstained. The highest AOD usage was shown in 18-year olds with 585 students in the sample (72.4%), while the lowest use was seen in 13-year olds with 5 students in the sample (50.0%). Non-Latino Native-American or American Indian students had the highest

AOD-usage with 17 (77.3%), while lowest AOD-use was observed in the non-Latino Black or African-American students with 516 (55.6%).

Table 2. Wave I Specific Group Demographic Characteristics for AOD-Using & Non-AOD-Using Adolescents

Predictor Variables	AOD-Using Frequency (n)	AOD-Using Percentage (%)	Non-AOD Using Frequency (n)	Non-AOD Using Percentage (%)
<i>Gender (n=4,266) *</i>				
Male (n=2,064)	1,406	68.1	658	31.9
Female (n=2,202)	1,427	64.8	775	35.2
<i>Age (years) (n=4,266) *</i>				
13 (n= 10)	5	50.0	5	50.0
14 (n= 247)	136	55.1	111	44.9
15 (n= 901)	551	61.2	350	38.8
16 (n= 1,120)	726	64.8	394	35.2
17 (n= 1,093)	771	70.5	322	29.5
18 (n= 808)	585	72.4	223	27.6
19 (n= 87)	59	67.8	28	32.2
<i>Grade (n=4,266) *</i>				
9 th (n= 1,083)	640	59.1	443	40.9
10 th (n= 1,118)	718	64.2	400	35.8
11 th (n= 1,102)	777	70.5	325	29.5
12 th (n=963)	698	72.5	265	27.5
<i>Race/ Ethnicity (n=4,253) *</i>				
Non-Latino White (n=2,468)	1,739	70.5	729	29.5
Non-Latino Black (n=928)	516	55.6	412	44.4
Non-Latino Native (n=22)	17	77.3	5	22.7
Non-Latino				

Asian (n=143)	86	60.1	57	39.9
Non-Latino Multi-Racial (n=204)	140	68.6	64	31.4
Latino (n=488)	328	67.2	160	32.8

*Denotes totals for both AOD-using and non-AOD-using sample groups.

As seen in Table 3, the highest percentage of AOD-using males was among the non-Latino Native or American Indian students with 10 (90.9%), while the highest female AOD use was seen in non-Latino White students with 884 (70.0%). By contrast, the lowest AOD-use was observed in both non-Latino Black or African American males with 257 (57.9%) students and females with 259 (53.5%) students.

Table 3. Wave I Race/Ethnicity and Gender Characteristics for AOD-Using & Non-AOD-Using Adolescents

	AOD-Using Frequency (n)		AOD-Using Percentage (%)		Non-AOD Using Frequency (n)		Non-AOD Using Percentage (%)	
	M	F	M	F	M	F	M	F
Gender Male (M) Female (F)								
Non-Latino White (n=1,204) * (n=1,264) **	855	884	71.0	70.0	349	380	29.0	33.0
Non-Latino Black (n=444) * (n=484) **	257	259	57.9	53.5	187	225	42.1	46.5
Non-Latino Native (n=11) * (n=11) **	10	7	90.9	63.6	1	4	9.1	36.4
Non-Latino Asian	44	42	61.1	59.2	28	29	38.9	40.8

(n=72) * (n=71) **								
Non-Latino Multi-Racial (n=87) * (n=117) **	59	81	67.8	69.2	28	36	32.2	30.8
Latino (n=241) * (n=247) **	178	150	73.9	60.7	63	97	26.1	39.3

*Denotes total for male sample group.

**Denotes total for female sample group.

As described in Table 4, the majority of students within the Pan-Ethnic Latino racial/ethnic group self-identified as Multi-Racial or White (n=217, 44.5% and n=199, 40.7% respectively). The highest percentage of AOD usage within each group was by Black or African-American Latinos with 10 (76.9%) students, while the lowest percentage of use was by Native American or American Indian Latinos with 9 (50%) students.

Table 4. Wave I Pan-Ethnic Latino Percentages for AOD-Using & Non-AOD-Using Adolescents

Racial Group	AOD-Using Frequency (n)	AOD-Using Percentage (%)	Non-AOD Using Frequency (n)	Non-AOD Using Percentage (%)
<i>Latino Ethnicity (n=488) *</i>	328	67.2	160	32.8
Latino-White (n=199) * 40.7% **	131	65.8	68	34.2
Latino-Black (n=13) * 2.7% **	10	76.9	3	23.1
Latino-Native (n=18) * 3.7% **	9	50.0	9	50.0
Latino-Asian (n=3) * 0.6% **	2	66.7	1	33.3
Latino Multi-Racial (n=217) * 44.5%	148	68.2	69	31.8

**				
Latino- Unspecified (n=38) * 7.8% **	28	73.7	10	26.3

*Denotes totals for both AOD-using and Non-AOD-using sample groups.

**Denotes percentage for specific racial group within total AOD-using and Non-AOD-using sample group.

Wave I alcohol and other drug use is described within the sample of AOD-using adolescents. As seen in Table 5, the majority of each subgroup reported initiation to alcohol or drugs between the ages of fourteen and sixteen. Age at initiation variables are used for descriptive purposes only within this study. Due to the high numbers of students with missing data for other predictor variables included in the study, they were not able to be included in the regressions detailed later in the chapter. To compensate for this omission, student's age and grade level data provided at Wave I offered insight into their current developmental stage at time of AOD use.

Table 5. Wave I AOD Age of Initiation by Drug Type for AOD-Using Adolescents

Age of Initiation Variables	AOD-Using Frequency (n)	AOD-Using Percentage (%)
<i>Age of Initiation Alcohol (n=2,041)</i>	2,041	100.0
1 Less than 12 years	264	12.9
2 12-13 years	548	26.8
3 14-16 years	1,093	53.6
4 17 years	110	5.4
5 18-19 years	26	1.3
<i>Age of Initiation Marijuana (n=1,350)</i>	1,350	100.0
1 Less than 12 years	89	6.6
2 12-13 years	249	18.4
3 14-16 years	858	63.6
4 17 years	116	8.6

5 18-19 years	38	2.8
<i>Age of Initiation Cocaine (n=156)</i>	156	100.0
1 Less than 12 years	13	8.3
2 12-13 years	16	10.3
3 14-16 years	92	59.0
4 17 years	25	16.0
5 18-19 years	10	6.4
<i>Age of Initiation Inhalants (n=235)</i>	235	100.0
1 Less than 12 years	50	21.3
2 12-13 years	75	31.9
3 14-16 years	97	41.3
4 17 years	11	4.7
5 18-19 years	2	.8
<i>Age of Initiation Other Illegal Drugs (n=403)</i>	403	100.0
1 Less than 12 years	22	5.5
2 12-13 years	54	13.4
3 14-16 years	258	64.0
4 17 years	57	14.1
5 18-19 years	12	3.0

Wave I individual risk and protective factors of the sample are reported in Table 6. AOD-using students reported higher levels of child maltreatment with 424 (19.2%) students reporting physical abuse compared to 134 (12.0%) of non-AOD-using students. In addition, there was also greater reporting of externalizing behaviors, with 935 (33.0%) AOD-using students reporting suspensions, compared to 258 (18.0%) of non-AOD-using students. The same was seen for fighting in the AOD-using group with 971 (34.3%) students reporting fighting, compared to 285 (19.9%) students that abstained. In regard to religion, 892 (37.1%) of the AOD-using students attended religious services once a week or more when compared to 735 (56.7%) of non-AOD-using students. Finally, depressed mood and feeling the blues were also both significantly more likely in AOD

users, of whom more than 362 (12.8%) reported feeling depressed a lot or most of the time, versus 94 (6.5%) of nonusers. In addition, 307 (10.8%) of AOD users also reported feeling the blues a lot or most of the time, versus only 58 (4.0%) of nonusers.

Table 6. Wave I Individual Risk and Protective Factors for AOD-Using & Non-AOD-Using Adolescents

Predictor Variables	AOD-Using Frequency (n)	AOD-Using Percentage (%)	AOD Non-Using Frequency (n)	AOD Non-Using Percentage (%)	Test Statistic	p
<i>Physical Abuse (n=3,324) *</i>	2,202	99.9	1,122	100.0	Mann-Whitney z =-5.25	<.001
0 never happened	1,778	80.7	988	88.0		
1 one time	121	5.5	37	3.3		
2 two times	80	3.6	30	2.7		
3 three to five times	90	4.1	16	1.4		
4 six to ten times	36	1.6	12	1.1		
5 more than ten times	97	4.4	39	3.5		
<i>Sexual Abuse (n=3,330) *</i>	2,206	99.9	1,124	99.9	Mann-Whitney z =-1.81	0.07
0 never happened	2,077	94.2	1,075	95.6		
1 one time	45	2.0	17	1.5		
2 two times	18	0.8	9	0.8		
3 three to five times	27	1.2	7	0.6		
4 six to ten times	12	0.5	8	0.7		
5 more than ten times	27	1.2	8	0.7		
<i>Suspensions (n=4,263) *</i>	2,831	100.0	1,432	100.0	Chi-Square $\chi^2=106.32$	<.001

No	1,896	67.0	1,174	82.0		
Yes	935	33.0	258	18.0		
Expulsions (n=4,266) *	2,833	100.0	1,433	100.0	Chi-Square $\chi^2=18.30$	<.001
No	2,684	94.7	1,398	97.6		
Yes	149	5.3	35	2.4		
Fighting (n=4,265) *	2,832	100.0	1,433	100.0	Mann-Whitney z = -10.30	<.001
0 never	1,861	65.7	1,148	80.1		
1 once	516	18.2	195	13.6		
2 more than once	455	16.1	90	6.3		
Problems getting along w/Teachers (n=4,265) *	2,832	100.0	1,433	100.0	Mann-Whitney z = -13.11	<.001
0 never	966	34.1	756	52.7		
1 just a few times	1,308	46.2	560	39.1		
2 once a week	304	10.7	67	4.7		
3 almost everyday	178	6.3	34	2.4		
4 everyday	76	2.7	16	1.1		
Religious Service Attendance (n=3,702) *	2,405	100.0	1,297	100.0	Mann-Whitney z = -11.75	<.001
1 once a week or more	892	37.1	735	56.7		
2 once a month or more	597	24.8	276	21.3		
3 less than once a month	600	25.0	182	14.0		
4 never	316	13.1	104	8.0		
Religion Imp. (n=3,702) *	2,404	100.0	1,298	100.0	Mann-Whitney z = -12.05	<.001
1 very important	971	40.4	792	61.0		
2 fairly important	1,095	45.5	413	31.8		
3 fairly unimportant	230	9.6	56	4.3		

4 not important	108	4.5	37	2.9		
<i>Religion How Often Pray (n=3,701) *</i>	2,406	100.0	1,295	100.0	Mann-Whitney z = -10.19	<.001
1 at least once a day	1,006	41.8	764	59.0		
2 at least once a week	620	25.8	280	21.6		
3 at least once a month	301	12.5	89	6.9		
4 less than once a month	267	11.1	87	6.7		
5 never	212	8.8	75	5.8		
<i>Last Felt Depressed (n=4,265) *</i>	2,833	100.0	1,432	99.9	Mann-Whitney z = -9.45	<.001
0 never or rarely	1,548	54.6	990	69.1		
1 sometimes	923	32.6	348	24.3		
2 a lot of the time	254	9.0	65	4.5		
3 most or all of the time	108	3.8	29	2.0		
<i>Had the Blues (n=4,264) *</i>	2,833	100.0	1,431	100.0	Mann-Whitney z = -9.75	<.001
0 never or rarely	1,836	64.8	1,126	78.7		
1 sometimes	690	24.4	247	17.3		
2 a lot of the time	229	8.1	43	3.0		
3 most or all of the time	78	2.7	15	1.0		

*Denotes totals for both AOD-using and non-using sample groups.

Wave I interpersonal risk and protective factors within the sample are described in Table 7. With regard to family fun and feelings of cohesiveness, the difference between the two groups was significant with 1,485(52.6%) AOD-using students reporting that their family had quite a bit or very much fun, while 1,004 (70.3%) of the non-AOD-using students reported the same feelings. With regard to having access to alcohol in the home,

more AOD-using students reported having alcohol made easily available to them compared to their non-using peers at 997 (35.2%) students and 307 (21.4%) students respectively. Similar results were also observed for AOD-using students who reported that three of their best friends used alcohol at least once a month at 972 (34.5%) students, compared to 79 (5.6%) of non-AOD-using students. In addition, 889 (62.7%) non-AOD-using students reported that they had “no friends” who used alcohol at least once a month compared to 557 (19.8%) AOD-using students. Lastly, AOD-using students were less likely to report that none of their best friends used marijuana at least once a month at 1,394 (49.5%) compared to 1,215 (85.7%) of non-AOD-using students.

Table 7. Wave I Interpersonal Risk and Protective Factors for AOD-Using & Non-AOD-Using Adolescents

Predictor Variables	AOD-Using Frequency (n)	AOD-Using Percentage (%)	AOD Non-Using Frequency (n)	AOD Non-Using Percentage (%)	Test Statistic	p
<i>Family Cohesiveness (Having Fun) (n=4,254) *</i>	2,825	100.0	1,429	100.0	Mann-Whitney z =12.17	<.001
1 not at all	84	3.0	22	1.5		
2 very little	331	11.7	93	6.5		
3 somewhat	925	32.7	310	21.7		
4 quite a bit	1,010	35.8	587	41.1		
5 very much	475	16.8	417	29.2		
<i>Choose Own Weekend Curfew (n=4,162) *</i>	2,749	100.0	1,413	100.0	Chi-Square $\chi^2=4.38$.04
No	1,685	61.3	913	64.6		
Yes	1,064	38.7	500	35.4		
<i>Choose Own Friends (n=4,164) *</i>	2,752	100.0	1,412	100.0	Chi-Square $\chi^2=8.16$.004

No	318	11.6	207	14.7		
Yes	2,434	88.4	1,205	85.3		
Alcohol Accessible at Home (n=4,264) *	2,832	100.0	1,432	100.0	Chi-Square $\chi^2=84.90$	<.001
No	1,835	64.8	1,125	78.6		
Yes	997	35.2	307	21.4		
Drugs Accessible at Home (n=4,265) *	2,833	100.0	1,432	100.0	Chi-Square $\chi^2=30.90$	<.001
No	2,711	95.7	1,416	98.9		
Yes	122	4.3	16	1.1		
Alcohol Best Friends (n=4,235) *	2,817	100.0	1,418	100.0	Mann-Whitney z = -29.66	<.001
0 no friends	557	19.8	889	62.7		
1 one friend	709	25.2	320	22.5		
2 two friends	579	20.5	130	9.2		
3 three friends	972	34.5	79	5.6		
Marijuana Best Friends (n=4,235) *	2,818	100.0	1,417	100.0	Mann-Whitney z = -23.31	<.001
0 no friends	1,394	49.5	1,215	85.7		
1 one friend	627	22.2	137	9.7		
2 two friends	384	13.6	40	2.8		
3 three friends	413	14.7	25	1.8		

*Denotes totals for both AOD-using and non-using sample groups.

Wave I environmental risk and protective factors within the sample are described in Table 8. In regard to feeling happy at school, a greater percentage of non-AOD-using students felt happier with 437 students (30.5%) compared to their AOD-using counterparts with 558 students (19.7%). In addition, non-AOD-using students also

reported greater happiness with their neighborhoods with 528 students (36.9%) compared to 799 (28.2%) AOD-using students. In terms of feeling safe at school, there was a significant difference between the two groups with 659 (23.3%) of AOD-using students stating that they strongly agreed, while 393 (27.4%) of non-AOD-using students felt the same. Finally, regarding their feelings of safety within their neighborhood, 2,581 AOD-using students (91.2%) reported that they felt safe in their neighborhood, while 1,275 of non-AOD-using students (89.3%) also expressed feeling safe.

Table 8. Wave I Environmental Risk and Protective Factors for AOD-Using & Non-AOD-Using Adolescents

Predictor Variables	AOD-Using Frequency (n)	AOD-Using Percentage (%)	AOD Non-Using Frequency (n)	AOD Non-Using Percentage (%)	Test Statistic	<i>p</i>
<i>Happy w/ School (n=4,264) *</i>	2,832	99.9	1,432	100.0	Mann-Whitney z =-11.24	<.001
1 strongly agree	558	19.7	437	30.5		
2 agree	1,117	39.4	639	44.6		
3 neither agree nor disagree	556	19.6	199	13.9		
4 disagree	397	14.0	107	7.5		
5 strongly disagree	204	7.2	50	3.5		
<i>Feel Safe at School (n=4,265) *</i>	2,832	100.0	1,432	100.0	Mann-Whitney z =-4.69	<.001
1 strongly agree	659	23.3	393	27.4		
2 agree	1,279	45.2	680	47.5		
3 neither agree nor disagree	514	18.1	222	15.5		
4 disagree	268	9.5	111	7.7		
5 strongly disagree	112	3.9	27	1.9		

disagree						
Happy w/ Neighborhood (n=4,263) *	2,831	100.0	1,432	100.0	Mann-Whitney z =5.33	<.001
1 not at all	80	2.8	40	2.8		
2 very little	166	5.9	89	6.2		
3 somewhat	701	24.8	263	18.4		
4 quite a bit	1,085	38.3	512	35.7		
5 very much	799	28.2	528	36.9		
Feel Safe in Neighborhood (n=4,258) *	2,831	100.0	1,427	100.0	Chi-Square $\chi^2= 3.68$	0.06
No	250	8.8	152	10.7		
Yes	2,581	91.2	1,275	89.3		

*Denotes totals for both AOD-using and non-using sample groups.

Statistically Significant Differences Between Groups-Wave I

In summary, boys, older students, and those in the higher grades were more likely to use AODs (Table 1). Reported AOD use also varied significantly by race/ethnicity. In addition, students who reported higher frequencies of ranked physical abuse, school suspensions and expulsions, fighting, and problems getting along with teachers experienced greater AOD use (Table 6). Similarly, students who reported lower levels of religious activity, higher levels of depressed mood, or lower levels of family cohesiveness and parental supervisions, were more likely to report AOD use. Higher access to alcohol and drugs at home and greater AOD use among close peers were also significantly associated with AOD use (Table 7). Conversely, reporting higher levels happiness and safety in school and neighborhood was strongly associated with AOD non-use (Table 8).

Wave IV Data

The Wave IV public-use dataset sample consisted of 5,114 respondents interviewed at home between 2007 and 2008 (Kelley & Peterson, 1997). From the original Wave I dataset sample (n=6,504), 5,114 respondents were re-interviewed in Wave IV; 21.4%, n=1,390 were lost to follow-up.

Wave IV Descriptive Statistics

Wave IV demographic characteristics for the sample are described in Table 9. The total number of individuals who were in the original study sample totaled 3,368 from 4,351 (22.6%, n=983 lost to follow-up). The number of adults that were in the AOD-using adolescent group totaled 2,233 while the number of adults in the non-AOD-using adolescent group totaled 1,135. In regard to gender, the AOD-using group had 1,178 (52.8%) females and 1,055 (47.2%) males. In the non-AOD-using group there were 631 (55.6%) females and 504 (44.4%) males. The mean age for the AOD-using group was 28.97 years (ranging from 26 to 32 years, SD=1.24) while the mean age for the non-AOD-using adolescents was 28.67 years (ranging from 26 to 33 years, SD=1.28).

As shown in Table 9, the majority of the sample was made up of non-Latino White students with 1,402 (63.0%) in the AOD-using group and 607 (53.7%) in the non-AOD-using non-Latino White students in the sample. The next largest racial/ethnic group were non-Latino Black or African-American students with 398 (17.9%) AOD-using and 322 (28.5%) non-AOD-using students respectively. The remaining students in both sample groups were comprised of Latino, non-Latino Multi-Racial, non-Latino

Asian, and non-Latino Native-American or American Indian students. Overall, there were 12 missing cases from the sample regarding race/ethnicity.

Table 9. Wave IV Adult Demographic Characteristics for Wave I AOD-Using & Non-AOD-Using Adolescents

Predictor Variables	AOD-Using Frequency (n)	AOD-Using Percentage (%)	Non-AOD Using Frequency (n)	Non-AOD Using Percentage (%)	Test Statistic	p
Gender (n=3,368) *	2,233	100.0	1,135	100.0	Chi-Square $\chi^2 = 2.44$	0.12
Male	1,055	47.2	504	44.4		
Female	1,178	52.8	631	55.6		
Age (years) (n=3,368) *	2,233	100.0	1,135	99.9	T-Test t= 6.66	<.001
26	13	.6	15	1.3		
27	295	13.2	218	19.2		
28	510	22.8	320	28.2		
29	596	26.7	257	22.6		
30	589	26.4	240	21.1		
31	203	9.1	73	6.4		
32	27	1.2	11	1.0		
33	0	0	1	.1		
	Mean 28.97	SD \pm 1.24	Mean 28.67	SD \pm 1.28		
Race/Ethnicity (n=3,356) *	2,226	66.3	1,130	33.7	Chi-Square $\chi^2 = 54.59$	<.001
Non-Latino White	1,402	63.0	607	53.7		
Non-Latino Black	398	17.9	322	28.5		
Non-Latino Native	12	.5	4	.4		
Non-Latino Asian	61	2.7	39	3.5		
Non-Latino Multi-Racial	116	5.2	45	4.0		

Latino	237	10.6	113	10.0		
--------	-----	------	-----	------	--	--

*Denotes totals for both AOD-using and non-AOD-using sample groups.

Wave IV outcome variables for the sample are described in Table 10. With regard to education, there was a higher percentage of college graduates (n=331, 29.2%) and also graduates with professional degrees beyond college (n=148, 13%) in the non-AOD-using group, when compared to the AOD-using group (n=499, 22.3%; n=182, 8.2%). In addition, the AOD-using group had 354 (16.8%) members in the highest income bracket at \$100,000 or more, compared to the non-AOD-using group with 181 (17.1%). Finally, those adults who used AODs as adolescents had more involvement with the criminal justice system (n=716, 32.3%) compared to those adults who had not used AODs as adolescents (n=199, 17.6%).

Table 10. Wave IV Adult Outcomes for Wave I AOD-Using & Non-AOD-Using Adolescents

Outcome Variables	AOD-Using Frequency (n)	AOD-Using Percentage (%)	AOD Non-Using Frequency (n)	AOD Non-Using Percentage (%)	Test Statistic	p
<i>Educational Attainment (n=3,368) *</i>					Mann-Whitney z = 6.05	<.001
1 No HS	137	6.1	46	4.1		
2 HS diploma	365	16.3	174	15.3		
3 HS+ Tech	1,050	47.0	436	38.4		
4 College Degree	499	22.3	331	29.2		
5 Professional Degree	182	8.2	148	13.0		
<i>Occupation (n=3,301) *</i>					Mann-Whitney	<.001
	2,194	100.0	1,107	100.0		

					z = 4.41	
1 Zone 1†	176	8.0	84	7.6		
2 Zone 2	693	31.6	295	26.6		
3 Zone 3	638	29.1	292	26.4		
4 Zone 4	582	26.5	343	31.0		
5 Zone 5	105	4.8	93	8.4		
Household Income‡ (n=3,166) *	2,110	100.0	1,056	99.9	Mann- Whitney z= -0.58	0.56
1 < \$29,999	428	20.3	222	21.0		
2 \$30- 49,999	471	22.3	240	22.7		
3 \$50- 74,999	524	24.8	263	24.9		
4 \$75- 99,999	333	15.8	150	14.2		
5 ≥ \$100,000	354	16.8	181	17.1		
Involvement in Criminal Justice System (n=3,347) *	2,215	100.0	1,132	100.0	Chi- Square χ ² =81.99	<.001
No	1,499	67.7	933	82.4		
Yes	716	32.3	199	17.6		

*Denotes totals for both AOD-using and non-using sample groups.

†Zone levels are indicative of amount of education and training needed for each occupation with 1 as the lowest level (no high school diploma needed) to 5 the highest level (post-bachelor's professional degree required) **See appendix for detailed explanations for all zone levels.

‡ Income in thousands.

Wave IV adult outcomes with regard to race/ethnicity are described in Table 11.

With regard to education, among adolescents who were AOD users, non-Latino Asian students had the highest percentage of college graduates (n=28, 45.9%) in their collective racial group, while non-Latino Native American or American Indian students had the lowest percentage (n=1, 8.3%). Non-Latino Multi-Racial students experienced the

highest percentage of graduates with professional degrees beyond college (n=11, 9.5%), followed by non-Latino Black or African American students (n=36, 9.0%).

Among adults who had been AOD users, non-Latino Asians experienced the highest occupational status with occupations in Zone 4 (n=28, 45.9%) and Zone 5 (n=6, 9.8%). The same was observed for household income at Wave IV. Non-Latino Asian students had the highest percentage of members (46.7%, n=28) in their collective group with \$100,000 or higher. By contrast, non-Latino Black or African American students had the lowest percentage (n=35, 9.5%). Finally, with regard to involvement with the criminal justice system, non-Latino Native American or American Indian students who used AODs experienced the highest percentage (n=8, 66.7%). This was followed by non-Latino Black or African American students (n=150, 38.7%), while non-Latino Asian students experienced the lowest involvement (n=11, 17.7%).

Table 11. Wave IV Adult Outcomes by Race/Ethnicity for Wave I AOD-Using Adolescents

Outcome Variables	Non-Latino White		Non-Latino Black		Non-Latino Native		Non-Latino Asian		Non-Latino Multi-Racial		Latino	
	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%
<i>Educational Attainment (n=2,226) *</i>	1,402		398		12		61		116		237	
1 No HS	79	5.6	32	8.0	1	8.3	1	1.6	9	7.8	13	5.5
2 HS diploma	228	16.3	56	14.1	4	33.3	7	11.5	15	12.9	54	22.8
3 HS+ Tech	642	45.8	200	50.3	6	50.0	20	32.8	55	47.4	126	53.2
4 College Degree	335	23.9	74	18.6	1	8.3	28	45.9	26	22.4	33	13.9
5 Professional Degree	118	8.4	36	9.0	0	0	5	8.2	11	9.5	11	4.6

Occupation† (n=2,187) *	1,379		391		12		61		113		231	
1 Zone 1	107	7.8	41	10.5	2	16.7	1	1.6	12	10.6	11	4.8
2 Zone 2	436	31.6	134	34.3	4	33.3	11	18.0	33	29.2	73	31.6
3 Zone 3	391	28.4	107	27.4	3	25.0	15	24.6	37	32.7	84	36.4
4 Zone 4	374	27.1	93	23.8	3	25.0	28	45.9	25	22.1	57	24.7
5 Zone 5	71	5.1	16	4.1	0	0	6	9.8	6	5.3	6	2.6
Household Income‡ (n=2,105) *	1,338		369		10		60		110		218	
1 < \$29,999	233	17.4	127	34.4	3	30.0	7	11.7	22	20.0	35	16.1
2 \$30- 49,999	290	21.7	92	24.9	3	30.0	7	11.7	17	15.5	62	28.4
3 \$50- 74,999	347	25.9	78	21.1	3	30.0	11	18.3	31	28.2	54	24.8
4 \$75- 99,999	236	17.6	37	10.0	0	0	7	11.7	21	19.1	32	14.7
5 ≥ \$100,000	232	17.3	35	9.5	1	10.0	28	46.7	19	17.3	35	16.1
Involvement in Criminal Justice System (n=2,208) *	1,398		388		12		61		114		235	
No	977	69.9	238	61.3	4	33.3	50	82.0	76	66.7	149	63.4
Yes	421	30.1	150	38.7	8	66.7	11	18.0	38	33.3	86	36.6

*Denotes totals for both AOD-using and non-using sample groups.

†Zone levels are indicative of amount of education and training needed for each occupation with 1 as the lowest level (no high school diploma needed) to 5 the highest level (post-bachelor's professional degree required) **See appendix for detailed explanations for all zone levels.

‡ Income in thousands.

Wave IV adult outcomes for the non-AOD-using adolescent group with regard to racial/ethnicity are described in Table 12. With regard to educational attainment, as observed with the AOD-using group, non-Latino Asian students had the highest percentage of college graduates (n=15, 38.5%). Non-AOD-using non-Latino White students (n=88, 14.5%) students experienced the highest percentage of graduates with professional degrees beyond college, followed by non-Latino Asian students (n=5,

12.8%). In addition, non-Latino Asian students also had the highest percentage of occupations in Zone 4 (n=17, 47.2%) while non-Latino White students had the highest percentage of occupations in Zone 5 (n=63, 10.5%).

In the area of household income at Wave IV, non-AOD-using non-Latino Asian students had the highest percentage of members who obtained a household income of \$100,000 or higher (n=13, 37.1%). This was followed by Latino students (n=19, 18.8%). Finally, with regard to involvement with the criminal justice system, non-Latino Native American or American Indian students who did not use AODs at Wave I experienced the highest percentage of involvement (n=2, 50%). This was followed by non-Latino Multi-Racial or “Other” with 24.4% (n=11). Non-AOD-using Latino students had the lowest percentage of members who had involvement with the criminal justice system with 10.6% (n=12).

Table 12. Wave IV Adult Outcomes by Race/Ethnicity for Wave I Non-AOD-Using Adolescents

Outcome Variables	Non-Latino White		Non-Latino Black		Non-Latino Native		Non-Latino Asian		Non-Latino Multi-Racial		Latino	
	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%
<i>Educational Attainment (n=1,130) *</i>	607		322		4		39		45		113	
1 No HS	19	3.1	13	4.0	0	0	2	5.1	1	2.2	10	8.8
2 HS diploma	84	13.8	55	17.1	3	75.0	5	12.8	4	8.9	22	19.5
3 HS+ Tech	210	34.6	140	43.5	1	25.0	12	30.8	25	55.6	46	40.7
4 College Degree	206	33.9	74	23.0	0	0	15	38.5	11	24.4	25	22.1
5 Professional Degree	88	14.5	40	12.4	0	0	5	12.8	4	8.9	10	8.8
<i>Occupation† (n=1,102) *</i>	599		310		4		36		45		108	

1 Zone 1	42	7.0	24	7.7	1	25.0	2	5.6	6	13.3	9	8.3
2 Zone 2	138	23.0	107	34.5	1	25.0	11	30.6	6	13.3	29	26.9
3 Zone 3	154	25.7	83	26.7	2	50.0	6	16.7	12	26.7	34	31.5
4 Zone 4	202	33.7	72	23.2	0	0	17	47.2	18	40.0	34	31.5
5 Zone 5	63	10.5	24	7.7	0	0	0	0	3	6.7	2	1.9
Household Income† (n=1,051) *	575		296		3		35		41		101	
1 < \$29,999	94	16.3	95	32.1	2	66.7	3	8.6	9	22.0	17	16.8
2 \$30-49,999	132	23.0	64	21.6	0	0	6	17.1	12	29.3	24	23.8
3 \$50-74,999	155	27.0	68	23.0	1	33.3	6	17.1	7	17.1	25	24.8
4 \$75-99,999	88	15.3	31	10.5	0	0	7	20	8	19.5	16	15.8
5 ≥ \$100,000	106	18.4	38	12.8	0	0	13	37.1	5	12.2	19	18.8
Involvement in Criminal Justice System (n=1,127) *	606		320		4		39		45		113	
No	513	84.7	245	76.6	2	50.0	34	87.2	34	75.6	101	89.4
Yes	93	15.3	75	23.4	2	50.0	5	12.8	11	24.4	12	10.6

*Denotes totals for both AOD-using and non-using sample groups.

†Zone levels are indicative of amount of education and training needed for each occupation with 1 as the lowest level (no high school diploma needed) to 5 the highest level (post-bachelor's professional degree required) **See appendix for detailed explanations for all zone levels.

‡ Income in thousands.

Wave IV adult outcomes pertaining to gender are described in Table 13. With regard to educational attainment, there was a greater percentage of AOD-using females who earned bachelor degrees (n=292, 24.8%) and advanced degrees (n=118, 10.0%) when compared to AOD-using males who also earned bachelor's degrees (n=207, 19.6%) or advanced degrees (n= 64, 6.1%). A greater percentage of AOD-using females also held occupations in Zone 4 (n=342, 29.6%) or in Zone 5 (n=64, 5.5%) compared to males. As observed in both the AOD-using and non-AOD-using groups, males experienced higher percentages than females with regard to household income of \$75,000 to \$99,999 and \$100,000 or more. Finally, females in both groups had lower percentages with regard to involvement with the criminal justice system however than did males.

Table 13. Wave IV Adult Outcomes by Gender for Wave I AOD-Using & Non-AOD-Using Adolescents

Outcome Variables	Male				Female			
	AOD Use		Non-AOD-Use		AOD Use		Non-AOD-Use	
<i>Educational Attainment</i> (n=3,368) *	(n=1,055)		(n=504)		(n=1,178)		(n=631)	
	(n)	%	(n)	%	(n)	%	(n)	%
1 No HS	89	8.4	20	4.0	48	4.1	26	4.1
2 HS diploma	201	19.1	97	19.2	164	13.9	77	12.2
3 HS+	494	46.8	190	37.7	556	47.2	246	39.0
4 College Degree	207	19.6	146	29.0	292	24.8	185	29.3
5 Professional Degree	64	6.1	51	10.1	118	10.0	97	15.4
<i>Occupation</i> † (n=3,301) *	(n=1,037)		(n=492)		(n=1,157)		(n=615)	
1 Zone 1	72	6.9	36	7.3	104	9.0	48	7.8
2 Zone 2	404	39.0	150	30.5	289	25.0	145	23.6
3 Zone 3	280	27.0	124	25.2	358	30.9	168	27.3
4 Zone 4	240	23.1	150	30.5	342	29.6	193	31.4
5 Zone 5	41	4.0	32	6.5	64	5.5	61	9.9
<i>Household Income</i> ‡ (n=3,166) *	(n=995)		(n=469)		(n=1,115)		(n=587)	
1 < \$29,999	182	18.3	89	19.0	246	22.1	133	22.7
2 \$30-49,999	225	22.6	106	22.6	246	22.1	134	22.8
3 \$50-74,999	245	24.6	109	23.2	279	25.0	154	26.2
4 \$75-99,999	161	16.2	76	16.2	172	15.4	74	12.6
5 ≥ \$100,000	182	18.3	89	19.0	172	15.4	92	15.7
<i>Involvement in Criminal Justice System</i> (n=3,347) *	(n=1,040)		(n=504)		(n=1,175)		(n=628)	
No	556	53.5	367	72.8	943	80.3	566	90.1
Yes	484	46.5	137	27.2	232	19.7	62	9.9

*Denotes totals for both AOD-using and non-using sample groups.

†Zone levels are indicative of amount of education and training needed for each occupation with 1 as the lowest level (no high school diploma needed) to 5 the highest level (post-bachelor's professional degree required) **See appendix for detailed explanations for all zone levels.

‡ Income in thousands.

Statistically Significant Differences Between Groups- Wave IV

The statistically significant differences between the AOD-using and non-AOD-using groups with regard to adult Wave IV outcomes are described in Tables 9-10. Results indicated the following statistically significant findings: higher adult age experienced greater AOD use an adolescent ($t=6.66$, $p<.001$); non-Latino Native American or American Indian, followed by non-Latino Multi-Racial students were more likely to have used AODs as an adolescent ($\chi^2= 54.59$, $p<.001$); adults who were non-AOD-using adolescents ranked higher in educational attainment ($z=6.05$, $p<.001$); adults who were non-AOD-using adolescents ranked higher in occupational status ($z=4.41$, $p<.001$); adults who were AOD-using adolescents more likely to have involvement in the criminal justice system ($\chi^2=81.99$, $p<.001$).

Post Hoc Analyses

Post hoc analyses were conducted to test the statistical significance of differences between genders as well as differences between racial/ethnic groups within the AOD-using student sample. With regard to gender, Mann Whitney (Wilcoxon Rank-Sum) and Chi-Square tests showed that AOD-using females ranked higher in adult educational attainment ($z=-6.33$, $p<.001$); AOD-using females ranked higher in adult occupational status ($z=-4.79$, $p<.001$); AOD-using males ranked higher in adult household income ($z=2.25$, $p<.05$); AOD-using males were more likely to have involvement in the criminal justice system ($\chi^2= 181.05$, $p<.001$); and AOD-using non-Latino Native American or American Indian, followed by non-Latino Black or African American students were more likely to have involvement with the criminal justice system ($\chi^2= 24.41$, $p<.001$).

Post hoc Kruskal-Wallis tests were conducted to test for statistically significant differences between racial/ethnic groups within the AOD-using sample. Results showed statistically significant differences with regard to educational attainment ($H=27.13$, $p<.001$), occupational status ($H=22.25$, $p<.001$), and household income ($H=80.47$, $p<.001$). Mann-Whitney (Wilcoxon Rank-Sum) and Chi-Square tests were then conducted to determine significance between pairs (Field, 2005). Four pairs were tested with regard to race/ethnicity. Non-Latino White and non-Latino Black or African American groups were tested as a pair, non-Latino White and non-Latino Asian groups were also tested as a pair, non-Latino Black or African American and non-Latino Native American or American Indian groups were tested as a pair, and finally, Latino and non-Latino Multi-Racial groups were tested as a pair. A *Bonferroni correction* was used to prevent Type I errors and alpha was set at .0125 for statistical significance based on .05 divided by 4, the number of tests conducted.

Results indicated the following statistically significant findings: AOD-using non-Latino White students experienced greater household income ($z=7.76$, $p<.0125$) and lower involvement with the criminal justice system ($\chi^2= 10.20$, $p<.0125$) when compared to AOD-using non-Latino Black or African American students. In addition, AOD-using non-Latino Asian students experienced greater educational attainment ($z=-3.01$, $p<.0125$), occupational status ($z=-3.96$, $p<.0125$), and household income ($z=-4.05$, $p<.0125$) when compared to AOD-using non-Latino White students. There were no statistically significant differences found between non-Latino Black or African American and non-Latino Native American or American Indian groups. Finally, there were also no

statistically significant differences found between Latino and non-Latino Multi-Racial groups.

Study Aims & Hypotheses

Study Aim 1

To statistically compare the adult life outcomes (Wave IV) of AOD-using adolescents (Wave I) with the adult life outcomes (Wave IV) of non-AOD-using adolescents (Wave I).

Hypothesis 1a – There is a significant difference between the distributions of the AOD-using and non-AOD-using adolescent groups (Wave I) with regard to the primary adult life outcomes (Wave IV) of *educational attainment* and *occupational status*.

Comparing Differences Between Groups

Educational Attainment

Ho: The AOD-using group and the non-AOD-using group are identically distributed in regard to their level of educational achievement.

Ha: The AOD-using group and the non-AOD-using group are not identically distributed in regard to their level of educational achievement.

A Mann-Whitney (Wilcoxon Rank-Sum) test was used to test the difference in distributions between the Wave I AOD-using and non-AOD-using independent groups with regard to their educational attainment in Wave IV. Alpha was set at a significance level of .001 and the difference between the distributions of the two groups was determined to be significant ($z=6.05$, $p<.001$). Non-AOD-using students ranked statistically significantly higher than AOD-using students in their levels of educational

attainment. Based on the results, null hypothesis 1a, which stated that the AOD-using and non-AOD-using groups would be identically distributed in their level of educational achievement, was rejected.

Occupational Status

Ho: The AOD-using group and the non-AOD-using group are identically distributed in regard to their occupational status.

Ha: The AOD-using group and the non-AOD-using group are not identically distributed in regard to their occupational status.

A Mann-Whitney (Wilcoxon Rank-Sum) Test was used to test the difference in distributions between the Wave I AOD-using and non-AOD-using independent groups with regard to their occupational status in Wave IV. Alpha was set at a significance level of .001 and the difference between the distributions of the two groups was determined to be significant ($z=4.41$, $p<.001$). Non-AOD-using students ranked statistically significantly higher than AOD-using students in their levels of occupational status. Based on the results, null hypothesis 1a, which stated that the AOD-using and non-AOD-using groups would be identically distributed in their level of occupational status, was rejected.

Hypothesis 1b – There is a significant difference between the AOD-using and non-AOD-using adolescent groups (Wave I) with regard to the secondary adult life outcomes (Wave IV) of *household income* and *involvement with the criminal justice system*.

Household Income

Ho: The AOD-using group and the non-AOD-using group are identically distributed in regard to their household income.

Ha: The AOD-using group and the non-AOD-using group are not identically distributed in regard to their household income.

A Mann-Whitney (Wilcoxon Rank-Sum) Test was used to test the difference in distributions between the Wave I AOD-using and non-AOD-using independent groups with regard to their household income in Wave IV. Alpha was set at a significance level of .001 and the difference between the distributions of the two groups was determined not to be significant ($z = -0.58, p > 0.001$). Based on the results, null hypothesis 1b, which stated that the AOD-using and non-AOD-using groups would be identically distributed in their level of household income, was not rejected.

Criminal Justice System

Ho: The proportions of the AOD-using group and the non-AOD-using group are identically distributed in regard to their involvement with the criminal justice system.

Ha: The proportions of the AOD-using group and the non-AOD-using group are not identically distributed in regard to their involvement with the criminal justice system.

A chi-square test was used to test the difference in proportions of Wave I AOD-using and non-AOD-using independent groups with regard to their involvement with the criminal justice system in Wave IV. Alpha was set at a significance level of .001 and the difference in the proportions of the two groups was determined to be significant ($\chi^2 \{1\}$)

=81.99, $p < .001$). AOD-using students were statistically significantly more likely than AOD-using students to have involvement in the criminal justice system. Based on the results, null hypothesis 1b, which stated that the proportions of the AOD-using and non-AOD-using groups would be identically distributed with regard to their involvement in the criminal justice system, was rejected.

Study Aim 2

To identify risk and protective factors (Wave I) associated with adult *Educational Attainment and Occupational Status* (Wave IV-primary outcomes) in AOD-using adolescents.

Ordinal Logistic Regression

Ordinal Logistic Regression was conducted to test the effect ($\alpha = 0.05$) of each Wave I independent variable within the model for predicting *Educational Attainment and Occupational Status*.

Predicting Adult Educational Attainment for AOD-Using Adolescents

Table 14 describes the Wave I individual, interpersonal, and environmental variables in Model 1 ($F=19.05\{96\}$, $p < .001$) which were statistically significant in predicting educational attainment at Wave IV. Mother's education, father's education, and parental income at Wave I were controlled for in Model 1. Alpha was set at a significance level of .05. There were 925 (41.4% of AOD-using group, $n=2,233$) respondents included in the subpopulation analysis who had complete data for Wave I, Wave IV, and all variables included in the model. Respondents missing data totaled 1,308 (58.6% of AOD-using group, $n=2,233$).

Gender was found to be statistically significant and positively associated with adult educational attainment (OR=1.50, 95% CI 1.10-1.95, $p<0.05$). Male sex was found to be a risk factor for those adolescents who used AODs in Wave I and was associated with lower educational attainment in Wave IV. Male adolescents using AODs were found to be 1.50 times more likely to have lower adult educational achievement compared to female adolescents who also used AODs. Wave I Age was also found to be statistically significant and inversely associated (higher age represented by lower values) with adult educational attainment (OR=0.57, 95% CI 0.45-0.71, $p<0.001$). Higher age at the time of the study was found to be protective for AOD-using adolescents in Wave I against lower educational attainment in Wave IV. In addition, Grade level was also found to be statistically significant and positively associated with adult educational attainment (OR=2.30, 95% CI 1.75-3.02, $p<0.001$). Lower grade level at the time of the study was found to be a risk factor for AOD-using adolescents in Wave I and was associated with lower educational attainment in Wave IV. Adolescents in lower grades who used AODs were found to be 2.30 times more likely to have lower educational achievement in Wave IV when compared to adolescents also using AODs in higher grade levels.

In terms of religiosity, Importance of Religion was found to be statistically significant and positively associated with adult educational attainment (OR=1.34, 95% CI 1.08-1.65, $p<0.05$). Higher importance of religion (represented by lower values) in Wave I was found to be a risk factor for lower educational achievement for those adolescents who used AODs. In addition, frequency in prayer was found to be statistically significant and inversely associated with adult educational attainment (OR=.82, 95% CI .71-.94,

p<0.05). Higher frequency in praying (represented by lower values) was protective for AOD-using adolescents against lower educational attainment.

Fighting was found to be statistically significant and inversely associated with adult educational attainment (OR=.76, 95% CI .59-.97, p<0.05). Not fighting was a protective factor for AOD-using adolescents against lower educational attainment.

Suspension from school was also found to be statistically significant and inversely associated with adult educational attainment (OR=.48, 95% CI .33-.69, p<0.001). Not having been suspended from school was a protective factor for those adolescents who used AODs and was found to be associated with higher educational attainment. In addition, expulsion from school was also found to be statistically significant and inversely associated with adult educational attainment (OR=.42, 95% CI .19-.97, p<0.05). Not having been expelled from school was a protective factor for those adolescents who used AODs and was found to be associated with higher educational attainment. Finally, happiness or satisfaction in their neighborhood was found to be statistically significant and inversely associated with adult educational attainment (OR=.82, 95% CI .67-.99, p<0.05). Not being happy or satisfied in their neighborhood was a protective factor for AOD-using adolescents against lower educational attainment.

Table 14. Ordinal Logistic Regression Analyses Predicting Lower Educational Attainment in Wave IV for Wave I AOD-Using Adolescents

Predictor Variables	β	Sig.	SE	Exp (B)	95% Confidence Interval For Exp (B)	
					Lower	Upper
<i>Male Sex</i>	.38	.009	.21	1.50	1.10	1.95
<i>Higher Age</i>	-.57	.000	.07	.57	.45	.71
<i>Lower Grade Level</i>	.83	.000	.32	2.30	1.75	3.02
<i>Lower Importance of Religion</i>	.29	.008	.14	1.34	1.08	1.65
<i>Higher Frequency in Prayer</i>	-.20	.005	.06	.82	.71	.94
<i>Not Fighting</i>	-.28	.027	.09	.76	.59	.97
<i>Not Suspended</i>	-.73	.000	.09	.48	.33	.69
<i>Not Expelled</i>	-.85	.042	.18	.42	.19	.97
<i>Lower Neighborhood Happiness/Satisfaction</i>	-.20	.044	.08	.82	.67	.99

Hypotheses Testing in Predicting Educational Attainment

Ho: No independent variables in the model are useful in explaining the variability in Y, or predicting Y.

Ha: One or more independent variables in the model are useful in explaining the variability in Y or also predicting Y.

Hypothesis 2a – There is an inverse association between *male gender, child maltreatment, physical fights, feeling depressed, peer AOD use, AODs in the home (Wave I) and adult educational attainment (Wave IV)*.

Hypothesis 2b - There is a positive association between *non-Latino White race/ethnicity, religiosity, family cohesiveness, school safety, neighborhood safety (Wave I) and adult educational attainment (Wave IV)*.

Based on the results, null hypotheses 2a and 2b, which stated that the aforementioned variables would not be useful in explaining or predicting educational attainment within the model, were rejected.

Predicting Adult Occupational Status for AOD-Using Adolescents

Table 15 describes the Wave I individual, interpersonal, and environmental variables in Model 2 ($F=7.83$, $p<.001$) which were statistically significant in predicting occupational status at Wave IV. Mother's occupation, father's occupation, and parental income at Wave I were controlled for in Model 2. Alpha was set at a significance level of .05. There were 598 (26.8% of AOD-using group, $n=2,233$) respondents included in the subpopulation analysis who had complete data for Wave I, Wave IV, and all variables included in the model. Respondents missing data totaled 1,635 (73.2% of AOD-using group, $n=2,233$).

Grade level was found to be statistically significant and positively associated with adult occupational status ($OR=1.49$, 95% CI 1.14-1.95, $p<0.05$). Lower grade level at the time of the study was found to be a risk factor for AOD-using adolescents in Wave I and was associated with lower occupational status in Wave IV. Adolescents in lower grades who used AODs were found to be 1.49 times more likely to have lower occupational status in Wave IV when compared to adolescents also using AODs in higher grade levels. In addition, feeling safe at school was also statistically significant and inversely associated with occupational status ($OR=.81$, 95% CI .67-.97, $p<0.05$). Feeling safe at school was found to be a protective factor for those adolescents who used AODs in that

the safer they felt at school (represented by lower values) the higher their adult occupational status.

Table 15. Ordinal Logistic Regression Analyses Predicting Lower Occupational Status in Wave IV for Wave I AOD-Using Adolescents

Predictor Variables	β	Sig.	SE	Exp (B)	95% Confidence Interval For Exp (B)	
					Lower	Upper
<i>Lower Grade Level</i>	.40	.004	.20	1.49	1.14	1.95
<i>Higher Feeling Safe at School</i>	-.21	.024	.08	.81	.67	.97

Hypotheses Testing in Predicting Occupational Status

Ho: No independent variables in the model are useful in explaining the variability in Y, or predicting Y.

Ha: One or more independent variables in the model are useful in explaining the variability in Y or also predicting Y

Hypothesis 2c – There is an inverse association between *female gender, child maltreatment, physical fights, feeling depressed, peer AOD use, AODs in the home* (Wave I) and adult *occupational status* (Wave IV).

Hypothesis 2d - There is a positive association between *non-Latino White race/ethnicity, religiosity, family cohesiveness, school safety, neighborhood safety* (Wave I) and adult *occupational status* (Wave IV).

Based on the results, null hypothesis 2c, which stated that the aforementioned variables would not be useful in explaining or predicting occupational status within the model, was accepted. In addition, null hypothesis 2d, which stated that the

aforementioned variables would not be useful in explaining or predicting occupational status within the model, was rejected.

Study Aim 3

To identify risk and protective factors (Wave I) associated with adult *Involvement with the Criminal Justice System and Household Income* (Wave IV-secondary outcomes) in the AOD-using adolescent group.

Ordinal Logistic Regression was conducted to test the effect ($\alpha = 0.05$) of each Wave I independent variable within the model for predicting *Household Income*.

Predicting Adult Household Income for AOD-Using Adolescents

There were no Wave I individual, interpersonal, or environmental variables in Model 3 ($F=2.42\{93\}$, $p<0.05$) that were statistically significant in predicting household income at Wave IV. Mother's occupation, father's occupation, and parental income at Wave I were controlled for in Model 3. Alpha was set at a significance level of .05. There were 577 (25.8% of AOD-using group, $n=2,233$) respondents included in the subpopulation analysis who had complete data for Wave I, Wave IV, and all variables included in the model. Respondents missing data totaled 1,656 (74.2% of AOD-using group, $n=2,233$).

Hypotheses Testing in Predicting Household Income

Ho: No independent variables in the model are useful in explaining the variability in Y, or predicting Y.

Ha: One or more independent variables in the model are useful in explaining the variability in Y or also predicting Y.

Hypothesis 3a – There is an inverse association between *female gender, child maltreatment, physical fights, feeling depressed, peer AOD use, AODs in the home* (Wave I) and *adult household income* (Wave IV).

Hypothesis 3b - There is a positive association between *religiosity, family cohesiveness, school safety, neighborhood safety* (Wave I) and *adult household income* (Wave IV).

Based on the results, null hypotheses 3a and 3b, which stated that the aforementioned variables would not be useful in explaining or predicting household income within the model, were not rejected.

Binomial Logistic Regression

Binomial Logistic Regression was conducted to test the effect ($\alpha = 0.05$) of each Wave I independent variable within the model for predicting *Involvement with the Criminal Justice System*.

Predicting Adult Criminal Justice System Involvement for AOD-Using Adolescents

Table 16 describes the Wave I individual, interpersonal, and environmental variables in Model 4 ($F=7.69\{101\}$, $p<.001$) which were statistically significant in predicting involvement with the criminal justice system at Wave IV. Mother's imprisonment, father's imprisonment, and parental income at Wave I were controlled for in Model 4. Alpha was set at a significance level of .05. There were 1,294 (57.9% of AOD-using group, $n=2,233$) respondents included in the subpopulation analysis who had complete data for Wave I, Wave IV, and all variables included in the model. Respondents missing data totaled 939 (42.1% of AOD-using group, $n=2,233$).

Gender was found to be statistically significant and inversely associated with involvement with the criminal justice system (OR=.32, 95% CI .23-.45, $p<.001$). For those that used AODs as adolescents, female sex in Wave I was found to be protective against having involvement with the criminal justice system in Wave IV. Fighting in Wave I was also found to be statistically significant and positively associated with involvement with the criminal justice system (OR=1.38, 95% CI 1.11-1.72, $p<0.05$). Fighting was found to be a risk factor in that those AOD-using adolescents who fought in Wave I were found to be 1.38 times more likely to have involvement with the criminal justice system in Wave IV when compared to other adolescents also using AODs who did not fight. In addition, having been suspended from school was also found to be statistically significant and positively associated with involvement with the criminal justice system (OR=1.64, 95% CI 1.12-2.42, $p<0.05$). Having been suspended from school at Wave I was found to be a risk factor for those adolescents who used AODs and made them 1.64 times more likely to be involved with the criminal justice system at Wave IV than their AOD-using peers who were not suspended.

With regard to peer influence, number of three best friends who used alcohol at least once a month was also found to be statistically significant and positively associated with involvement with the criminal justice system (OR=1.29, 95% CI 1.11-1.49, $p<0.05$). In other words, having more best friends who used alcohol at least once a month in Wave I was a risk factor and made them 1.29 times more likely to have involvement with the criminal justice system in Wave IV when compared to their AOD-using peers who did not have best friends who used alcohol at least once a month.

Table 16. Binomial Logistic Regression Analyses Predicting Higher Involvement with the Criminal Justice System in Wave IV for Wave I AOD-Using Adolescents

Predictor Variables	β	Sig.	SE	Exp (B)	95% Confidence Interval For Exp (B)	
					Lower	Upper
<i>Female Sex</i>	-1.15	.000	.05	.32	.23	.45
<i>Suspended</i>	.50	.012	.32	1.64	1.12	2.42
<i>Fighting</i>	.32	.004	.15	1.38	1.11	1.72
<i>Alcohol Best Friends</i>	.25	.001	.10	1.29	1.11	1.49

Hypotheses Testing in Predicting Criminal Justice System Involvement

Ho: No independent variables in the model are useful in explaining the variability in Y, or predicting Y.

Ha: One or more independent variables in the model are useful in explaining the variability in Y or also predicting Y.

Hypothesis 3c– There is an inverse association between *female gender, religiosity, family cohesiveness, school safety, neighborhood safety* (Wave I) and *adult involvement with the criminal justice system* (Wave IV).

Hypothesis 3d – There is a positive association between *child maltreatment, physical fights, feeling depressed, peer AOD use, AODs in the home* (Wave I) and *adult involvement with the criminal justice system* (Wave IV).

Based on the results, null hypotheses 3c and 3d, which stated that the aforementioned variables would not be useful in the model in explaining or predicting involvement with the criminal justice system, were rejected.

Predicting Adult Wave IV Outcomes for Non-AOD-Using Adolescents

Table 17 describes the individual, interpersonal, or environmental variables that were found to be risk and protective factors to those adolescents who did not use AODs in high school. Binomial and ordinal logistic regression analyses were conducted *post hoc* to predict outcome variables. Model A ($F=5.48\{100\}$, $p<.001$) predicted adult educational attainment at Wave IV. Mother's education, father's education, and parental income at Wave I were controlled for in Model A. Alpha was set at a significance level of .05. There were 538 (47.4% of non-AOD-using group, $n=1,135$) respondents included in the subpopulation analysis who had complete data for all Wave I and Wave IV variables included in the model. Respondents missing data totaled 597 (52.6% of non-AOD-using group, $n=1,135$). Age was found to be statistically significant and inversely associated (higher age represented by lower values) with adult educational attainment ($OR=.68$, 95% CI .49-.94, $p<0.05$). Higher age was a protective factor for those adolescents who did not use AODs in Wave I and was associated with higher educational attainment in Wave IV. Grade Level was also found to be statistically significant and positively associated with adult educational attainment ($OR=1.96$, 95% CI 1.32-2.93, $p<0.05$). Lower Grade Level was a risk factor and non-AOD-using adolescents in lower grades were 1.96 times more likely to have lower educational attainment in Wave IV when compared to other non-AOD-using adolescents in higher grade levels. Fighting was also found to be statistically significant and inversely associated with adult educational attainment ($OR=.57$, 95% CI .40-.83, $p<0.05$). Not fighting in Wave I was protective against lower educational attainment in Wave IV for non-AOD-using

adolescents. In addition, Choosing Own Friends was also found to be statistically significant and positively associated with adult educational attainment (OR=1.88, 95% CI 1.02-3.47, $p<0.05$). For those adolescents who did not use AODs in Wave I, Not Choosing Own Friends was a risk factor and associated with lower educational attainment in Wave IV.

Model B ($F=4.69\{100\}$, $p<.001$) predicted adult occupational status at Wave IV. Mother's occupation, father's occupation, and parental income at Wave I were controlled for in Model B. Alpha was set at a significance level of .05. There were 334 (29.4% of the non-AOD-using group, $n=1,135$) respondents included in the subpopulation analysis who had complete data for all Wave I and Wave IV variables included in the model. Respondents missing data totaled 801 (70.6% of the non-AOD-using group, $n=1,135$). Grade Level was found to be statistically significant and positively associated with adult occupational status (OR=1.46, 95% CI 1.04-2.06, $p<0.05$). Lower Grade Level was a risk factor and non-AOD-using adolescents in lower grades were 1.46 times more likely to have lower occupational status in Wave IV when compared to other non-AOD-using adolescents in higher grade levels.

Model C ($F=3.07\{99\}$, $p<.001$) predicted adult household income at Wave IV. Mother's occupation, father's occupation, and parental income at Wave I were controlled for in Model C. Alpha was set at a significance level of .05. There were 325 (28.6% of the non-AOD-using group, $n=1,135$) respondents included in the subpopulation analysis who had complete data for all Wave I and Wave IV variables included in the model. Respondents missing data totaled 810 (71.4% of the non-AOD-using group, $n=1,135$). Age was found to be statistically significant and inversely associated (higher age

represented by lower values) with adult household income (OR=.56, 95% CI .43-.73, $p<0.001$). Higher age was a protective factor for those adolescents who did not use AODs in Wave I and was associated with higher adult household income in Wave IV. Grade Level was also found to be statistically significant and positively associated with adult household income (OR=1.83, 95% CI 1.32-2.54, $p<0.001$). Lower Grade Level was a risk factor and non-AOD-using adolescents in lower grades were 1.83 times more likely to have lower household income in Wave IV when compared to other non-AOD-using adolescents in higher grade levels. Frequency in religious service attendance was found to be statistically significant and positively associated with adult household income (OR=1.67, 95% CI 1.21-2.32, $p<0.05$). Infrequently attending religious services (represented by higher values) was a risk factor for those adolescents who did not use AODs and was found to be associated with lower household income. In addition, frequency in prayer was found to be statistically significant and inversely associated with adult household income (OR=.69, 95% CI .51-.94, $p<0.05$). Higher frequency in praying (represented by lower values) was a protective factor for those adolescents who did not use AODs and was found to be associated with higher household income. Expulsion from school was also found to be statistically significant and inversely associated with adult household income (OR=.05, 95% CI .00-.80, $p<0.05$). Not having been expelled from school was a protective factor for those adolescents who did not use AODs and was found to be associated with higher household income. Finally, having the blues was also found to be statistically significant and inversely associated with adult household income (OR=.49, 95% CI .25-.96, $p<0.05$). Not having the blues was a protective factor for

those adolescents who did not use AODs and was found to be associated with higher household income.

Model D ($F=2.19\{102\}$, $p<.05$), predicted involvement with the criminal justice system at Wave IV. Mother’s imprisonment, father’s imprisonment, and parental income at Wave I were controlled for in Model D. Alpha was set at a significance level of .05. There were 724 (64% of the non-AOD-using group, $n=1,135$) respondents included in the subpopulation analysis who had complete data for all Wave I and Wave IV variables included in the model. Respondents missing data totaled 411 (36.2% of the non-AOD-using group, $n=1,135$). Gender was found to be statistically significant and inversely associated with involvement with the criminal justice system ($OR=.28$, 95% CI .16-.51, $p<.001$). For those that did not use AODs as adolescents, female sex in Wave I was found to be protective against having involvement with the criminal justice system in Wave IV. Suspension from school in Wave I was also found to be statistically significant and positively associated with involvement with the criminal justice system ($OR=2.81$, 95% CI 1.13-6.99, $p<.05$). Having been suspended from school at Wave I was a risk factor for those adolescents who did not use AODs and made them 2.81 times more likely to be involved with the criminal justice system at Wave IV than their non-AOD-using peers who were not suspended.

Table 17. Risk & Protective Factors Predicting Wave IV Outcomes for Wave I Non-AOD-Using Adolescents

Outcome Variable Wave IV	Predictor Variable Wave I	β	Sig.	SE	Exp (B)	95% Confidence Interval For Exp (B)	
						Lower	Upper
<i>Lower Educational</i>	<i>Higher Age</i>	-.39	.020	.11	.68	.49	.94

<i>Attainment</i>							
<i>Lower Educational Attainment</i>	<i>Lower Grade Level</i>	.67	.001	.40	1.96	1.32	2.93
<i>Lower Educational Attainment</i>	<i>Not Fighting</i>	-.56	.004	.11	.57	.40	.83
<i>Lower Educational Attainment</i>	<i>Not Choose Own Friends</i>	.63	.043	.58	1.88	1.02	3.47
<i>Lower Occupational Status</i>	<i>Lower Grade Level</i>	.38	.031	.25	1.46	1.04	2.06
<i>Lower Household Income</i>	<i>Higher Age</i>	-.58	.000	.07	.56	.43	.73
<i>Lower Household Income</i>	<i>Lower Grade Level</i>	.60	.000	.30	1.83	1.32	2.54
<i>Lower Household Income</i>	<i>Lower Religion Service</i>	.51	.002	.27	1.67	1.21	2.32
<i>Lower Household Income</i>	<i>Higher Religion Prayer</i>	-.37	.020	.11	.69	.51	.94
<i>Lower Household Income</i>	<i>Not Expelled</i>	-2.93	.034	.07	.05	.00	.80
<i>Lower Household Income</i>	<i>Not Having the "Blues"</i>	-.72	.039	.17	.49	.25	.96
<i>Higher Criminal Justice</i>	<i>Female Gender</i>	-1.26	.000	.08	.28	.16	.51
<i>Higher Criminal Justice</i>	<i>Suspended</i>	1.03	.027	1.29	2.81	1.13	6.99

Summary

Through quantitative analysis, the differences between the AOD-using and non-AOD-using groups of adolescents were found to be statistically significant in regard to their distributions and proportions. The present study found noticeable differences with regard to AOD use in adolescence and Wave IV outcomes. Students who did not use AODs in Wave I had the most favorable outcomes in Wave IV regarding educational attainment, occupational status, and involvement with the criminal justice system when compared to students who used AODs.

The present study also found marked racial differences in Wave IV outcomes when observing all racial groups. Non-Latino Asian and non-Latino White students who used AODs in Wave I had the most favorable outcomes in Wave IV when compared to other races/ethnicities who also used AODs. By contrast, non-Latino Native American or American Indian and non-Latino Black or African American students who used AODs in Wave I fared the worst in regard to many of these areas when compared to other groups. Regarding gender, the present study also found noticeable differences with regard to AOD use in adolescence and Wave IV outcomes. Female students who used AODs in Wave I had the most favorable outcomes in Wave IV regarding educational attainment, occupational status, and involvement with the criminal justice system when compared to male students who also used AODs.

In addition, through ordinal and binomial logistic regressions, the present study identified risk and protective factors affecting the adult outcomes of adolescents who used AODs. Gender, age, grade level, importance of religion, frequency of prayer, fighting, suspensions, expulsions, alcohol use by best friends, feeling safe in school, and

neighborhood happiness/satisfaction were all found to be statistically significant in predicting Wave IV outcomes including educational attainment, occupational status, household income, and involvement with the criminal justice system.

CHAPTER V

DISCUSSION

The World Health Organization has identified alcohol and other drug use as a significant public health concern for all youth around the globe (World Health Organization, 2014). Despite recent declines in overall adolescent AOD use, (National Institute on Drug Abuse, 2014) there are still grounds for concern due to their substantial influence on the lives of young people. The effects of adolescent AOD use often produces problems which greatly influence their immediate health, while also creating lasting consequences for the future (Johnston, O'Malley, Bachman, & Schulenberg, 2010). In light of these concerns, the intent of the present study was to discover information that would be useful in improving health promotion interventions geared towards prevention. By examining the outcomes of adults who used AODs as adolescents, and comparing them to their peers who abstained, public health professionals are able to gain insight into characteristics of resiliency, as well as the formation of maladaptive behaviors (Brown et al., 2009). The development of effective interventions therefore becomes more realizable through the identification of influential risk and protective factors.

Life Course Theory (LCT) guided the present study in identifying risk and protective factors which affected the life trajectories of AOD-using adolescents (Hutchinson, Matto, Harrigan, Charlesworth, & Viggiani, 2007). LCT provides numerous benefits as a theoretical framework (Hutchinson, 2011). LCT supports an examination of human development with regard to history while simultaneously bringing

attention to social inequalities in health and other areas of society with the use of concepts such as cumulative advantage and disadvantage. In addition, LCT reinforces the premise that evolution is possible for human beings and stresses the idea of resiliency, which is crucial to developing prevention programs.

Analysis using LCT is used quite often to examine the early life events of the individual and subsequent life trajectories and outcomes (Binstock & George, 2011). The use of longitudinal data within this study made it possible for the same cohort to be followed throughout the lifespan, from adolescence into adulthood. In examining the adult outcomes of the cohort, it is important to understand their individual differences as well as their collective experience (Dannefer, 2003; Elder, 1994). Born during the late 1970s and early 1980s, the cohort grew up in the United States during the 1980s and 1990s and shared many pop-cultural, social, and historical events (Elder, 1994). They watched music videos on MTV and became familiar with new technologies including the personal computer, the internet, and the wide-spread usage of the cellular phone. This cohort witnessed the “Challenger” explosion, the destruction of the Berlin Wall, “Desert Storm,” “Y2K,” September 11th, and the first President of the United States with African ancestry being sworn into office.

As Elder, Johnson, & Creosnoe (2003) highlighted, historic events such as these act to shape the lives of the cohort. However, while these experiences were shared, the findings from this study demonstrate vastly different lives with relation to their families, economic backgrounds, and environments (Maternal and Child Health Bureau, 2010). As LCT emphasizes, the influence of multiple risk and protective factors results in cumulative advantage for some, and cumulative disadvantage for others (Arthur et al.,

2002). Ultimately, the ramifications of their AOD use, or non-use, acts as another factor in shaping their adult outcomes in the areas of educational attainment, occupational status, household income, and involvement with the criminal justice system (Elder, 1998; Hutchinson, 2011; Shanahan, 2000).

AOD-Using & Non-Using Groups

The literature on adolescent development has asserted the premise that AOD-using adolescents would fare worse as adults than their non-using counterparts (Bentler, 1992; Ellickson et al., 2004; Friedman et al., 2004; Kandel et al., 1986). This idea has been supported by research which has documented the deleterious long-term effects surrounding adolescent AOD use (Hodgins, Lövenhag, Rehn, & Nilsson, 2014; National Center on Addiction and Substance Abuse, 2011). The results from the present study were somewhat in accordance with past literature. With the exception of household income, there were statistically significant differences between the AOD-using and non-AOD-using groups with regard to all study outcomes. Non-AOD-using adolescents ranked higher in all of the adult outcomes except household income, when compared to their AOD-using counterparts. However, as the results of the study have shown, there were also many individuals who used AODs as adolescents and went on to not only avoid involvement in the criminal justice system, but to also obtain high levels of education, occupational status, and household income.

LCT illustrates the power of individuals to overcome hardships and attain success through human agency (Hutchinson, 2011). The findings of the present study similarly indicate that resilience may also be attained. AOD use is a proven risk factor (National Center on Addiction and Substance Abuse, 2011) and thwarts a positive life trajectory for

some adolescents, but not for others (K. King et al., 2006). Those students with greater cumulative advantage may still attain higher educational levels, occupational status, and household incomes despite the negative effects from AODs. The positive nature and significance of human agency in the context of these findings is important in recognizing that there is hope for adolescents who have used AODs, if there is early intervention (Carney, Myers, Louw, & Okwundu, 2014).

Individual Risk and Protective Factors & Adult Outcomes

Race/Ethnicity & Gender

The literature has stated that White adolescent males and females have higher rates of AOD use when compared to other races (Chen & Jacobson, 2012). By contrast, Black or African American adolescents have had the lowest use across the country when viewing drug and alcohol rates (Chen & Jacobson, 2012; Keyes et al., 2015; Patrick & O'Malley, 2015). The overall findings of the present study are in accord with the literature. When viewing AOD usage and non-usage by racial group, the highest AOD-usage was observed in the non-Latino Native-American or American Indian racial/ethnic group with 17 (77.3%) students. This was followed by the non-Latino White racial/ethnic group with 1,739 (70.5%) students. The highest non-AOD use included the non-Latino Black or African-American students with 413 (44.3%) adolescents. In this study, the non-Latino Native-American or American Indian racial/ethnic group had the highest percentage of AOD use and also the smallest sample size of all the groups. The literature shows that since the 1970s adolescents and ethnic minority groups have been found to have lower substance use when compared to white adolescents (Galanter, 2004; Kandel, Single, & Kessler, 1976; Substance Abuse and Mental Health Services

Administration, 2003; Welte & Barnes, 1987). The exception has been observed with Native American youth who have been shown to have the highest substance use. In addition, this observed level of usage when compared to non-Latino White students may also be due to the omission of the non-Latino Native-American or American Indian racial/ethnic group in other studies within the literature (Allen et al., 2016) for various reasons including the difficulties in collecting data on or near reservations (National Institute on Drug Abuse, 2014).

Statistically, the differences between the AOD-using and non-AOD-using groups of adolescents were found to be significant with regard to race/ethnicity. AOD-using non-Latino White students experienced greater household income and lower involvement with the criminal justice system when compared to AOD-using non-Latino Black or African American students. By contrast, AOD-using non-Latino Asian students experienced greater educational attainment, occupational status, and household income when compared to AOD-using non-Latino White students. Contrary to these findings, race/ethnicity was not found to be a significant risk or protective factor in the models predicting educational attainment, occupational status, household income, or involvement in the criminal justice system. As seen in the literature, this may be due to the fact that the present study controlled for confounders such as parental income, mother's education, and father's education, as well as other variables which have been shown to mediate the association between race/ethnicity and adult outcomes (Davis-Kean, 2005; Durrance, 2015).

With regard to Wave IV findings, non-Latino Asian and non-Latino White students attained the most successful outcomes as adults in the areas of educational

attainment, occupational status, household income, and involvement with the criminal justice system when compared to other racial groups, regardless of AOD use or abstention. By contrast, non-Latino Native American or American Indian and non-Latino Black or African American students fared the worst of all other racial groups in regard to these areas. These findings highlight the fact that these two groups have been exploited, as well as historically and systematically oppressed throughout the history of the United States (Gilio-Whitaker, 2015). Interestingly, findings also show that these two groups represented both ends of the spectrum with regard to AOD use. Non-Latino Native American or American Indian students had the highest usage of AODs within their collective group, while Black or African American students had the lowest use of all racial/ethnic groups. Despite these differences, their outcomes are similar (Green et al., 2010; National Institute on Drug Abuse, 2014).

When examining these findings within the LCT framework of cumulative advantage/disadvantage, clear social and systemic influences are evident (Dannefer, 1987, 2003; Merton, 1968; O’Rand, 1996; Wilson et al., 2007). Due to the long-lasting devastation suffered by generations within these two groups, members may experience more lost opportunities, less wealth, and fewer positions of power within society when compared to other races/ethnicities (Dannefer, 2003). The cumulative disadvantage that many non-Latino Native American or American Indian and Black or African Americans have experienced (Gilio-Whitaker, 2015), may in turn breed more disadvantage (Merton, 1968) despite their use or non-use of AODs. With the exception of higher levels of educational attainment for Black or African American students, membership in one of these two racial/ethnic groups was found to be an important factor in experiencing higher

involvement with the criminal justice system and lower overall rank in other areas of adult outcomes.

In regard to gender and AOD usage, there was a higher percentage of adolescent males (68.1%) who used AODs as opposed to adolescent females (64.8%). The groups were however, close in percentage, which supports the past literature which shows higher male AOD use but a trend in increasing female use (Patrick & O'Malley, 2015). The literature also shows higher AOD usage by White adolescent males when compared to White adolescent females (Patrick & O'Malley, 2015; Stone et al., 2012). The present study found similar results with regard to AOD use among White males (71%) and White females (70%). In addition, gender was found to be statistically significant with regard to the difference in proportions of the AOD-using and non-AOD using groups of adolescents. In regard to statistically significant differences in all races/ethnicities, AOD-using females ranked higher in educational attainment and occupational status while AOD-using males ranked higher in household income. The findings from this study reinforce the research that demonstrates while women earn a greater number of college and graduate degrees when compared to men, their salaries have been substantially less than their male counterparts (Institute for Women's Policy Research, 2010).

The findings of the present study support the literature which has shown more positive adult outcomes in the areas of educational attainment and occupational status for female adolescents who used AODs than for males (Schuster et al., 2001; Staff et al., 2008). While male gender has been found to be a risk factor with regard to adult educational and occupational attainment, in the present study, female gender was found

to be a significant protective factor with regard to predicting educational attainment and also involvement with the criminal justice system.

Age of Initiation

In Wave I the highest percentages of AOD-using adolescents reported initiation to alcohol, marijuana, cocaine, inhalants, and other illegal drugs between the ages of fourteen and sixteen. As discussed previously in Chapter IV, all age of initiation variables utilized in the study were for descriptive purposes only. This was due to the high numbers of students who were not able to be included in the regressions due to missing data for other predictor variables within in the study. In lieu of age of initiation variables, student's age and grade level provided at Wave I were included in the analyses in order to offer a sense of insight into their level of development at the time of AOD use. AOD use was at its greatest in the 11th and 12th grades and also at ages 17, 18, and 19 years. In agreement with the literature, higher age and grade level were found to be statistically significant and associated with higher adult educational attainment (K. King et al., 2006; Odgers et al., 2008) as well as occupational status.

Child Maltreatment

Findings from the present study are in accord with the literature which has shown higher AOD use in adolescents exposed to child maltreatment (Bergen et al., 2004; Shin et al., 2009). In regard to physical abuse, results from the present study have provided some evidence supporting this assertion. There was a greater percentage of students who reported physical abuse within the AOD-using group compared to the non-AOD-using group as well as a statistically significant difference between the two groups in regard to their proportions. In contrast, the difference in proportion between the AOD-using and

non-AOD-using groups with regard to sexual abuse was not statistically significant.

Research in the fields of both public health and psychology support the relationship between child maltreatment and damaging effects on adult life outcomes (Watts & McNulty, 2013). Findings in the present study however, did not show physical or sexual abuse to be a significant risk factor for predicting Wave IV outcomes. Findings support the fact that there are mixed conclusions in the literature surrounding this topic (Kerr et al., 2009). In addition, past studies have found significant relationships between child maltreatment and adverse health consequences (Huang et al., 2011; Molnar et al., 2001), while others studies have not (Kerr et al., 2009).

Internalizing & Externalizing Behaviors

With regard to externalizing behaviors, the AOD-using group of adolescents reported having more suspensions and expulsions from school when compared to the non-AOD-using group of adolescents. In addition, those adolescents who used AODs also had higher percentages of fighting at school and problems getting along with teachers. These results may be reflective of the intertwined relationship between externalizing disorders and substance use (S. King et al., 2004; Schlauch et al., 2013). As the literature shows, children with conduct disorder and oppositional defiant disorder are especially at risk for alcohol, nicotine, and marijuana use collectively. Results from the present study reiterate past findings in that male gender and suspensions and expulsions from school, as well as fighting were all found to be significantly associated with lower educational attainment in adolescents who used AODs (Veldman et al., 2015). Similar results were found for male gender, suspensions from school, and fighting, which were

also significantly associated with higher likelihood for involvement with the criminal justice system for adolescents who used AODs (Sourander et al., 2007).

As with past research, the present study did not find significant relationships between internalizing variables and adult outcomes within the AOD-using group (Bardone et al., 1998; Rao et al., 2000). However, feeling the blues was found to be significant in predicting lower household income for non-AOD users. In addition, the AOD-using and non-AOD-using adolescents were also found to be significantly different in the last time they felt depressed or frequency in feeling the blues, with the AOD-using group having higher percentages than their non-using counterparts.

Religiosity

Results from the present study supported the assertions that religiosity is a protective factor for adolescents (Barton et al., 2014; Hayatbakhsh et al., 2014; Wongtongkam et al., 2014). Youth who reported attending religious services once a week or more, felt that religion was very important, and prayed at least once a day reported a higher percentage of abstaining from AODs. These results are in accordance with findings from the literature (Mason et al., 2012; Salas-Wright et al., 2012). In addition, higher importance of religion, and higher frequency of praying, were found to be statistically significant and associated with higher educational attainment. There was also a statistically significant difference between the AOD-using group and the non-AOD-using group in regard to higher frequency in religious service attendance, higher importance of religion, and higher frequency of praying. These findings further reiterate

the protective nature of religiosity as seen in the literature (Jang, Bader, & Johnson, 2008; Kim-Spoon et al., 2014).

Interpersonal Risk and Protective Factors & Adult Outcomes

Family Dynamics

Family dynamics have been found to be very important in regard to adolescent development as well as risk and protective influences (Epstein, 2009; Schlauch et al., 2013). The results from this study corroborate these findings and show the areas where there is the most impact. The AOD-using group and the non-AOD-using group were found to be significantly different from one another in regard to the level of fun and cohesiveness they saw in their families. The non-AOD-using group reported higher percentages in levels of fun and cohesiveness. The AOD-using group of adolescents also had greater percentages with regard to their accessibility to drugs and alcohol in the home when compared to the non-AOD-using adolescents. Again, the two groups were found to be significantly different from one another.

The influence of family dynamics during adolescence have been found to act as a significant predictor for future outcomes throughout the life course (Viner et al., 2012). Surprisingly, there were no Wave I family dynamic variables that were statistically significant in predicting adult educational attainment, occupational status, household income, or involvement in the criminal justice system for the AOD-using adolescent group. Past literature has shown that a secure relationship with parents in conjunction with doing family activities was found to be protective (Wang et al., 2005). In addition, living in a home where alcohol was easily accessible was found to be a significant risk

factor (Bremner et al., 2011; Marshall, 2014). The influence of family dynamics may perhaps be important for this sample of adolescents but the timing of the influence may also be of note (Cleveland et al., 2008). All of the adolescents in the study's sample were in high school and may have exhibited more independence with a greater influence with regard to peers as opposed to family (Bremner et al., 2011; Marshall, 2014). Past research has shown a shift based on age whereas the influence of the family becomes a lesser factor for older adolescents who are then more influenced by peers (Cleveland et al., 2008). By contrast, when observing the non-AOD users, a significant relationship was shown for one family dynamic variable. Being allowed to choose their own friends to hang out with was found to be significantly associated with higher educational attainment in Wave IV for those adolescents who did not use AODs in Wave I.

Peer Influence

The results from the present study are in accord with the literature which has shown that adolescents engage in more high-risk behaviors if they are associated with peers that are also involved in these behaviors (Gardner & Steinberg, 2005; Marshall, 2014). Researchers have also found that adolescents who had friends that used drugs were more likely to use drugs themselves, especially marijuana (Wongtongkam et al., 2014) and also find peers who were similarly deviant, thus reinforcing the behavior (Dishion & Owen, 2002; Hicks et al., 2014; Piehler et al., 2012). The AOD-using group of adolescents had higher percentages for the number of their three best friends who used alcohol at least once a month and also the number of their three best friends who used marijuana at least once a month when compared to the students who did not use AODs.

The AOD-using group of adolescents and the non-AOD-using group were also found to be significantly different from one another in regard to the number of their three best friends who used alcohol at least once a month. In addition, the two groups were also found to be significantly different from one another in regard to the number of their three best friends who used marijuana at least once a month.

In regard to adult outcomes, higher number of their three best friends who used alcohol at least once a month was found to be statistically significant in predicting higher involvement with the criminal justice system. These findings reiterate what the literature states. In addition to substance use, deviant peer association has been attributed to adult anti-social behavior as well as criminality (Huesmann et al., 2002). Interestingly, number of their three best friends who used marijuana at least once a month was not found to be significantly associated with any of the adult outcome variables in Wave IV. This was a surprising finding; however, peer marijuana usage and its influence on adolescents has traditionally been more ambiguous and more difficult to pinpoint than other substances (Tucker et al., 2014).

Environmental Risk and Protective Factors & Adult Outcomes

School & Neighborhood Environment

Past research has shown higher school connectedness (Resnick et al., 1997) and school commitment (Wongtongkam et al., 2014) to be protective against substance use for adolescents. While the present study does not measure these variables per se, attitudes surrounding happiness at school and neighborhood were examined along with attitudes surrounding safety within these two areas of environment. The findings from

this study support the premise set forth in the literature that the adolescent's perceptions regarding their neighborhood (Martin-Storey & Crosnoe, 2014), and school environment (Milam, Furr-Holden, & Leaf, 2010) can be protective. Results from this study are in accordance with the literature and show a greater percentage of non-AOD-using students who reported stronger feelings of happiness in regard to their school (Resnick et al., 1997) and neighborhood (National Institute on Drug Abuse, 2003) compared to their AOD-using counterparts. In addition, a greater percentage of non-AOD-using students also reported feeling safe at school when compared to AOD-using students.

The AOD-using group and non-AOD-using group of adolescents in this study were found to be significantly different from each other with regard to happiness with school, happiness with neighborhood, and feeling safe in school. Regarding their feelings of safety within their neighborhood, the two groups had closer percentages and were not found to be significantly different from one another. For AOD-users, lower happiness/satisfaction in neighborhood was found to be significant in predicting higher educational attainment, while feeling safe at school was found to be statistically significant and protective against lower occupational status.

Conclusion

The present study examined the effects of adolescent AOD use on adult outcomes including educational attainment, occupational status, household income, and involvement in the criminal justice system. The life trajectories of substance-using adolescents who experienced high levels of achievement in adulthood despite numerous disadvantages on the individual, interpersonal, and environmental levels were explored. Using quantitative statistical methods, risk and protective factors were identified by

examining Wave I variables including gender, race/ethnicity, child maltreatment, internalizing and externalizing behaviors, religiosity, family dynamics, peer influence, as well as school environment and neighborhood environment.

While students who did not use AODs in Wave I generally had the most favorable outcomes in Wave IV, adolescents within the cohort who used AODs had a variety of outcomes that ranged from flourishing to failing. These outcomes were influenced by the risk and protective factors that separated them from one another. Gender was shown to be protective in that females who used AODs in adolescence showed the most favorable outcomes in educational attainment, occupational status, and involvement in the criminal justice system, when compared to males. Non-Latino Black or African American racial/ethnic identity was protective for lower AOD use. Religiosity, higher age, higher grade level at the time of the survey, not fighting or having suspensions or expulsions, and feeling safe at school were shown to be protective for students who used AODs in adolescence against lower educational attainment, lower occupational status, and higher involvement with the criminal justice system.

Risk factors for AOD-using adolescents included male gender, which was indicative of lower educational attainment, occupational status, and higher involvement in the criminal justice system. Lower grade level at the time of the survey, more best friends who frequently drank alcohol, externalizing behaviors resulting in suspensions and expulsions from school, as well as fighting were also indicative of lower educational attainment and higher involvement in the criminal justice system.

The findings from the present study are made relevant to the field of public health due to the use of longitudinal data to better understand the dynamics related to adolescent

substance use and their effects on the life course. The literature supports the aspect of cumulative advantage/disadvantage within LCT and demonstrates that adult health outcomes are unequivocally linked to earlier events in childhood and adolescence (B. Evans et al., 2009; Richter, 2006). In *Children of the Great Depression*, Elder analyzed archives from the 1920s and through his innovative approach to the life course, told the story of adolescent boys growing up during the Great Depression (Richter, 2006). Elder thus set the tone for the social sciences with what has become one of the most influential longitudinal studies to be conducted in the literature. Following Elder, there have been a few significant longitudinal studies that have been conducted which include the 1946 British National Birth Cohort Follow-Up Study, the 1956 New York Longitudinal Study, and the National Longitudinal Study of Adolescent to Adult Health from which the present study is derived. Each one of these studies has highlighted the guidance of LCT in understanding human development.

In identifying risk and protective factors influencing the life course of substance-using adolescents, an understanding of the effects of AODs was gained. Due to the differences in individual characteristics, households, and environment of each adolescent respondent in the cohort, some thrived while others did not. Cumulative advantage/disadvantage plays a vital role in fully understanding these differences and how they interplay throughout the life course (Dannefer, 2003). For those who were able to realize a level of accomplishment despite using AODs, much can be learned. In this sense, resilience can be fostered through public health interventions for the adolescents that have had numerous disadvantages and success can be attained (Ahern, 2006; Rouse & Ingersoll, 1998).

Implications

The World Health Organization has encouraged a focus on multiple health determinants within a multi-faceted approach to viewing health risk behaviors (World Health Organization, 2014). While it has been established by the literature that multiple risk factors can be detrimental to an individual, it is also possible for an individual to benefit from multiple protective factors (Hutchinson, 2011). In this sense, it is important to examine both cumulative disadvantage as well as advantage when attempting to fully comprehend disparities related to health (Hatch, 2005). The risk and protective factors identified from the present study, as well as other life-course studies (Schulz & Heckhausen, 1996) are vital to the development of future preventive interventions (Griffin & Botvin, 2010). Findings serve to assist public health professionals in recognizing specific factors such as membership in the non-Latino Native American and non-Latino Black or African American groups, externalizing behaviors, and younger age and grade as risk factors that should be addressed. Promoting the health of adolescents who have already used AODs, while also developing interventions designed to prevent adolescent substance use, must both be key goals for the field of public health. Although there are varying types of programs established in different settings (Griffin & Botvin, 2010), effective interventions should take into account the unique abilities of adolescents as well as their physical and social environments (World Health Organization, 2014). In this sense, school-based intervention programs are appropriate and have also been found to be especially effective at reducing and preventing substance use in youth (Griffin & Botvin, 2010). In addition, researchers recommend school-based interventions for adolescents due to their ability to reach greater numbers of youth and be accessible to

students who are already attending school (Carney et al., 2014; Hodder et al., 2014). Furthermore, fewer resources are required to establish and maintain these programs due to the ability of school staff to implement them (Griffin & Botvin, 2010). School-based interventions are also especially effective in that teachers and other school personnel may be more likely to develop a rapport and build trust with students over the course of time that the student attends the school which may aid in the effectiveness of the intervention. Lastly, teachers may also be able to identify problematic risk factors in the students they see frequently, thus improving the identification of high-risk adolescents.

In understanding risk and protective factors influencing substance-using adolescents, more strides can be made to promote their health through intervention (Brown et al., 2009). Life Course Theory may serve as a guide in the development of interventions to change the life trajectory of adolescents (Maternal and Child Health Bureau, 2010). By reducing the impact of risk factors and strengthening the mitigating effects of protective factors, resilience can be fostered (Ahern, 2006; Rouse & Ingersoll, 1998). These new interventions would actively promote the well-being of youth and work to offset the effects of risk factors identified at critical stages of their development (Richter, 2006). Finally, by educating youth on the dangerous effects of AODs early in the life course (National Institute on Drug Abuse, 2008) and establishing positive health behaviors, society can influence a future generation of healthy and productive adults (Healthy People 2020, 2014).

Replicability of Findings

Per current NIH guidelines on replicability in the social and behavioral sciences, findings from the present study are able to replicated (Nosek, 2014).

Limitations

Limitations of the present study mainly stem from the fact that alcohol and drugs are combined when examining the AOD-using group. Due to this limitation, analysis of specific adolescent groups based on AOD type, or AOD use frequency, were not viable. This was due to the substantial variation in group sizes and analysis complications that arose as a result. It was for this reason that the decision was made to combine all AOD groups into one. In addition, the frequency or severity of AOD use was also not able to be distinguished between adolescent AOD-using group members. This limitation affects the ability to examine the level of alcohol or drug use with regard to the adult outcomes.

Another limitation of the study was the omission of military occupations within the analyses of occupational status due to the exclusion of these positions from the SOC Crosswalk created by the Occupational Information Network (O*NET) classification and database version 20.3 (National Center for O*NET Development, 2016). Military occupations differ from civilian occupations in the information that is available to the Occupational Information Network (O*NET) for classification purposes. As with other studies which used similar methods, (Kirchoff et al., 2011; Queiros et al., 2015) this information was not able to be included and detracts from the variation with regard to occupations included in the study.

Statistically, there were limitations as well. Due to the analysis strategy selected for the Add Health data, all model fit statistics were not able to be produced. More specifically, R was not reported. While Pseudo R was obtained, it was not reported due to the fact that many models were not analyzed and therefore multiple Pseudo Rs were not obtained through comparison. In addition, analyses for all combinations of race/ethnic groups were not able to be included post hoc due to the astronomical nature of the possible pair combinations ($6! = 720$) with the Mann-Whitney tests (Wilcoxon Rank-Sum) as well as the increasing possibility of a Type 1 error with the more tests run (Field, 2005). Due to missing data and errors in analysis, the age of initiation variables were also not able to be included in the regression models. Finally, post hoc power analyses in the study were not able to be conducted for ordinal and binomial logistic regression models due to analysis strategy, missing data, and a lack of statistical software that would accurately conduct the analysis (Davey & Savla, 2010). This issue may be resolved at a later date with the application of newer technologies.

Self-report bias was also a limitation of the study due to the sensitive nature of the topic of alcohol use which is illegal for youth and drug use which is illegal for both adolescents and adults. Even though methods for the Add Health study are sound, there may be limitations because of a lack of student openness. This may be one reason for the missing data surrounding AOD use and other topics deemed sensitive. However, despite the aforementioned limitations, the present study contributes to the body of literature and provides valuable information regarding risk and protective factors surrounding adolescent AOD use and later adult outcomes.

REFERENCES

- Abdelrahman, A. I., Rodriguez, G., Ryan, J. A., French, J. F., & Weinbaum, D. (1998). The epidemiology of substance use among middle school students: The impact of school, familial, community, and individual risk factors. *Journal of Child & Adolescent Substance Abuse, 8*, 55–75.
- Aebi, M., Giger, J., Plattner, B., Metzke, C., & Steinhausen, H. C. (2014). Problem coping skills, psychosocial adversities and mental health problems in children and adolescents as predictors of criminal outcomes in young adulthood. *European Child and Adolescent Psychiatry, 23*, 283–293.
- Ahern, N. (2006). Adolescent resilience: An evolutionary concept analysis. *Journal of Pediatric Nursing, 21*, 175–185.
- Alati, R., Baker, P., Betts, K. S., Connor, J. P., Little, K., Sanson, A., & Olsson, C. (2014). The role of parental alcohol use, parental discipline and antisocial behaviour on adolescent drinking trajectories. *Drug and Alcohol Dependence, 134*, 178–184.
- Allen, C., McNeely, C., & Orme, J. (2016). Self-Rated Health Across Race, Ethnicity, and Immigration Status for US Adolescents and Young Adults. *Journal of Adolescent Health, 58*, 47–56.
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Washington, DC.
- American Psychological Association. (2002). *Developing Adolescents: A Reference for Professionals*. Washington, D.C.
- Arnett, J. (2006). G. Stanley Hall's Adolescence: Brilliance and nonsense. *History of Psychology, 9*, 186–197.
- Arthur, M., Hawkins, J., Pollard, J., Catalano, R., & Baglioni Jr., A. J. (2002). Measuring risk and protective factors for substance use, delinquency, and other adolescent problem behaviors: The Communities That Care Youth Survey. *Evaluation Review, 26*, 575–601.
- Bardone, A., Moffitt, T., Caspi, A., Dickson, N., Stanton, W., & Silva, P. (1998). Adult physical health outcomes of adolescent girls with conduct disorder, depression, and anxiety. *Journal of the American Academy of Child and Adolescent Psychiatry, 37*, 594–601.
- Bartkowski, J. P., & Xu, X. (2007). Religiosity and teen drug use reconsidered. A social capital perspective. *American Journal of Preventive Medicine, 32*, 182–194.

- Barton, A., Snider, J., Vazsonyi, A., & Cox, J. (2014). Adolescent religiosity as a mediator of the relationship between parental religiosity and adolescent health outcomes. *Journal of Religion and Health, 53*, 86–94.
- Bentler, P. M. (1992). Etiologies and consequences of adolescent drug use: Implications for prevention. *Journal of Addictive Diseases, 11*, 47–61.
- Bergen, H. A., Martin, G., Richardson, A. S., Allison, S., & Roeger, L. (2004). Sexual abuse, antisocial behaviour and substance use: Gender differences in young community adolescents. *Australian and New Zealand Journal of Psychiatry, 38*, 34–41.
- Bernat, D., Oakes, M., Pettingell, S., & Resnick, M. (2012). Risk and direct protective factors for youth violence: Results from the National Longitudinal Study of Adolescent Health. *American Journal of Preventive Medicine, 43*, 57–66.
- Berzin, S. (2010). Vulnerability in the transition to adulthood: Defining risk based on youth profiles. *Children and Youth Services Review, 32*, 487–495.
- Beyers, J., Toumbourou, J., Catalano, R., Arthur, M., & Hawkins, J. (2004). A cross-national comparison of risk and protective factors for adolescent substance use: The United States and Australia. *The Journal of Adolescent Health, 35*, 3–16.
- Binstock, R. H., & George, L. K. (Eds.). (2011). *Handbook of aging and the social sciences*.
- Bond, L., Thomas, L., Toumbourou, J., Patton, G., & Catalano, R. (2000). *Improving the lives of young Victorians in our community: A survey of risk and protective factors*. Melbourne: Centre for Adolescent Health.
- Bond, L., Toumbourou, J. W., Thomas, L., Catalano, R. F., & Patton, G. (2005). Individual, family, school, and community risk and protective factors for depressive symptoms in adolescents: A Comparison of risk profiles for substance use and depressive symptoms. *Prevention Science, 6*, 73–88.
- Brand, E. F., King, C. A., Olson, E., Ghaziuddin, N., & Naylor, M. (1996). Depressed adolescents with a history of sexual abuse: Diagnostic comorbidity and suicidality. *Journal of the American Academy of Child and Adolescent Psychiatry, 35*, 34–41.
- Bremner, P., Burnett, J., Nunney, F., Ravat, M., & Mistral, W. (2011). *Young people, alcohol and influences: A study of young people and their relationship with alcohol*. York: Joseph Rowntree Foundation.
- Breshears, E. M., Yeh, S., & Young, N. K. (2004). *Understanding substance abuse and facilitating recovery: A Guide for child welfare workers*. National Center on Substance Abuse and Child Welfare. Rockville, MD:U.S. Department of Health and Human Services-Substance Abuse and Mental Health Services Administration.

- Brody, G. H., & Ge, X. (2001). Linking parenting processes and self-regulation to psychological functioning and alcohol use during early adolescence. *Journal of Family Psychology, 15*, 82–94.
- Broman, C. (2009). The Longitudinal impact of adolescent drug use on socioeconomic outcomes in young adulthood. *Journal of Child & Adolescent Substance Abuse, 18*, 131–143.
- Broman, C., Reckase, M. D., & Freedman-Doan, C. R. (2006). The role of parenting in drug use among black, Latino and white adolescents. *Journal of Ethnicity in Substance Abuse, 5*, 39–50.
- Brown, S. A., McGue, M., Maggs, J., Schulenberg, J., Hingson, R., Swartzwelder, S., ... Murphy, S. (2009). Underage alcohol use. *Alcohol Research and Health, 32*, 41–52.
- Bryden, A., Roberts, B., Petticrew, M., & Mckee, M. (2013). A systematic review of the influence of community level social factors on alcohol use. *Health & Place, 21*, 70–85.
- Buchmann, A., Schmid, B., Blomeyer, D., Becker, K., Treutlein, J., Zimmermann, U., ... Laucht, M. (2009). Impact of age at first drink on vulnerability to alcohol-related problems: Testing the marker hypothesis in a prospective study of young adults. *Journal of Psychiatric Research, 43*, 1205–1212.
- Bureau of Labor Statistics. (2010). 2010 Standard Occupational Classification (SOC) System. Retrieved from http://www.bls.gov/soc/major_groups.htm
- Carney, T., Myers, B., Louw, J., & Okwundu, C. (2014). *Brief school-based interventions and behavioural outcomes for substance-using adolescents (Review)*. Hoboken: The Cochrane Collaboration.
- Carolina Population Center, & Udry, J. R. (1998). *National Longitudinal Study of Adolescent Health (Add Health), A user's guide to the machine-readable files and documentation* (Vol. 2812). Chapel Hill: Carolina Population Center.
- Case, S. (2007). Indicators of adolescent alcohol use: A composite risk factor approach. *Substance Use Misuse, 42*, 89–111.
- Cecil, C., Viding, E., Barker, E. D., Guiney, J., & McCrory, E. J. (2014). Double disadvantage: The influence of childhood maltreatment and community violence exposure on adolescent mental health. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 55*, 839–848.
- Centers for Disease Control and Prevention. (2002). *Adolescent and school health: Injury*. Retrieved from <http://www.cdc.gov/nccdphp/dash/injury.htm>.

- Centers for Disease Control and Prevention. (2012). Youth Risk Behavior Surveillance-2011 United States. *Morbidity Mortality Weekly Report*, *61*, 1–168.
- Centers for Disease Control and Prevention. (2014). Youth Risk Behavior Surveillance-2013 United States. *Morbidity Mortality Weekly Report*, *63*, 1–168.
- Chen, P., & Chantala, K. (2014). *Guidelines for analyzing Add Health data*. Chapel Hill: Carolina Population Center.
- Chen, P., & Jacobson, K. (2012). Developmental trajectories of substance use from early adolescence to young adulthood: Gender and racial/ethnic differences. *The Journal of Adolescent Health*, *50*, 154–163.
- Cleveland, M., Feinberg, M., Bontempo, D., & Greenberg, M. (2008). The role of risk and protective factors in substance use across adolescence. *The Journal of Adolescent Health*, *43*, 157–164.
- Colman, I., Murray, J., Abbott, R. A., Maughan, B., Kuh, D., Croudace, T. J., & Jones, P. B. (2009). Outcomes of conduct problems in adolescence: 40 year follow-up of national cohort. *British Medical Journal*, *338*, 2981.
- Cooper, M., Wood, P., Orcutt, H., & Albino, A. (2003). Personality and the predisposition to engage in risky or problem behaviors during adolescence. *Journal of Personality and Social Psychology*, *84*, 390–410.
- Danielsson, A., Wennberg, P., Hibell, B., & Romelsjö, A. (2012). Alcohol use, heavy episodic drinking and subsequent problems among adolescents in 23 European countries: Does the prevention paradox apply? *Addiction*, *107*, 71–80.
- Dannefer, D. (1987). Aging as intracohort differentiation: Accentuation, the Matthew Effect, and the life course. *Sociological Forum*, *2*, 211–236.
- Dannefer, D. (2003). Cumulative advantage/disadvantage and the life course: Cross-fertilizing age. *ProQuest Nursing & Allied Health*, *58*(6).
- Davey, A., & Savla, J. (2010). *Statistical power analysis with missing data: A structural equation modeling approach*. New York, NY: Routledge/Taylor & Francis Group.
- Davis-Kean, P. (2005). The influence of parent education and family income on child achievement: The indirect role of parental expectations and the home environment. *Journal of Family Psychology*, *19*, 294–304.
- Dekovic, M., Slagt, M. I., Asscher, J. J., Boendermaker, L., Eichelsheim, V. I., & Prinzie, P. (2011). Effects of early prevention programs on adult criminal offending: A meta-analysis. *Clinical Psychology Review*, *31*, 532–544.

- Deschenes, S., Little, P., Grossman, J., & Arbreton, A. (2010). Participation over time: Keeping youth engaged from middle school to high school. *Afterschool Matters*, 12, 1–8.
- Dishion, T. J., & Owen, L. D. (2002). A longitudinal analysis of friendships and substance use: Bidirectional influence from adolescence to adulthood. *Developmental Psychology*, 38, 480–491.
- Dohn, M. N., Mendez, S. A., Pozo, M. N., Cabrera, E. A., & Dohn, A. (2014). Alcohol use and church attendance among seventh through twelfth grade students, Dominican Republic, 2011. *Journal of Religion and Health*, 53, 675–689.
- Dong, M., Anda, R., Felitti, V., Dube, S., Williamson, D., Thompson, T., ... Giles, W. (2004). The interrelatedness of multiple forms of childhood abuse, neglect, and household dysfunction. *Child Abuse & Neglect*, 28, 771–784.
- Duncan, S., Duncan, T. E., Biglan, A., & Ary, D. (1998). Contributions of the social context to the development of adolescent substance use: A multivariate latent growth modeling approach. *Drug and Alcohol Dependence*, 50, 57–71.
- Durrance, S. (2015). Do family income and parent education explain racial differences in student expectations? Retrieved from www.slideshare.net/SamanthaDurrance/samantha-durrance-do-family-income-and-parent-education-explain-racial-differences-in-student-expectations
- Elder, G. H. (1974). *Children of the Great Depression: Social change in life experience* (2nd ed.). Boulder: Westview Press.
- Elder, G. H. (1994). Time, human agency, and social change: Perspectives on the life course. *Social Psychology Quarterly*, 57, 4–15.
- Elder, G. H. (1998). The life course and human development. In R. M. Lerner & W. Damon (Eds.), *Handbook of child psychology, Volume 1: Theoretical models of human development* (5th ed.). New York: Wiley.
- Elder, G. H. (1999). *The life course and aging: Some reflections*. Chapel Hill: University of North Carolina at Chapel Hill.
- Elder, G. H., Johnson, M. K., & Creosnoe, R. (2003). The emergence and development of Life Course Theory. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the life course* (pp. 3–5). New York: Kluwer Academic/Plenum.
- Ellickson, P. L., Martino, S. C., & Collins, R. L. (2004). Marijuana use from adolescence to young adulthood: Multiple developmental trajectories and their associated outcomes. *Health Psychology*, 23, 299–307.

- Enoch, M. A. (2006). Genetic and environmental influences on the development of alcoholism. Resilience vs. risk. *Annals of the New York Academy of Sciences*, *1094*, 193–201.
- Enoch, M. A. (2011). The role of early life stress as a predictor for alcohol and drug dependence. *Psychopharmacology*, *214*, 17–31.
- Epstein, M. H. (2009). *Behavioral and emotional rating scale* (2nd ed.). Austin, TX: PRO-ED.
- Evans, B., Crogan, N., Belyea, M., & Coon, D. (2009). Utility of the life course perspective in research with Mexican American caregivers of older adults. *Journal of Transcultural Nursing*, *20*, 5–14.
- Evans, S. Z., Simons, L. G., & Simons, R. L. (2016). Factors that influence trajectories of delinquency throughout adolescence. *Journal of Youth and Adolescence*, *45*, 156–171.
- Evans-Polce, R., Vasilenko, S., & Lanza, S. (2015). Changes in gender and racial/ethnic disparities in rates of cigarette use, regular heavy episodic drinking, and marijuana use: Ages 14 to 32. *Addictive Behaviors*, *41*, 218–222.
- Fergusson, D. M., Boden, J. M., & Horwood, L. J. (2008). The developmental antecedents of illicit drug use: Evidence from a 25-year longitudinal study. *Drug and Alcohol Dependence*, *96*, 165–177.
- Fergusson, D. M., Woodward, L. J., & Horwood, L. J. (1999). Childhood peer relationship problems and young people's involvement with deviant peers in adolescence. *Journal of Abnormal Child Psychology*, *27*, 357–369.
- Ferraro, K. F., & Shippee, T. P. (2009). Aging and cumulative inequality: How does inequality get under the skin? *Gerontologist*, *49*, 333–343.
- Field, A. (2005). *Discovering Statistics Using SPSS* (2nd ed.). London: Sage.
- Ford, C. A., Pence, B. W., Miller, W. C., Resnick, M. D., Bearinger, L., Pettingell, S., & Cohen, M. (2005). Predicting adolescents' longitudinal risk for sexually transmitted infection. *Archives of Pediatric Adolescent Medicine*, *159*, 657–664.
- Friedman, A. S., Terras, A., & Zhu, W. (2004). Early adolescent substance use/abuse as predictor to employment in adulthood: Gender differences. *Journal of Child & Adolescent Substance Abuse*, *13*, 49–60.
- Galanter, M. (Ed.). (2004). *Recent developments in alcoholism: Volume 17 alcohol problems in adolescents and young adults*. London: Kluwer Academic/Plenum.

- Garavan, H., & Stout, J. C. (2005). Neurocognitive insights into substance abuse. *Trends in Cognitive Neuroscience, 9*, 195–201.
- Garcia, T. A. (2012). *Evaluating heavy episodic drinking effects on educational attainment. Paper 583*. Florida International University.
- Gardner, M., & Steinberg, L. (2005). Peer influence on risk taking, risk preference, and risky decision making in adolescence and adulthood: An experimental study. *Developmental Psychology, 41*, 625–635.
- Garmezy, N. (1991). Resilience in children's adaptation to negative life events and stressed environments. *Pediatric Annals, 20*, 459–466.
- Gilio-Whitaker, D. (2015). Genocide and slavery: The evil twins of Colonialism. Retrieved from <http://indiancountrytodaymedianetwork.com/2015/02/23/genocide-and-slavery-evil-twins-colonialism>
- Gill, A. M., & Michaels, R. J. (1992). Does drug use lower wages? *Industrial & Labor Relations Review, 45*, 419–434.
- Gilmore, K., & Meersand, P. (2014). *Little book of child and adolescent development*. Cary, NC: Oxford University Press.
- Grant, B., & Dawson, D. (1997). Age at onset of alcohol use and its association with DSM-IV alcohol abuse and dependence: Results from the National Longitudinal Alcohol Epidemiologic Survey. National Institute on Alcohol Abuse and Alcoholism. *Journal of Substance Abuse, 9*, 103–110.
- Green, K. M., Doherty, E. E., Stuart, E. A., & Ensminger, M. E. (2010). Does heavy adolescent marijuana use lead to criminal involvement in adulthood? Evidence from a multiwave longitudinal study of urban African Americans. *Drug and Alcohol Dependence, 112*, 117–125.
- Greenbaum, P. E., Prange, M. E., Friedman, R. M., & Silver, S. E. (1991). Substance abuse prevalence and comorbidity with other psychiatric disorders among adolescents with severe emotional disturbances. *Journal of the American Academy of Child and Adolescent Psychiatry, 30*, 575–583.
- Griffin, K. W., & Botvin, G. J. (2010). Evidence-based interventions for preventing substance use disorders in adolescents. *Child and Adolescent Psychiatric Clinics of North America, 19*, 505–526. Retrieved from <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2916744&tool=pmcentrez&rendertype=abstract>
- Gruber, J. (2004). Is making divorce easier bad for children? The long-run implications of unilateral divorce. *Journal of Labor Economics, 22*, 799–833.

- Gryczynski, J., & Ward, B. W. (2012). Religiosity, heavy alcohol use, and vicarious learning networks among adolescents in the United States. *Health Education & Behavior, 39*, 341–351.
- Guerrini, I., Quadri, G., & Thomson, A. D. (2014). Genetic and environmental interplay in risky drinking in adolescents: A literature review. *Alcohol and Alcoholism (Oxford, Oxfordshire), 49*, 138–42.
- Hair, E., Park, M., Ling, T., & Moore, K. (2009). Risky behaviors in late adolescence: Co-occurrence, predictors, and consequences. *Journal of Adolescent Health, 45*, 253–261.
- Hall, G. (1904). *Adolescence: Its psychology and its relations to physiology, anthropology, sociology, sex, crime, religion, and education (Vols. I and II)*. New York: D. Appleton & Co.
- Harris, K. M., Halpern, C. T., Whitsel, E., Hussey, J., Tabor, J., Entzel, P., & Udry, J. R. (2009). The National Longitudinal Study of Adolescent to Adult Health: Research Design [WWW document]. Retrieved from <http://www.cpc.unc.edu/projects/addhealth/design>
- Harris, K. M., & Udry, J. R. (n.d.). National Longitudinal Study of Adolescent to Adult Health (Add Health), 1994-2008 [Public Use]. ICPSR21600-v17. Chapel Hill, NC: Carolina Population Center, University of North Carolina-Chapel Hill/Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributors], 2016-05-25. Retrieved from <http://doi.org/10.3886/ICPSR21600.v17>
- Hatch, S. L. (2005). Conceptualizing and identifying cumulative adversity and protective resources: Implications for understanding health inequalities. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences, 60*, 130–134.
- Hawkins, J., Catalano, R. F., & Arthur, M. W. (2002). Promoting science-based prevention in communities. *Addictive Behaviours, 27*, 951–976.
- Hawkins, J., Catalano, R., & Miller, J. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin, 112*, 64–105.
- Hawkins, J., Graham, J., Maguin, E., Abbott, R., Hill, K., & Catalano, R. (1997). Exploring the effects of age of alcohol use initiation and psychosocial risk factors on subsequent alcohol misuse. *Journal of Studies on Alcohol, 58*, 280–290.
- Hayatbakhsh, R., Clavarino, A., Williams, G. M., & Najman, J. M. (2014). Maternal and personal religious engagement as predictors of early onset and frequent substance use. *American Journal on Addictions, 23*, 363–370.

- Healthy People 2020. (2014). Adolescent health. Retrieved from <https://www.healthypeople.gov/2020/topics-objectives/topic/Adolescent-Health>
- Hemphill, S., Heerde, J., Herrenkohl, T., Patton, G., Toumbourou, J., & Catalano, R. (2011). Risk and protective factors for adolescent substance use in Washington State, the United States and Victoria, Australia: A longitudinal study. *The Journal of Adolescent Health, 49*, 312–320.
- Herrenkohl, T. I., Kosterman, R., Mason, W. A., Hawkins, J. D., McCarty, C. A., & McCauley, E. (2010). Effects of childhood conduct problems and family adversity on health, health behaviors, and service use in early adulthood: Tests of developmental pathways involving adolescent risk-taking and depression. *Development and Psychopathology, 22*, 655–665.
- Hicks, B., Johnson, W., Durbin, C., Blonigen, D., Iacono, W., & McGue, M. (2014). Delineating selection and mediation effects among childhood personality and environmental risk factors in the development of adolescent substance abuse. *Journal of Abnormal Child Psychology, 42*, 845–59.
- Hodder, R., Freund, M., Wolfenden, L., Bowman, J., Gillham, K., Dray, J., & Wiggers, J. (2014). Systematic review of universal school-based resilience interventions targeting adolescent tobacco, alcohol or illicit drug use: Review protocol. *BMJ Open, 4*, 4718. Retrieved from <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4039828&tool=pmcentrez&rendertype=abstract>
- Hodgins, S., Lövenhag, S., Rehn, M., & Nilsson, K. (2014). A 5-year follow-up study of adolescents who sought treatment for substance misuse in Sweden. *European Child & Adolescent Psychiatry, 23*, 347–60.
- Horan, J., & Widom, C. (2015). Does age of onset of risk behaviors mediate the relationship between child abuse and neglect and outcomes in middle adulthood? *Journal of Youth and Adolescence, 44*, 670–682.
- Honor, G. (2010). Child sexual abuse: Consequences and implications. *Journal of Pediatric Health Care, 24*, 358–364.
- Howard, A., & Galambos, N. (2011). Transitions to adulthood. *Encyclopedia of Adolescence, 1*, 376–383.
- Huang, S., Trapido, E., Fleming, L., Arheart, K., Crandall, L., French, M., ... Prado, G. (2011). The long-term effects of childhood maltreatment experiences on subsequent illicit drug use and drug-related problems in young adulthood. *Addictive Behaviors, 36*, 95–102.

- Huesmann, L. R., Eron, L. D., & Dubow, E. F. (2002). Childhood predictors of adult criminality: Are all risk factors reflected in childhood aggressiveness? *Criminal Behaviour and Mental Health, 12*, 185–208.
- Hussey, J. M., Chang, J. J., & Kotch, J. B. (2006). Child maltreatment in the United States: Prevalence, risk factors, and adolescent health consequences. *Pediatrics, 118*, 933–942.
- Hutchinson, E. (2011). *Dimensions of human behavior: The changing life course* (4th ed.). Thousand Oaks: Sage.
- Hutchinson, E., Matto, H., Harrigan, M., Charlesworth, L., & Viggiani, P. (2007). *Challenges of living: A multidimensional working model for social workers*. London: Sage.
- Institute for Women's Policy Research. (2010). Pay equity & discrimination. Retrieved from www.iwpr.org/initiatives/pay-equity-and-discrimination
- Institute of Medicine (IOM) Committee on Prevention of Mental Disorders. (1994). *Reducing risks for mental health disorders: Frontiers for preventive intervention research*. Washington, DC: National Academy Press. Retrieved from <http://www.nap.edu/read/2139/chapter/1#xix>
- Jaffee, S., Caspi, A., Moffitt, T., Polo-Tomas, M., & Taylor, A. (2007). Individual, family, and neighborhood factors distinguish resilient from non-resilient maltreated children: A cumulative stressors model. *Child Abuse and Neglect, 31*, 231–253.
- Jang, S., Bader, C., & Johnson, B. (2008). The cumulative advantage of religiosity in preventing drug use. *The Journal of Drug Issues, Summer*, 771–798.
- Jessor, R., Turbin, M., & Costa, F. (1998). Risk and protection in successful outcomes among disadvantaged adolescents. *Applied Developmental Science, 2*, 194–208.
- Johnston, L. D., O'Malley, P., Bachman, J., & Schulenberg, J. (2010). *Monitoring the Future national results on adolescent drug use: Overview of key findings 2009*. Bethesda, MD: National Institute on Drug Abuse.
- Johnston, L. D., O'Malley, P. M., Miech, R. A., Bachman, J. G., & Schulenberg, J. E. (2016). *Monitoring the Future national survey results on drug use, 1975-2015: Overview, key findings on adolescent drug use*. Ann Arbor: Institute for Social Research.
- Kandel, D., Davies, M., Karus, D., & Yamaguchi, K. (1986). The consequences in young adulthood of adolescent drug involvement. An overview. *Archives of General Psychiatry, 43*, 746–754.

- Kandel, D., Single, E., & Kessler, R. (1976). The epidemiology of drug use among New York state high school students: Distribution, trends, and changes in rates of use. *American Journal of Public Health, 66*, 43–53.
- Kelley, M. S., & Peterson, J. . (1997). *The National Longitudinal Study of Adolescent Health (Add Health), Waves I & II, 1994-1996: A user's guide to the machine-readable files and documentation (Data Sets 48-50, 98, A1A3)*. Los Altos, CA.
- Kendler, K., & Prescott, C. (1998). Cannabis use, abuse, and dependence in a population-based sample of female twins. *American Journal of Psychiatry, 155*, 1016–1022.
- Kepper, A., van den Eijnden, R., Monshouwer, K., & Vollebergh, W. (2014). Understanding the elevated risk of substance use by adolescents in special education and residential youth care: The role of individual, family and peer factors. *European Child & Adolescent Psychiatry, 23*, 461–472.
- Kerr, T., Stoltz, J. A., Marshall, B., Lai, C., Strathdee, S. A., & Wood, E. (2009). Childhood trauma and injection drug use among high-risk youth. *Journal of Adolescent Health, 45*, 300–302.
- Keyes, K., Vo, T., Wall, M., Caetano, R., Suglia, S., Martins, S., ... Hasin, D. (2015). Racial/ethnic differences in use of alcohol, tobacco, and marijuana: Is there a cross-over from adolescence to adulthood? *Social Science & Medicine, 124*, 132–141.
- Khan, M. R., Berger, A., Wells, B., & Cleland, C. (2012). Longitudinal associations between adolescent alcohol use and adulthood sexual risk behavior and sexually transmitted infection in the United States: Assessment of differences by race. *American Journal of Public Health, 102*, 867–76.
- Kilpatrick, D. G., Acierno, R., Saunders, B., Resnick, H. S., Best, C. L., & Schnurr, P. P. (2000). Risk factors for adolescent substance abuse and dependence: Data from a national sample. *Journal of Consulting and Clinical Psychology, 68*, 19–30.
- Kim-Spoon, J., Farley, J. P., Holmes, C. J., & Longo, G. S. (2014). Does adolescents' religiousness moderate links between harsh parenting and adolescent substance use? *Journal of Family Psychology, 28*, 739–748.
- King, K., & Chassin, L. (2007). A prospective study of the effects of age initiation of alcohol and drug use on young adult substance dependence. *Journal of Studies on Alcohol and Drugs, 256–265*.
- King, K., Meehan, B., Trim, R., & Chassin, L. (2006). Marker or mediator? The effects of adolescent substance use on young adult educational attainment. *Addiction, 101*, 1730–1740.
- King, S., Iacono, W., & McGue, M. (2004). Childhood externalizing and internalizing psychopathology in the prediction of early substance use. *Addiction, 99*, 1548–1559.

- Kington, Y. S., & O' Sullivan, A. L. (2001). The Family as a protective asset in adolescent development. *Journal of Holistic Nursing, 19*, 102–121.
- Kirchoff, A., Krull, K., Ness, K., Park, E., Oeffinger, K., Hudson, M., ... Leisenring, W. (2011). Occupational outcomes of adult childhood cancer survivors. *Cancer, July*, 3033–3044.
- Klein, K., Forehand, R., Armistead, L., & Long, P. (1997). Delinquency during the transition to early adulthood: Family and parenting predictors from early adolescence. *Adolescence, 32*, 61–80.
- Kliewer, W., & Murrelle, L. (2007). Risk and protective factors for adolescent substance use: Findings from a study in selected Central American countries. *Journal of Adolescent Health, 40*, 448–455.
- Kosterman, R., Hawkins, J., Guo, J., Catalano, R., & Abbot, R. (2000). The dynamics of alcohol and marijuana initiation: Patterns and predictors of first use in adolescence. *American Journal of Public Health, 90*, 360–366.
- Krohn, M. D., Hall, G. P., & Lizotte, A. J. (2009). Family transitions and later delinquency and drug use. *Journal of Youth and Adolescence, 38*, 466–480.
- Kuhn, C. (2015). Emergence of sex differences in the development of substance use and abuse during adolescence. *Pharmacology & Therapeutics, 153*, 55–78.
- Lang, K., & Zagorsky, J. L. (2001). Does growing up with a parent absent really hurt? *The Journal of Human Resources, 36*, 253–273.
- Larson, R., & Angus, R. (2011). Adolescents' development of skills for agency in youth programs: Learning to think strategically. *Child Development, 82*, 277–294.
- Lemos, I., & Faísca, L. (2015). Psychosocial adversity, delinquent pathway and internalizing psychopathology in juvenile male offenders. *International Journal of Law and Psychiatry, 42–43*, 49–57.
- Lessem, J., Hopper, C., Haberstick, B., Timberlake, D., Ehringer, M., Smolen, A., & Hewitt, J. (2006). Relationship between adolescent marijuana use and young adult illicit drug use. *Behavior Genetics, 36*, 498–506.
- Lewinsohn, P., Roberts, R., Seeley, J., Rohde, P., Gotlib, I., & Hops, H. (1994). Adolescent psychopathology II: Psychosocial risk factors for depression. *Journal of Abnormal Psychology, 103*, 302–315.
- Liang, W., & Chikritzhs, T. (2015). Age at first use of alcohol predicts the risk of heavy alcohol use in early adulthood: A longitudinal study in the United States. *International Journal of Drug Policy, 26*, 131–134.

- Lo, C. C., & Cheng, T. C. (2007). The impact of childhood maltreatment on young adults' substance abuse. *The American Journal of Drug and Alcohol Abuse*, *33*, 139–146.
- Lohaus, A., Vierhaus, M., & Ball, J. (2009). Parenting styles and health-related behavior in childhood and early adolescence: Results of a longitudinal study. *Journal of Early Adolescence*, *29*, 449–475.
- Lopoo, L., & Deleire, T. (2014). Family structure and the economic well-being of children in youth and adulthood. *Social Science Research*, *43*, 30–44.
- Luthar, S., & Cushing, G. (1999). Neighborhood influences and child development: A prospective study of substance abusers' offspring. *Development and Psychopathology*, *11*, 763–784.
- Lynch, A. D., Coley, R. L., Sims, J., Lombardi, C. M., & Mahalik, J. R. (2015). Direct and interactive effects of parent, friend and schoolmate drinking on alcohol use trajectories. *Psychology & Health*, *30*, 1183–1205.
- Maggs, J. L., Patrick, M. E., & Feinstein, L. (2008). Childhood and adolescent predictors of alcohol use and problems in adolescence and adulthood in the National Child Development Study. *Addiction*, *103*, 7–22.
- Mahalik, J., Coley, R., Lombardi, C., Lynch, A., Markowitz, A., & Jaffee, S. (2013). Changes in health risk behaviors for males and females from early adolescence through early adulthood. *Health Psychology*, *32*, 685–694.
- Mahalik, J., Lombardi, C., Sims, J., Coley, R., & Lynch, A. (2015). Gender, male-typicality, and social norms predicting adolescent alcohol intoxication and marijuana use. *Social Science & Medicine*, *143*, 71–80.
- Malowsky, J., Schulenberg, J. E., & Zucker, R. A. (2014). Influence of conduct problems and depressive symptomatology on adolescent substance use: Developmentally proximal versus distal effects. *Developmental Psychology*, *50*, 1179–1189.
- Marmorstein, N. R., & Iacono, W. G. (2001). An investigation of female adolescent twins with both major depression and conduct disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, *40*, 299–306.
- Marshall, E. J. (2014). Adolescent alcohol use: Risks and consequences. *Alcohol and Alcoholism*, *49*, 160–164.
- Marta, E. (1997). Parent–adolescent interactions and psychosocial risk in adolescents: An analysis of communication, support and gender. *Journal of Adolescence*, *20*, 473–487.

- Martin-Storey, A., & Crosnoe, R. (2014). Perceived neighborhood safety and adolescent school functioning. *Applied Developmental Science, 18*, 61–75.
- Mason, M. J., Schmidt, C., & Mennis, J. (2012). Dimensions of religiosity and access to religious social capital: Correlates with substance use among urban adolescents. *Journal of Primary Prevention, 33*, 229–237.
- Maternal and Child Health Bureau. (2010). *Rethinking MCH: The Life Course Model as an organizing framework-concept paper*. Washington, DC.
- May, J., Osmond, K., & Billick, S. (2014). Juvenile delinquency treatment and prevention : A literature review. *Psychiatric Quarterly, 85*, 295–301.
- McCord, J. (1991). Family relationships, juvenile delinquency, and adult criminality. *Criminology, 29*, 397–417.
- McGue, M., Iacono, W. G., Legrand, L. N., Malone, S., & Elkins, I. (2001). Origins and consequences of age at first drink. Associations with substance-use disorders, disinhibitory behavior, psychopathology, and P3 amplitude. *Alcoholism: Clinical and Experimental Research, 25*, 1156–1165.
- Mednick, B., Baker, R., & Carothers, L. (1990). Patterns of family instability and crime: The association of timing of the family's disruption with subsequent adolescent and young adult criminality. *Journal of Youth and Adolescence, 19*, 201–220.
- Merline, A., O'Malley, P., & Schulenberg, J. (2004). Substance use among adults 35 years of age: Prevalence, adulthood predictors, and impact of adolescent substance use. *American Journal of Public Health, 94*, 96–102.
- Merton, R. K. (1968). The Matthew Effect in science: The reward and communication system of science. *Science, 199*, 55–63.
- Merton, R. K. (1988). The Matthew Effect II: Cumulative advantage and the symbolism of intellectual property. *Isis, 79*, 606–623.
- Milam, A., Furr-Holden, C., & Leaf, P. (2010). Perceived school and neighborhood safety, neighborhood violence and academic achievement in urban school children. *The Urban Review, 42*, 458–467.
- Mitchell, M. (2010). Re: st: How to deal with missing values while running an ordinal logistic regression. Retrieved from <http://www.stata.com/statalist/archive/2010-04/msg01281.html>
- Modecki, K., Barber, B., & Eccles, J. (2014). Binge drinking trajectories across adolescence: For early maturing youth, extra-curricular activities are protective. *The Journal of Adolescent Health : Official Publication of the Society for Adolescent Medicine, 54*, 61–66.

- Moen, P. (1997). Women's roles and resilience: Trajectories of advantage or turning points? In L. Gotlib & B. Wheaton (Eds.), *Stress and adversity over the life course: Trajectories and turning points* (pp. 133–137). New York: Cambridge University Press.
- Molnar, B. E., Buka, S. L., & Kessler, R. C. (2001). Child sexual abuse and subsequent psychopathology: Results from the National Comorbidity Survey. *American Journal of Public Health, 91*, 753–760.
- Morean, M., Kong, G., Camenga, D., Cavallo, D., Connell, C., & Krishnan-Sarin, S. (2014). First drink to first drunk: Age of onset and delay to intoxication are associated with adolescent alcohol use and binge drinking. *Alcoholism: Clinical and Experimental Research, 38*, 2615–2621.
- Mullers, E. S., & Dowling, M. (2008). Mental health consequences of child sexual abuse. *British Journal of Nursing, 17*, 1428–1433.
- Mulye, T., Park, M., Nelson, C., Adams, S., Irwin, C., & Brindis, C. (2009). Trends in adolescent and young adult health in the United States. *The Journal of Adolescent Health, 45*, 8–24.
- Mundt, M. P. (2011). The impact of peer social networks on adolescent alcohol use initiation. *Academic Pediatrics, 11*, 414–421.
- National Center for O*NET Development. (2016). SOC Crosswalk database version 20.3. Retrieved from www.onetonline.org
- National Center on Addiction and Substance Abuse. (2011). *Adolescent substance use: America's #1 Public Health problem*. New York: Columbia University.
- National Institute on Drug Abuse. (2003). Preventing drug use among children and adolescents (In Brief). Retrieved from <https://www.drugabuse.gov/publications/preventing-drug-abuse-among-children-adolescents/chapter-1-risk-factors-protective-factors/what-are-risk-factors>
- National Institute on Drug Abuse. (2008). *Principles of adolescent substance use disorder treatment: A research-based guide*. Rockville: Department of Health and Human Services.
- National Institute on Drug Abuse. (2011). *Drug facts: Treatment statistics*. Rockville: Department of Health and Human Services.
- National Institute on Drug Abuse. (2012). *Understanding drug abuse and addiction*. Rockville: Department of Health and Human Services.
- National Institute on Drug Abuse. (2014). *Drug facts: High school and youth trends*. Rockville: Department of Health and Human Services.

- National Research Council. (1993). *Losing generations: Adolescents in high-risk settings*. Washington, D.C.: National Academy Press.
- National Research Council & Institute of Medicine. (2009). *National Research Council/ Institute of Medicine Adolescent Health Services: Highlights and considerations for state health policymakers*.
- Newcomb, M. D. (1997). Psychosocial predictors and consequences of drug use : A developmental perspective within a prospective study. *Journal of Addictive Diseases, 16*, 51–89.
- Newcomb, M. D., & Bentler, P. M. (1988). *Consequences of adolescent drug use: Impact on the lives of young adults*. Beverly Hills, CA: Sage.
- Newcomb, M. D., & Felix-Ortiz, M. (1992). Multiple protective and risk factors for drug use and abuse: Cross-sectional and prospective findings. *Journal of Personality and Social Psychology, 63*, 280–296.
- Nosek, B. (2014). Replicability in the social and behavioral sciences. Retrieved from <https://obsr.od.nih.gov/replicability-in-the-social-and-behavioral-sciences/>
- O’Rand, A. M. (1996). The precious and precocious: Understanding cumulative disadvantage and cumulative advantage over the life course. *The Gerontologist, 36*, 230–238.
- Oggers, C., Caspi, A., Nagin, D., Piquero, A., Slutske, W., Milne, B., ... Moffitt, T. (2008). Is it important to prevent early exposure to drugs and alcohol among adolescents? *Psychological Science, 19*, 1037–1044.
- Okunseri, C., Okunseri, E., Garcia, R., Visotcky, A., & Szabo, A. (2013). Predictors of dental care use: Findings from the National Longitudinal Study of Adolescent Health. *Journal of Adolescent Health, 53*, 663–670.
- Ostaszewski, K., & Zimmerman, M. (2006). The effects of cumulative risks and promotive factors on urban adolescent alcohol and other drug use: A longitudinal study of resiliency. *American Journal of Community Psychology, 38*, 237–249.
- Oxford English Dictionary Online. (2016). Adolescence. Retrieved from http://www.oxforddictionaries.com/us/definition/american_english/adolescence
- Pardini, B. (2011). *The National Longitudinal Study of Adolescent Health (Add Health): Wave IV, 2007–2008: A User’s Guide to the Machine-Readable Files and Documentation (Dataset T2T8)*. Los Altos, CA: Sociometrics Corporation.
- Pardini, D. A., Loeber, R., Farrington, D. P., & Stouthamer-Loeber, M. (2012). Identifying direct protective factors for nonviolence. *American Journal of Preventive Medicine, 43*, 28–40.

- Parent, A., Teilmann, G., Juul, A., Skakkebaek, N., Toppari, J., & Bourguignon, J. (2003). The timing of normal puberty and the age limits of sexual precocity: Variations around the world, secular trends, and changes after migration. *Endocrine Reviews*, *24*, 668–693.
- Patrick, M. E., & O'Malley, P. M. (2015). Trends in drug use among youth in the United States. In L. M. Scheier (Ed.), *Handbook of adolescent drug use prevention: Research, intervention strategies, and practice* (2nd ed., pp. 1–575). Washington, D.C.: American Psychological Association.
- Piehler, T. F., Veronneau, M. H., & Dishion, T. J. (2012). Substance use progression from adolescence to early adulthood: Effortful control in the context of friendship influence and early onset use. *Journal of Abnormal Child Psychology*, *40*, 1045 – 1058.
- Price, D. (1976). A general theory of Bibliometric and other cumulative advantage processes. *Journal of the American Society for Information Science*, *September*, 292–306.
- Public Agenda. (1999). *Kids these days '99: What Americans really think about the next generation*. New York.
- Queiros, F., Wehby, G., & Halpern, C. (2015). Developmental disabilities and socioeconomic outcomes in young adulthood. *Public Health Reports*, *130*, 213–221.
- Rao, U., Daley, S., & Hammen, C. (2000). Relationship between depression and substance use disorders in adolescent women in the transition to adulthood. *Journal of the American Academy of Child and Adolescent Psychiatry*, *39*, 215–222.
- Reboussin, B. A., Preisser, J. S., Song, E.-Y., & Wolfson, M. (2010). Geographic clustering of underage drinking and the influence of community characteristics. *Drug and Alcohol Dependence*, *106*, 38–47.
- Reeb, B. T., Chan, S. Y., Conger, K. J., Martin, M. J., Hollis, N. D., Serido, J., & Russell, S. T. (2015). Prospective effects of family cohesion on alcohol-related problems in adolescence: Similarities and differences by race/ethnicity. *Journal of Youth and Adolescence*, *44*, 1941–1953.
- Reef, J., Diamantopoulou, S., Meurs, I. V., Verhulst, F. C., & Ende, J. (2011). Developmental trajectories of child to adolescent externalizing behavior and adult DSM-IV disorder: Results of a 24-year longitudinal study. *Society of Psychiatry and Psychiatric Epidemiology*, *46*, 1233–1241.
- Rees, C., & Wallace, D. (2015). Reprint of: The myth of conformity: Adolescents and abstention from unhealthy drinking behaviors. *Social Science & Medicine*, *125*, 151–162.

- Resnick, M., Bearman, P., Blum, R., Bauman, K., Harris, K., Jones, J., ... Udry, J. R. (1997). Protecting adolescents from harm: Findings from the National Longitudinal Study on Adolescent Health. *The Journal of the American Medical Association*, *278*, 823–832.
- Respress, B., Small, E., Francis, S., & Cordova, D. (2013). The role of perceived peer prejudice and teacher discrimination on adolescent substance use: A social determinants approach. *Journal of Ethnicity in Substance Abuse*, *12*, 279–99.
- Richter, L. (2006). Studying adolescence. *Science*, *312*, 1902–1905.
- Roberts, B. W., & Caspi, A. (2003). The cumulative continuity model of personality development: Striking a balance between continuity and change in personality traits across the life course. In R. M. Staudinger & U. Lindenberger (Eds.), *Understanding human development: Lifespan psychology in exchange with other disciplines* (pp. 183–214). Dordrecht, NL: Kluwer Academic Publishers.
- Roberts, B. W., & Wood, D. (2006). Personality development in the context of the neo-socioanalytic model of personality. In K. D. Little & T. D. Mroczek (Eds.), *Handbook of personality development* (pp. 11–39). Mahwah: Erlbaum.
- Rouse, K. A., & Ingersoll, G. M. (1998). Longitudinal health endangering behavior risk among resilient and nonresilient early adolescents. *Journal of Adolescent Health*, *23*, 297–302.
- Ryan, S., Jorm, A., & Lubman, D. (2010). Parenting factors associated with reduced adolescent alcohol use: A systematic review of longitudinal studies. *Australian and New Zealand Journal of Psychiatry*, *44*, 774–783.
- Salas-Wright, C. P., Vaughn, M. G., Hodge, D. R., & Perron, B. E. (2012). Religiosity profiles of American youth in relation to substance use, violence, and delinquency. *Journal of Youth and Adolescence*, *41*, 1560–1575.
- Salazar, L. F., Diclemente, R. J., Wingood, G. M., Crosby, R. A., Harrington, K., Hook, E., ... Oh, M. K. (2004). Self-concept and adolescents' refusal of unprotected sex: A test of mediating mechanisms among African American girls. *Prevention Science*, *5*, 137–149.
- Sameroff, A. J., Bartko, W. T., Baldwin, A., Baldwin, C., & Siefer, R. (1998). Family and social influences on the development of child competence. In M. Lewis & C. Feiring (Eds.), *Families, risk, and competence* (pp. 161–185). Mahwah, NJ: Erlbaum.
- Sampson, R. J., & Laub, J. H. (1993). *Crime in the making: Pathways and turning points through life*. Cambridge, MA: Harvard University Press.

- Scheier, L. M., Botvin, G. J., & Miller, N. L. (1999). Life events, neighborhood stress, psychosocial functioning, and alcohol use among urban minority youth. *Journal of Child & Adolescent Substance Abuse*, 9, 19–50.
- Schlauch, R., Levitt, A., Connell, C., & Kaufman, J. (2013). The moderating effect of family involvement on substance use risk factors in adolescents with severe emotional and behavioral challenges. *Addictive Behaviors*, 38, 2333–2342.
- Schulte, M., Ramo, D., & Brown, S. (2009). Gender differences in factors influencing alcohol use and drinking progression among adolescents. *Clinical Psychology Review*, 29, 535–47.
- Schulz, R., & Heckhausen, J. (1996). A life span model of successful aging. *American Psychologist*, 51, 702–14.
- Schuster, C., O'Malley, P. M., Bachman, J. G., Johnston, L. D., & Schulenberg, J. (2001). Adolescent marijuana use and adult occupational attainment: A longitudinal study from age 18 to 28. *Substance Use Misuse*, 36, 997–1014.
- Shanahan, M. (2000). Pathways to adulthood in changing societies: Variability and mechanisms in life course perspective. *Annual Review of Sociology*, 26, 667–692.
- Shin, S., Edwards, E. M., & Heeren, T. (2009). Child abuse and neglect: Relations to adolescent binge drinking in the National Longitudinal Study of Adolescent Health (AddHealth) Study. *Addictive Behaviors*, 34, 277–280.
- Sloboda, Z. (2015). Vulnerability and risks: Implications for understanding etiology and drug use prevention. In L. M. Scheier (Ed.), *Handbook of adolescent drug use prevention: Research, intervention strategies, and practice* (2nd ed., pp. 85–100). Washington, DC: American Psychological Association.
- Sourander, A., Jensen, P., Davies, M., Elonheimo, H., Ristkari, T., Helenius, H., ... Almqvist, F. (2007). Who is at greatest risk of adverse long-term outcomes? The Finnish From a Boy to a Man Study. *Journal of American Academy of Child and Adolescent Psychiatry*, 46, 1148–1161.
- Spoth, R., Gyll, M., & Day, S. (2002). Universal family-focused interventions in alcohol-use disorder prevention: Cost-effectiveness and cost-benefit analyses of two interventions. *Journal of Studies on Alcohol*, (March), 219–228.
- Staff, J., Patrick, M. E., Loken, E., & Maggs, J. L. (2008). Teenage alcohol use and educational attainment. *Journal of Studies on Alcohol and Drugs*, 69, 848–858.
- StataCorp. (2015). Stata Statistical Software: Release 14.1. College Station, TX: StataCorp LP.

- Stewart, M., Reid, G., & Mangham, C. (1997). Fostering children's resilience. *Journal of Pediatric Nursing, 12*, 21–31.
- Stockwell, T., Toumbourou, J., Letcher, P., Smart, D., Sanson, A., & Bond, L. (2004). Risk and protection factors for different intensities of adolescent substance use: When does the prevention paradox apply? *Drug and Alcohol Review, 23*, 67–77.
- Stone, A., Becker, L., Huber, A., & Catalano, R. (2012). Review of risk and protective factors of substance use and problem use in emerging adulthood. *Addictive Behaviors, 37*, 747–775.
- Stouthamer-Loeber, M., Wei, E., Loeber, R., & Mastenb, A. S. (2004). Desistance from persistent serious delinquency in the transition to adulthood. *Development and Psychopathology, 16*, 897–918.
- Stronski, S., Ireland, M., Michaud, P., Narring, F., & Resnick, M. (2000). Protective correlates of stages in adolescent substance use: A Swiss National Study. *Journal of Adolescent Health, 26*, 420–427.
- Substance Abuse and Mental Health Services Administration. (2003). *Results from the 2002 National Survey on Drug Use and Health: Detailed tables, [electronic]*. Rockville: Department of Health and Human Services. Retrieved from <http://www.samhsa.gov/>
- Substance Abuse and Mental Health Services Administration. (2012). *Results from the 2011 National Survey on Drug Use and Health: Summary of national findings*. Rockville: Department of Health and Human Services.
- Substance Abuse and Mental Health Services Administration. (2014). *Results from the 2013 National Survey on Drug Use and Health: Summary of national findings. NSDUH Series H-48, HHS Publication No. (SMA) 14-4863*. Rockville: Department of Health and Human Services.
- Svensson, M., & Hagquist, C. (2010). Adolescent alcohol and illicit drug use among first- and second-generation immigrants in Sweden. *Scandinavian Journal of Public Health, 38*, 184–191.
- Tabler, J., & Utz, R. L. (2015). The influence of adolescent eating disorders or disordered eating behaviors on socioeconomic achievement in early adulthood. *International Journal of Eating Disorders, 48*, 622–632.
- Tucker, J. S., de la Haye, K., Kennedy, D. P., Green, H. D., & Pollard, M. S. (2014). A prospective study of marijuana use change and cessation among adolescents. *Drug and Alcohol Dependence, 144*, 134–140.

- U.S. Census Bureau. (2014). *Annual estimates of the resident population by sex, age, race, and Hispanic origin for the United States and States: April 1, 2010 to July 1, 2013*.
- Uggen, C., & Massoglia, M. (2004). Desistance from crime and deviance as a turning point in the life course. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the life course* (pp. 311–329). New York, NY: Springer.
- Vaillant, G. (2002). *Aging well*. Boston, MA: Little, Brown and Co.
- van der Vorst, H., Engels, R. C., Meeus, W., Dekovic, M., & Van Leeuwe, J. (2005). The role of alcohol-specific socialization in adolescents' drinking behaviour. *Addiction, 100*, 1464–1476.
- Veldman, K., Bultmann, U., Almansa, J., & Reijneveld, S. A. (2015). Childhood adversities and educational attainment in young adulthood: The role of mental health problems in adolescence. *Journal of Adolescent Health, 57*, 462–467.
- Viner, R. M., Ozer, E. M., Denny, S., Marmot, M., & Resnick, M. (2012). Adolescent Health 2: Adolescence and the social determinants of health. *The Lancet, April/May*, 1641–1652.
- Vogel, M., Rees, C. E., Mccuddy, T., & Carson, D. C. (2015). The highs that bind: School context, social status and marijuana use. *Journal of Youth and Adolescence, 44*, 1153–1164.
- von Stumm, S., Deary, I., Kivimä, M., Jokela, M., Clark, H., & Batty, G. (2011). Childhood behavior problems and health at midlife: 35-year follow-up of a Scottish birth cohort. *Journal of Child Psychology and Psychiatry, 52*, 992–1001.
- Wang, M., Matthew, R., Bellamy, N., & James, S. (2005). A structural model of the substance use pathways among minority youth. *American Journal of Health Behavior, 29*, 531–541.
- Watt, N., David, J., Ladd, K., & Shamos, S. (1995). The life course of psychological resilience: A phenomenological perspective on deflecting life's slings and arrows. *15*, 209–246.
- Watts, S. J., & McNulty, T. L. (2013). Childhood abuse and criminal behavior: Testing a general Strain Theory model. *Journal of Interpersonal Violence, 28*, 3023–3040.
- Weinberg, N. (2001). Risk factors for adolescent substance abuse. *Journal of Learning Disabilities, 34*, 343–351.
- Welte, J., & Barnes, G. (1987). Alcohol use among adolescent minority groups. *Journal of Studies on Alcohol, 48*, 329–336.

- Werner, E. E., & Smith, R. S. (2001). *Journeys from childhood to midlife: Risk, resilience, and recovery*. Ithaca, NY: Cornell University Press.
- White, H., McMorris, B., Catalano, R., Fleming, C., Haggerty, K., & Abbott, R. (2006). Increases in alcohol and marijuana use during the transition out of high school into emerging adulthood: The effects of leaving home, going to college, and high school protective factors. *Journal of Studies on Alcohol*, *67*, 810–822.
- Williams, A., & Merten, M. (2014). Linking community, parenting, and depressive symptom trajectories: Testing resilience models of adolescent agency based on race/ethnicity and gender. *Journal of Youth and Adolescence*, *43*, 1563–1575.
- Wilson, A. E., Shuey, K. M., & Elder, G. H. (2007). Cumulative advantage processes as mechanisms in life course health. *American Journal of Sociology*, *112*, 1886–924.
- Wongtongkam, N., Ward, P. R., Day, A., & Winefield, A. H. (2014). The influence of protective and risk factors in individual, peer and school domains on Thai adolescents' alcohol and illicit drug use: A survey. *Addictive Behaviors*, *39*, 1447–1451.
- World Health Organization. (2014). *Health for the world's adolescents: A second chance in the second decade*. Geneva.
- Yan, A., Chiu, Y., Stoesen, C., & Wang, M. (2007). STD-/HIV-related sexual risk behaviors and substance use among U.S. rural adolescents. *Journal of the National Medical Association*, *99*, 1386–1394.
- Zaff, J. F., & Michelsen, E. (2002). *Encouraging civic engagement: How teens are (or are not) becoming responsible citizens*. Washington, D.C.: Child Trends.

Appendix

Study Variables

Variable Name	Description	Wave	Type of Risk/Protective Factor
<i>Race/Ethnicity</i>	Predictor	Wave I	Individual
<i>Gender</i>	Predictor	Wave I	Individual
<i>Age</i>	Predictor	Wave I	Individual
<i>Grade Level</i>	Predictor	Wave I	Individual
<i>Child Maltreatment (Physical Abuse)</i>	Predictor	Wave IV	Individual
<i>Child Maltreatment (Sexual Abuse)</i>	Predictor	Wave IV	Individual
<i>Religiosity (Frequency of Service Attendance)</i>	Predictor	Wave I	Individual
<i>Religiosity (Importance of Religion)</i>	Predictor	Wave I	Individual
<i>Religiosity (Frequency of Prayer)</i>	Predictor	Wave I	Individual
<i>Externalizing Behavior (Physical Fights)</i>	Predictor	Wave I	Individual
<i>Externalizing Behavior (Suspension)</i>	Predictor	Wave I	Individual
<i>Externalizing Behavior (Expulsion)</i>	Predictor	Wave I	Individual
<i>Externalizing Behavior (Getting Along with Teachers)</i>	Predictor	Wave I	Individual
<i>Internalizing Behavior (Feeling Depressed)</i>	Predictor	Wave I	Individual
<i>Internalizing Behavior (Feeling Blue)</i>	Predictor	Wave I	Individual
<i>Family Dynamics (Cohesiveness-Having Fun Together)</i>	Predictor	Wave I	Interpersonal
<i>Family Dynamics (Parenting1-Decide Own Curfew on Weekends)</i>	Predictor	Wave I	Interpersonal
<i>Family Dynamics (Parenting2-Allowed to Choose Own Friends)</i>	Predictor	Wave I	Interpersonal

<i>Family Dynamics (Access to Drugs in the Home)</i>	Predictor	Wave I	Interpersonal
<i>Family Dynamics (Access to Alcohol in the Home)</i>	Predictor	Wave I	Interpersonal
<i>Peer AOD Use (Alcohol)</i>	Predictor	Wave I	Interpersonal
<i>Peer AOD Use (Marijuana)</i>	Predictor	Wave I	Interpersonal
<i>School Environment (Satisfaction)</i>	Predictor	Wave I	Environment
<i>School Environment (Feeling Safe)</i>	Predictor	Wave I	Environment
<i>Neighborhood Environment (Satisfaction)</i>	Predictor	Wave I	Environment
<i>Neighborhood Environment (Feeling Safe)</i>	Predictor	Wave I	Environment
<i>Educational Achievement</i>	Primary Outcome	Wave IV	N/A
<i>Occupational Status</i>	Primary Outcome	Wave IV	N/A
<i>Household Income</i>	Secondary Outcome	Wave IV	N/A
<i>Criminal Justice System Involvement</i>	Secondary Outcome	Wave IV	N/A

Alcohol & Other Drug Questions

The following questions were used to measure respondent AOD use at Wave I.

Alcohol

“Have you had a drink of beer, wine, or liquor—not just a sip or a taste of someone else’s drink—more than 2 or 3 times in your life?”

Marijuana

“How old were you when you tried marijuana for the first time? If you never tried marijuana, enter “0.”

Cocaine

“How old were you when you tried any kind of cocaine— including powder, freebase, or crack cocaine—for the first time? If you never tried cocaine, enter “0.”

Inhalants

“How old were you when you tried inhalants, such as glue or solvents, for the first time? If you never tried inhalants such as these, enter “0.”

Other Illegal Drugs

“How old were you when you first tried any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, heroin, or pills, without a doctor’s prescription? If you never tried any other type of illegal drug, enter “0.”

Injection Drugs

“During your life, have you ever injected (shot up with a needle) any illegal drug, such as heroin, or cocaine?”

Outcome Variables – Wave IV

Educational Attainment

Educational Attainment was measured by the respondent’s self-reported response to one question in Wave IV. “What is the highest level of education that you have achieved to date?”

1= No high school diploma

2= High school graduate

3= Vocational/technical training or some college (after high school)

4= Completed college

5= Completed post baccalaureate professional education (master's, doctoral, law, medical degrees)

Occupational Status

Occupational Status was measured by the respondent's self-reported response to one question in Wave IV. "Which one of the following categories best describes what you're doing now? Now I'd like to record a description of your (current/most recent) job. When you see the list of categories, please tell me which best describes what you (do/did) at your (current/most recent) job." Respondents then chose their current occupation which was assigned a 6-digit 2010 Standard Occupational Classification (SOC) System code based on a hierarchical system developed by the Bureau of Labor Statistics with 461 broad occupations, 97 minor groups, and 23 major groups. SOC codes were then entered into the SOC Crosswalk created by the Occupational Information Network (O*NET) classification and database version 20.3 which assigned each occupation to one of 5 Zones.

Zone 1= occupations which don't require a high school diploma

Zone 2= occupations which require a high school diploma

Zone 3= occupations which require vocational/technical training after high school

Zone 4= occupations which require a bachelor's degree

Zone 5= occupations which require post baccalaureate professional education

(Master's, Doctoral, Law, Medical Degrees etc.)

Household Income

Income was measured by the respondent's self-reported response to one question in Wave IV. "Thinking about your income and the income of everyone who lives in your

household and contributes to the household budget, what was the total household income before taxes and deductions in {2006/2007/2008}? Include all sources of income, including non-legal sources.”

1=less than \$5,000 or equal to \$29,999

2= \$30,000 to \$49,999

3= \$50,000 to \$74,999

4= \$75,000 to \$99,999

5= \$100,000 or more

Criminal Justice System

Criminal Justice System was measured by the respondent’s self-reported response to one question in Wave IV. “Have you ever been arrested?”

0 = No

1 = Yes

Predictor Variables – Wave I

Gender

Gender was measured by the adolescent’s self-reported response to one question in Wave I. “What sex are you?”

1=Male

2=Female

Age

Age was measured by the adolescent’s self-reported response to two questions in Wave I. “What is your birth month?” and “What is your birth year?”

19=19 years

18=18 years

17=17 years

16=16 years

15=15 years

14=14 years

13=13 years

Age was then calculated using a formula devised by statisticians at Add Health (Harris et al., 2009) which utilized respondents' birth month, the 15th day of the month for all respondents due to missing data for actual birthdate, birth year, and the year the Wave I interview was conducted (1994 or 1995). The variable was then coded by Add Health statisticians with descending values which ranged from 19 to 13 years for the present study.

Grade Level

Grade level was measured by the adolescent's self-reported response to one question in Wave I. "What grade are you in?"

9=9th

10=10th

11=11th

12=12th

Race/Ethnicity

Race/Ethnicity was measured by the adolescent's self-reported responses to two questions in Wave I. The present study combined the two variables of *Hispanic Ethnicity* and *Race* into one variable which is referred to as Race/Ethnicity as other researchers have done when analyzing Add Health data (Allen, McNeely, & Orme, 2016).

Respondents were asked, "Are you of Hispanic or Spanish origin?" Values included 0=No and 1=Yes, as well as, "What is your race?" Values were 1=White, 2=Black or African-American, 3=Native American or American Indian, 4=Asian or Pacific Islander, and 5=Other (Multiracial-for respondents who chose more than one racial category).

1= Non-Latino White

2= Non-Latino Black or African-American

3= Non-Latino Native American or American Indian

4= Non-Latino Asian or Pacific Islander

5= Non-Latino Multi-Racial or "Other"

6= Latino

Child Maltreatment- Questions regarding child maltreatment were asked retrospectively once adolescents were adults in Waves III and IV. The following questions are from Wave IV.

Child Maltreatment- Measured by Frequency of Physical Abuse

Frequency of Physical Abuse was measured by the adolescent's self-reported response to one question in Wave I. "Before your 18th birthday, how often did a parent or adult

caregiver hit you with a fist, kick you, or throw you down on the floor, into a wall, or down stairs?”

0= this has never happened

1= one time

2= two times

3= three to five times

4= six to ten times

5= more than ten times

Child Maltreatment- Measured by Frequency of Sexual Abuse

Frequency of Sexual Abuse was measured by the adolescent’s self-reported response to one question in Wave I. “Before your 18th birthday, how often did a parent or other adult caregiver touch you in a sexual way, force you to touch him or her in a sexual way, or force you to have sexual relations?”

0= this has never happened

1= one time

2= two times

3= three to five times

4= six to ten times

5= more than ten times

Religiosity- Measured by Religious Service Attendance

Frequency of Religious Service Attendance was measured by the adolescent’s self-reported response to one question in Wave I. “In the past 12 months, how often did you attend religious services?”

1= once a week or more

2= once a month or more, but less than once a week

3= less than once a month

4= never

Religiosity- Measured by Importance of Religion

Importance of Religion was measured by the adolescent's self-reported response to one question in Wave I. "How important is religion to you?"

1= very important

2= fairly important

3= fairly unimportant

4= not important at all

Religiosity- Measured by Frequency of Prayer

Frequency of Prayer was measured by the adolescent's self-reported response to one question in Wave I. "How often do you pray?"

1= at least once a day

2= at least once a week

3= at least once a month

4= less than once a month

5= never

Externalizing Behaviors- Measured by Physical Fights

Frequency of Physical Fights was measured by the adolescent's self-reported response to one question in Wave I. "During the past 12 months, how often did each of the following things happen?", "You got into a physical fight?"

0 = never

1 = once

2 = more than once

Externalizing Behaviors- Measured by Suspended from School

Suspended from School was measured by the adolescent's self-reported response to one question in Wave I. "Have you ever received an out-of-school suspension from school?"

0 = no

1 = yes

Externalizing Behaviors- Measured by Expelled from School

Expelled from School was measured by the adolescent's self-reported response to one question in Wave I. "Have you ever been expelled from school?"

0 = no

1 = yes

Externalizing Behaviors- Measured by Getting Along with Teachers

Frequency of Having Trouble Getting Along with Teachers was measured by the adolescent's self-reported response to one question in Wave I. "Since school started this year, how often have you had trouble/During the 1994-1995 school year, how often did you have trouble: *Getting Along with Your Teachers?*"

0 = never

1= just a few times

2=about once a week

3=almost everyday

4=everyday

Internalizing Behaviors- Measured by Feeling Depressed

Frequency of Feeling Depressed was measured by the adolescent's self-reported response to one question in Wave I. "These questions will ask about how you feel emotionally and about how you feel in general. How often was each of the following things true during the past week? You felt depressed?"

0 = never or rarely

1 = sometimes

2 = a lot of the time

3 = most of the time or all of the time

Internalizing Behaviors- Measured by Feeling Blue

Frequency of Feeling the Blues was measured by the adolescent's self-reported response to one question in Wave I. "These questions will ask about how you feel emotionally and about how you feel in general. How often was each of the following things true during the past week? You felt that you could not shake off the blues, even with help from your family and your friends."

0 = never or rarely

1 = sometimes

2 = a lot of the time

3 = most of the time or all of the time

Family Dynamics- Measured by Family Cohesiveness

Frequency of experiencing fun as a family (Family Cohesiveness) was measured by the adolescent's self-reported response to one question in Wave I. "How much do you feel that you and your family have fun together?"

1=not at all

2=very little

3=somewhat

4=quite a bit

5=very much

Family Dynamics- Measured by Family & Parenting 1

Family Dynamics (Parenting 1) was measured by the adolescent's self-reported response to one question in Wave I. "Do your parents let you make your own decisions about the time you must be home on weekend nights?"

0 = no

1 = yes

Family Dynamics- Measured by Family & Parenting 2

Family Dynamics (Parenting 2) was measured by the adolescent's self-reported response to one question in Wave I. "Do your parents let you make your own decisions about the people you hang around with?"

0 = no

1 = yes

Family Dynamics- Measured by Access to Alcohol in the Home

Access to Alcohol in the Home was measured by the adolescent's self-reported response to one question in Wave I. "Is alcohol easily available to you in your home?"

0 = No

1 = Yes

Family Dynamics- Measured by Access to Drugs in the Home

Access to Drugs in the Home was measured by the adolescent's self-reported response to one question in Wave I. "Are illegal drugs easily available to you in your home?"

0 = No

1 = Yes

Peer Influence- Measured by Peer Alcohol Use

Peer Alcohol Use was measured by the adolescent's self-reported response to one question in Wave I. "Of your 3 best friends, how many drink alcohol at least once a month?"

0=no friends

1=one friend

2=two friends

3=three friends

Peer Influence- Measured by Peer Marijuana Use

Peer Marijuana Use was measured by the adolescent's self-reported response to one question in Wave I. "Of your 3 best friends, how many use marijuana at least once a month?"

0=no friends

1=one friend

2=two friends

3=three friends

School Environment- Measured by School Satisfaction

School Satisfaction was measured by the adolescent's self-reported response to one question in Wave I. "How much do you agree or disagree with the following: If SCHOOL YEAR: You are happy to be at your school. If SUMMER: Last year, you were happy to be at your school."

1=strongly agree

2=agree

3=neither agree nor disagree

4=disagree

5=strongly disagree

School Environment- Measured by School Safety

School Safety was measured by adolescent's self-reported response to one question in Wave I. "How much do you agree or disagree with the following statements: I feel safe in my school."

1=strongly agree

2=agree

3=neither agree nor disagree

4=disagree

5=strongly disagree

Neighborhood Environment- Measured by Neighborhood Satisfaction

Neighborhood Satisfaction was measured by adolescent's self-reported response to one question in Wave I. "On the whole, how happy are you with living in your neighborhood?"

1=not at all

2=very little

3=somewhat

4=quite a bit

5=very much

Neighborhood Environment- Measured by Neighborhood Safety

Neighborhood Safety is measured by adolescent's self-reported response to one question in Wave I. "How much do you agree or disagree with the following statements: I feel safe in my neighborhood."

1=strongly agree

2=agree

3=neither agree nor disagree

4=disagree

5=strongly disagree

VITA

DANA G. FARRELL

EDUCATION

- 2010-2016 Ph.D. Candidate, Public Health
Specialization: Health Promotion & Disease Prevention
Florida International University
Miami, FL
- 2002-2004 M.A., Forensic Psychology
John Jay College of Criminal Justice-CUNY
New York, NY
- 1995-1999 B.A., Justice
American University
Washington, DC
- 2010-2016 McKnight Doctoral Fellow
Florida Education Fund
Tampa, FL
- 2013-2015 Contributing Writer- FIU Student Health 101 Magazine
Florida International University, Miami, FL
- 2012-2015 Program Volunteer & Volunteer Mentor
Girl Power
Liberty City, Miami, FL
- 2013 & 2014 Volunteer Commencement Ambassador
Florida International University, Miami, FL
- 2013-2014 Graduate Research Assistant
Florida International University, Miami, FL
Department of Health Promotion & Disease Prevention
Advisor: Dr. Elena Bastida
- 2003-2004 Supplemental Instruction Leader & Teaching Assistant
John Jay College of Criminal Justice, New York, NY
SEEK Department
Advisor: Dr. Edward Davenport

PUBLICATIONS AND PRESENTATIONS

Farrell, D. (in preparation for submission to the *Journal of Youth and Adolescence*). Risk and protective factors related to adolescent alcohol and other drug (AOD) use: A review of the literature.

Farrell, D., Bastida, E., Beck-Sagué, C., Devieux, J., & Wu, W. (in preparation for submission to the *Journal of Adolescent Health*). Race/ethnicity as an adolescent risk factor for poor adult outcomes: Is alcohol and other drug (AOD) use a mediator?

Farrell, D., Bastida, E., Beck-Sagué, C., Devieux, J., & Wu, W. (in preparation for submission to the *Children and Youth Services Review*). Implications for adolescent risk and protective factors associated with alcohol and other drug (AOD) use and later adult outcomes.

Farrell, D. (February 2016). *Risk and Protective Factors Associated with the Adult Achievement of Substance-Using Adolescents: Findings from the National Longitudinal Study of Adolescent to Adult Health (Proposal)*. Oral Presentation at the 2016 McKnight Doctoral Fellowship Program Mid-Year Research & Writing Conference, Tampa, FL.

Farrell, D. (December 2015). Are you addicted to social media? *Florida International University Student Health 101 Magazine*. 11(4), 7-8.

Farrell, D. (June 2014). Working out even when you feel self-conscious. *Florida International University Student Health 101 Magazine*. 9(10), 5-6.

Farrell, D. (May 2014). Computer love: Safety in online dating. *Florida International University Student Health 101 Magazine*. 9(9), 5-6.

Farrell, D. (February 2014). *The Effects of Tobacco Smoking on Sexual Experience, Sexual Assault, and Dating Violence in Adolescent Girls: Findings from the 2011 Youth Risk Behavior Survey*. Oral Presentation at the 2014 McKnight Doctoral Fellowship Program Mid-Year Research & Writing Conference, Tampa, FL

Farrell, D. (November 2013). 5 tips for a healthy and happy Thanksgiving. *Florida International University Student Health 101 Magazine*. 9(3), 3.

Farrell, D. (February 2013). *High-Risk Sexual Behavior & Alcohol and Other Drug (AOD) Use in Adolescent Girls*. Oral Presentation at the 2013 McKnight Doctoral Fellowship Program Mid-Year Research & Writing Conference, Tampa, FL.

Farrell, D. & Gray, C. (October 2012). *Alcohol and Other Drug (AOD) Use Proximal to Sexual Intercourse in Adolescent Girls: Implications for the Prevention of STIs, Pregnancy and Sexual Assault*. Poster Presentation at the 2012 American Public Health Association meeting, San Francisco, CA.